# A case study of the deployment of cultural probes in remote schools

Konstantinos Chorianopoulos[1], Gerasimos Polymeris[2]

choko@ionio.gr

[1] Department of Informatics, Ionian University, Greece
[2] Directorate of Secondary Education of Ionian Islands, Greece

## Abstract

Cultural probes have emerged as an effective user requirements capturing toolset for sensitive environments, such as domestic and educational settings. Previous efforts with cultural probes have been done on a small scale with no more than 20 users and have mostly considered urban environments. In contrast, we have collected cultural probes from more than ten remote schools and involved more than 100 students and teachers. We have found that some of the original analog probes might be already outdated in the face of contemporary digital tools and technologies, even in places that have remained greatly unaffected by modern life. The results of this study provide a framework for employing, administering, and analyzing cultural probes in longitudinal studies of remote places.

Keywords: cultural probes, remote schools, isolated

## Introduction

In this paper, we present an early study that aims to understand remote schools and establish benchmarks for the performance of the cultural probes methodology. This study is part of a broader research program that investigates the social effects of locative media in an educational setting. Firstly, we collaborated with administrators in education in order to search for potential secondary education schools that wish to participate in this study. The response from schools has been unexpected: More than 80 (eighty) schools have expressed interest to participate and we have selected a dozen of them for an early ethnographic study of their profiles. In particular, we set the following research questions:

- What is the performance and preference for the original analog cultural probes in a remote school?
- How different is a remote school (building, teacher, students) from an (sub-)urban school?

This work is part of a broader empirical study that concerns the introduction of novel Information and Communication Technology (ICT) in primary and secondary education schools. The national ministry of education has already (September 2009) deployed the first round of student laptops for all new secondary education students. Additional rounds of student laptops, as well as novel technologies (tablets, interactive whiteboards) have been planned for the following years. We have realized that both the infrastructure (hardware, software) and the teaching approaches are the same regardless the type of school. Therefore, we aim to track the deployment of novel educational ICT, in order to facilitate, understand and adapt them to particular needs.

Our preliminary work has been focused on the case of the remote schools, which have a different demographic profile to urban schools. Could cultural differences (Ackermann et

al., 2009) require suitable approaches for the introduction of educational ICT (laptops, tablets, interactive whiteboards) in schools? In addition to the research issue of interaction design for marginalized students, we are also concerned about the performance of cultural probes, which have been a very popular technique for gathering user requirements within sensitive environments, such as schools (Wyeth & Diercke, 2006) and living rooms (Oumard et al., 2008). In this paper, we are presenting our methodology and early findings on understanding interaction design with children that live in marginalized geographic areas.

The analysis of the probes is a continuous activity, because the amount of data collected is rather big and most importantly rather unstructured. It has been argued that probes do not lend themselves to any particular method/technique of analysis, but mostly support the design team to put its effort within the context of the users (Gaver et al., 1999). Besides surrounding the designers with completed probes as an inspiration and reminder, affinity diagrams have been a popular open-ended approach for the analysis of ethnographic and qualitative data (Beyer & Holtzblatt, 1999). Nevertheless, previous works have not considered a quantitative aspect of probes. Although cultural probes are inherently qualitative, it might be worthwhile to explore a more statistical approach, such as random sampling of participants and reporting of success rates. We expect that the latter type of reporting might facilitate comparisons between results, since cultural probes have become rather popular in the literature (Boehner et al., 2007).

## Methodology

Our methodology consists of decisions for the: a) number and type of participants, b) number and type of cultural probes, and c) types of cultural probes analysis.

In order to select a set of schools and their postal addresses, we posted an open invitation through the secondary education administration office. The initial reaction of the schools was unexpected. As a matter of fact, more than 80 schools have expressed interest. According to the guidelines of the ministry of education there are many schools that might be considered remote, but many of them might not be really disadvantaged. Therefore, we have found that only 30 (thirty) of them are eligible for our sample. As soon as we had contacted 14 schools, which agreed to participate, we stopped making further contacts and we posted the cultural probes packages.

The content of each probes package included the following materials: a) Disposable analog film camera with flash, b) One 30-page folder, c) Scissors and paper-glue, d) Pens and pencil, e) Post-it notes and tape, f) CDR. The probes packages included a welcome letter and instructions for activities. The translated (from Greek) instructions made the following introduction: 'The above materials could be used for recording the experience of being a teacher and/or student in a remote school. Participating teachers (approximately one up to three) are asked to set-up a group of students (approximately five up to ten) and to work toward recording personal and group experiences in the school. The above materials are indicative, and you are strongly encouraged to use any creative means (e.g., video, digital photos, sounds, collage) that reflects your everyday school experience. In the same way, please use and/or adapt the following indicative activities to your own preferences:'

Finally, we provided the following instruction for the timeline and structure of the activities: "Each student and teacher should record experience for one up-to two weeks in his/her free time. You should use nicknames for each entry."

Although, we have been employing several analysis philosophies and methods (e.g. affinity diagrams, personas), in this paper, we report those results that regard our initial research questions. In particular, we have selected to use a simple table that summarizes the

performance of the cultural probes and of the general reaction of the schools to this user requirements collection method. Moreover, we have employed personas to represent the profile of a remote school in a comprehensive way. Finally, we are providing a few quotes and photos, which might be indicative of the daily life experience. In ongoing work, we have been repurposing a selected set of photos into StoryCubes, which we plan to deploy during a second round of user requirements at the end of a collaboration session between two schools.

## Results

Despite the initial enthusiasm, most schools had been rather slow to receive, process, and return the cultural probes. Most schools confirmed the receipt of the probes after more than a week. On average we received most cultural probes packages back within six weeks, but in two cases, it took more than nine weeks. Notably, only one school returned the probes during the suggested timeframe (two weeks after receipt).

Notably, the travel connection between remote islands (even those belonging to the same group) is usually not possible by public transportation. In addition, we realized that majority of teachers on remote schools rarely stay there for more than a couple of years. The short stay of teachers might be an additional parameter to consider during the introduction of novel ICT. Moreover, the trend of closing down remote schools has been continuing. As a matter of fact, one of the schools in our study has closed down before the beginning of the next school year. Fortunately, the closing of schools is a measure applied mostly to mainland schools, in cases where transfer of students to other villages is feasible.

**Table 1. Summary of the performance of the cultural probes methodology for remote schools**

| Cultural probes | Schools reaction |
|---|---|
| Open invitation | 80 schools |
| Eligible | 30 schools |
| Agreed and submit | 14 schools |
| Returned probes (on time) | 12 schools (1) |
| Average return time | 6 weeks |
| Latest probe return | 10 weeks |
| Never returned anything | 2 schools (one closed down) |
| Popular probe techniques | Photos |
| Other popular probes | Layout of school, diary |
| Ignored probes | Maps, video, collage |
| Unexpected probe | Teachers interview |
| Reasons for dropping-out | Teacher has moved-out |
| Digital probes (photos) | 4 schools |

## Conclusion and ongoing research

At this point of time, the first phase of the project, which regards, a broad user requirements collection and understanding, has been concluded, and the project has moved onto the second phase. So far, two pairs of schools have been selected to continue in the second phase of the project, which regards distant collaboration on a common project. For this purpose, the schools have been asked to choose any project theme that is of mutual interest. Moreover, schools have been asked to use any communication medium for sharing files and coordinating with their remote partners.

In the next phase of the project, we are developing a digital probes system that bridges the gap between the fuzzy approach of analog probes and the rather intrusive approach of an experience sampling system (Consolvo & Walker, 2003). The main benefit of an experience sampling system is that it supports continuous data collection and analysis on specific constructs. The main motivation in the development of such system is that remote schools are by nature rather difficult to reach, support, and monitor. At the same time, the remote schools present a rather sensitive environment (even more than urban schools).

The timing of this particular work is not coincidental: The ministry of education has been already deploying personal laptops for all new secondary education students. Moreover, a wave of novel ICT, such as tablets, interactive whiteboards, as well as ubiquitous systems are planned to be introduced, soon. In summary, we consider the deployment of novel educational ICT both a threat of exclusion (Garzotto & Schelhowe, 2008) and an opportunity for adapting technologies and teaching practice to be inclusive of the needs of remote and isolated schools, which might be an interesting case study in the context of marginalized youth.

## Acknowledgements

## References

Ackermann, E., Decortis, F., Hourcade, J. P., & Schelhowe, H. (2009). Cultural coding and de-coding as ways of participation: digital media for marginalized young people. *Proceedings of the 8th international Conference on interaction Design and Children IDC '09*. (pp. 294-297), ACM Press: New York.

Beyer, H., & Holtzblatt, K. (1999). Contextual design. *Interactions* 6(1), 32-42.

Boehner, K., Vertesi, J., Sengers, P., & Dourish, P. (2007). How HCI interprets the probes. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07)* (pp. 1077-1086), ACM Press: New York.

Consolvo, S., & Walker, M. (2003). Using the experience sampling method to evaluate ubicomp applications. *IEEE Pervasive Computing.* 2(2), 24-31.

Garzotto, F., & Schelhowe, H. (2008). Marginalized young people: inclusion through ICT. *Proceedings of the 7th international Conference on interaction Design and Children* (pp. 101-104), ACM Press: New York

Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: Cultural probes. *Interactions* 6(1), 21-29.

Groth, K., Bogdan, C., Lindquist, S., Räsänen, M., Sandor, O., & Lidskog, T. (2005). Creating a space for increased community feeling among geographically distributed teachers. *Proceedings of the 4th Decennial Conference on Critical Computing: between Sense and Sensibility (CC '05)* (pp. 145-148), ACM Press: New York.

Oumard, M., Mirza, D., Kroy, J., & Chorianopoulos, K. (2008). A cultural probes study on video sharing and social communication on the internet. *Proceedings of the 3rd international Conference on Digital interactive Media in Entertainment and Arts DIMEA '08* (pp. 142-148), ACM Press: New York, NY.

Wyeth, P. & Diercke, C. (2006). Designing cultural probes for children. *Proceedings of the 20th conference of the computer-human interaction special interest group (CHISIG) of Australia on Computer-human interaction: design: activities, artefacts and environments* (pp. 385-388), ACM Press: New York, NY.