Sustainability in Design: Now!

Challenges and Opportunities for Design Research, Education and Practice in the XXI Century

Edited by Fabrizio Ceschin, Carlo Vezzoli and **Jun Zhang**

Proceedings of the
LeNS Conference, Bangalore, India
29th September to 1st October 2010

Volume II

LeNS project funded by the Asia Link Programme, EuropeAid, European Commission

LeNS

ASIA LINK

EUROPE AID
CO-OPERATION OFFICE

Sustainability in Design: Now!

**Challenges and Opportunities for Design Research,
Education and Practice in the XXI Century**

Edited by Fabrizio Ceschin, Carlo Vezzoli and **Jun Zhang**

Proceedings of the
LeNS Conference, Bangalore, India

29ᵗʰ September to 1ˢᵗ October 2010

Volume II

**LeNS project funded by the Asia Link Programme,
EuropeAid, European Commission**

FSC
www.fsc.org
MIX
Paper from
responsible sources
FSC® C013604

DESIGN EDUCATION FOR SUSTAINABILITY (DEfS)

DfS education strategies and curricula development

Filming a new beginning

Prototyping a critical thinking practice with Indian families in Chennai

Anna Keune
Aalto University, School of Art and Design, Media Lab Helsinki, Finland

Brenda Pelayo Castro
Aalto University, School of Art and Design, Art Education, Finland

Teemu Leinonen
Aalto University, School of Art and Design, Media Lab Helsinki, Finland

In this paper we reflect on the design process of the Filming a New Beginning workshop, a critical thinking practice designed with families in Chennai, India, to promote personal growth and individual development through the mobile production of short mobile video films. We consider the workshop and the way it was designed as empowering to raise sustainability inside a community. We highlight identified design opportunities based on challenges and practices found in Chennai, and describe the key lessons learned from testing a pilot workshop, which resulted in the designed workshop. We conclude by providing our future vision of how to understand the impact of the workshop on the family learning culture.

Introduction

The *Filming A New Beginning* (FNB) workshop is a guided activity where individuals first recognize their own position in difficult or uncomfortable situations; second, acquire an understanding of the other persons' motivations and intentions in these situations; and third, ideate alternatives to produce more favourable situations for all. Because individuals are not isolated but live in a socio-cultural environment, a 'do-it-together' approach to create sustainable social practices is fundamental in the critical thinking practice.

The pedagogical foundations of this paper are Paulo Freire's (1970) well-known pedagogy of the oppressed, and the theoretical approach emphasising learning to be a complex socio-cultural process of situated activity to gain understanding and new meanings (Säljö, 1996; Engeström, 1987; Hakkarainen, Järvelä, Lipponen and Lehtinen, 1998; Paavola, Lipponen and Hakkarainen, 2004). In sustainable societies and communities individuals are free to explore, ask why and look for solutions – simultaneously. The individuals have a voice and may improve their living conditions. They are empowered to build sustainable communities with sustainable cultural conventions.

In this paper, critical thinking refers to the inquiry of practical and social situations that a person experiences, leading to the understanding that each individual is a "maker of culture" (Ackermann, Decortis and Hourcade, 2009: 296), and resulting in a behaviour that can make a difference in one's personal life. Because an individual is a "maker of culture" (Ackermann, Decortis and Hourcade, 2009: 296), clear positive changes in personal behaviour through critical thinking may create an effect in a whole family, the community and society. The culture may become sustainable in the broadest meaning of the term.

When looking for lucid and motivating learning methods with critical thinking practices, mobile phone video was selected as a potential learning tool. According to Narayanan (2007: 8) video as a learning tool may "allow for learners to develop their imagination, to be able to play, have fun, and to be able to tell stories in different and exciting ways". Therefore, the technology can be a resolution to move away from a situation where learning is tied to school, and move closer to learning as something that develops individual and personal growth.

During the participatory design research conducted in the Ramapuram village in Chennai, India we identified challenges – based on the Conventions on the Rights of the Child by the United Nations (1989) as universal framework for the development of children – that clearly prevent children from reaching their full potential. We found the children who participated in the study to grow up in an impoverished environment where external objectives dominate their home learning culture. This leads, for instance, to a family culture where physical discipline of the children is common. Further, it was found that immediate livelihood concerns were discussed in front of the children without offering them constructive dialogue. Lastly, we found the omnipresent reluctance to engage with specific social and physical settings to cause an inhibition to critical thinking and empowerment. How these challenges and issues are addressed in the resulting design is discussed in more detail later on.

The FNB workshop presented in this paper is an informal learning practice that aims to serve as an example of how children can develop personal learning strategies, and enter a critical dialogue with everyday practices through digital media design. The underlying practice of the workshop, and the way in which the workshop was designed illustrate a practical aspiration for social sustainability.

Background

Chennai, the capital of the Indian State Tamil Nadu, is composed of village-like neighbourhoods, one of them being Ramapuram. Ramapuram was where the FNB research was conducted from August to December 2009. The village had an estimated population of 30,000 people (Tamil Page, 2010) and was – as Narayanan (2007) has described her study site – neglected, impoverished, and unstable. In her study, Narayanan (2007) concluded that basic human rights like hygiene and health are withheld from the people who live there. The FNB study was conducted with a local non-profit organization, the Pudiyador Association for Community Empowerment (Pudiyador).

Pudiyador is a Tamil expression for 'a new beginning'. The non-profit organization works as an after school centre for children from low-income families. In 2009, Pudiyador supported 35 children between approximately 6 to 14 years of age, with individual care for their personal learning interests. In conversation, Pudiyador's director mentioned that contrary to other learning centres in Chennai, Pudiyador has absence of violence and low monthly fees with attached educational financial plan.

The FNB workshop emerged from a first approach to this community with a project called *NokiaExpand*. The project happened in the context of a study course at the Helsinki University of Technology (currently: Aalto University School of Science and Technology) and was sponsored by Nokia. It aimed at designing a mobile device for learning needs The results included software and industrial design prototypes, and recommendations for further research. The FNB project originated from the authors' personal learning, and is unrelated to the previous project aims and practical results.

Design Practice

Practitioners of participatory design widely see that, even if their backgrounds and areas of concern are so diverse that there can be no single definition of participatory design ("CPSR – What Is Participatory Design?," 2008; Schuler and Clement, 2004), there are issues they agree on. In participatory design, design ideas arise in the collaboration of stakeholders with different backgrounds. Those using or expected to use technology are recognized as the prime source of innovation. Because of this, participatory designers prefer to spend time with people in their everyday life situations rather than test prototypes in laboratories. In participatory design, design challenges are recognized from the real context of people's lives. Neither the challenges nor the solutions should ever be imposed from the outside (Leinonen, Toikkanen and Silfvast, 2008).

Narayanan (2007) identified that people who live in precarious situations in India are largely overlooked when new artefacts are designed. To stop this exclusive design practice, Narayanan (2007) maintains that their practices should be considered in the design process.

The wider methodological approach of the research was based on Freire's 'Pedagogy of the Oppressed', which states that liberating transformation can only happen through practical, dialogical, and

joint participation of individuals intending transformation and the people in the environment under transformation (Freire, 1970: 75, 158).

The FNB workshop was designed with an "intergenerational design team", (Druin, 1999). In addition to the designer (one of the authors) who entered the field from Finland and led the research, the team consisted of ten children, five mothers and two interpreters. The local design team members were involved with Pudiyador, and many lived in Ramapuram. All participants became equal design partners throughout the study.

The kin and friendship relations of the children in Pudiyador were the criteria for asking people to join the design team. The child-participants were between 9 and 13 years old – ages cannot be stated exactly. Of the ten children, six were girls and four boys, all with various educational histories. The five mothers were between 22 and 35 years old, with school education from 0 to 10 years. Most of the children participated regularly in the design meetings, but the mothers participated non-regularly. To overcome the language barrier between the families and the designer, two Pudiyador facilitators joined the design team as interpreters and design partners.

Contextual Inquiry

According to Beyer and Holtzblatt (1998: 46-47) contextual inquiry in design is a planned set of actions where designers inquire and learn by following and participating in the practice of their customers. In the following we describe how the contextual inquiry took place in the study, starting from the first meetings with the design team members to more formal work in common design sessions.

Identifying everyday family activities and meeting spaces

According to Noe (2009: 70) the living environment of a person offers the opportunity to develop. In this study, it was assumed that the living environment of the design team members opened up in different ways to each individual, and understanding their conceptions of it is valuable for the design result.

In the course of two weeks the designer walked with each design team member through their everyday environment, including their homes. During the walks the participants took pictures of their living spaces with mobile camera phones, which were introduced to them before the walks. In a similar way as the photographer Zana Briski (Kids with Cameras, n.d.) taught photography to children to give them a possibility to document their living spaces in the red-light district in Calcutta, the participants of the design team in our case were asked to provide their perception of their environment. Initial doubts about ethical implications of introducing supplementary technology into the environment, were refuted. The design team members were not reluctant to return the technology. Most participants enjoyed the photo activity. Only one participant returned the technology without taking pictures.

The resulting images were printed and shared within the entire design team. In the design team, we discussed topics related to family meeting spaces, shared day-to-day activities between parents and children, and family conversations. We also drew pictures of the situations. The aim of the photo sharing, discussion and drawing sessions was to capture an understanding of the present practices and learning culture between parents and children, to be used in following research and design activities.

## Visualizing the mood of the shared activities

In these design sessions we explored the shared everyday practices of the parents and children further. We recognized and categorized negative and positive experiences, although the activities were sometimes experienced and interpreted differently.

During the design session each participant chose one negative and one positive activity, and created a visualization of each based on personal experiences. For the visual expression we used the printed images and prototyping material available in the environment, such as color pencils, color paper and "pipecleaners", as recommended by other researchers designing with children (Guha, Driun, Chipman, Fails, Simm and Faber, 2004; Montemayor, Druin and Hendler, 2000). During the presentation of the visualizations the participants became aware of a number of challenges, but also recognized enjoyable activities. For example, Figure 1 illustrates 'Playing at home', a negatively experienced activity, and Figure 2 illustrates 'A family discourse', perceived as positive.

Figure 1: Playing at home

Figure 2: A family discourse
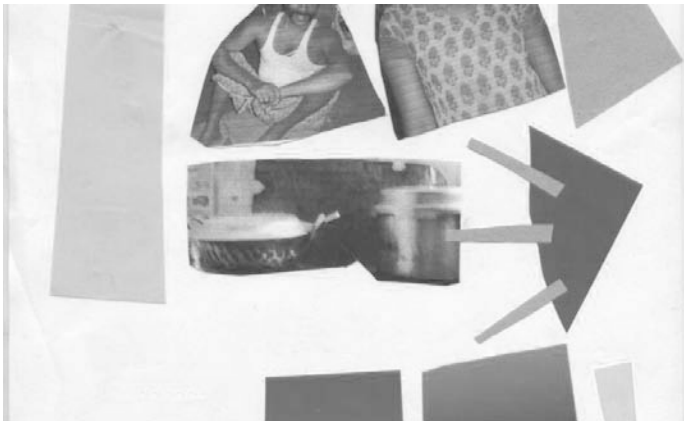
Image theatre

To understand how the shared activities happen in everyday life, we chose to stage them in the design team using image theatre. Image theatre, developed by Boal as part of the "Poetics of the Oppressed", is a form of theatre performed in three stages, focusing on the "feasibility of change" (Boal, 1979: 117). In the first stage, the participants arrange a frozen image with their bodies to visualize the experience of a situation. Then, they stage an "ideal image" of the same situation. Finally, a transitional image is formed, representing how the change could happen. During each stage, the participants can express their values concretely. (Boal 1979: 112-113)

According to Boal (1979: 116), placing oneself in to the scene supports the participants' understanding that they are themselves "part of that reality". In our case it was left to the participants whether to place themselves into the scene, or solely arrange other participants. And unlike Boal's (1979: 112) suggestion, the design team members were allowed to speak while arranging their frozen images. Scenes such as doing homework, playing at home, and gardening were staged, played and discussed.

The design team members did not have earlier theatre experiences. Probably because of this, we were not able to arrange the transitional image. However, the activity served to understand how the participants interpreted everyday activities, and clarified the design team members' values of shared family activities.

Prototyping the workshop concept

The concept of the FNB workshop was ideated in design sessions with the Pudiyador facilitators who were also design team members. The original concept included steps such as choosing a theme, filming everyday experiences related to that theme, viewing, reflecting and re-filming scenes, interviewing people outside of the design team, and showing the resulting films to an audience.

To test the concept we arranged a pilot of the workshop in form of 9 prototyping sessions with 12 design team members. The children and the facilitators participated, but the mothers did not. The sessions

were held daily, and lasted approximately 2 hours each. To enable immediate prototyping of emerging difficulties, the proceeding was open and revised as the workshop went on.

The participants worked within two teams of six persons. One adult joined each team. The teamwork enabled the participants to relate their own experiences to those of other persons, and to ideate suitable representations together.

The pilot gave insight on the practical application of the workshop, and provided more contextual information that was not considered or understood when defining the initial concept. The lessons learned from the pilot workshop were used to define more precise design challenges, and to design the workshop model.

Identified Design Opportunities

During the contextual inquiry, drawing on the Convention on the Rights of the Child and the Human Rights by the United Nations (1948, 1989), we recognized several design challenges preventing the community members, especially the children, from reaching their fullest potential.

For instance, parents and teachers applied physical discipline in the hope of solving fights between children, or to get them to study. Interviews with community members and discussions with design team members illustrated that school was considered as the only stakeholder responsible for learning. Learning at home was dominated by external objectives given by the school and children were often denied to learn or to discover skills by playing. For instance, one child expressed that he did not like to play at home, because his mother would hide his toys and threaten to hit him. In practice, play was considered a waste of time.

Based on the recognized challenges we were able to define design opportunities. These are presented in the following.

Relationship building with a common language

The design team found that the feeling of familiarity reduces inhibitions. Whether it is familiarity with an artefact or with another person, the design team noticed that relationship building is an opportunity for learning free from inhibitions. A relationship means casually knowing something for example another person, but also a domain of knowledge (Papert 1993: 135). When people can converse with each other, by interrogating and sharing their descriptions of the world, there is an opportunity for an effective form of learning (Sharples, Corlett and Westmancott, 2002).

The design team found that a common language between children and adults fosters relationship building and empowers everyone with a voice to speak about their perception of the world. In practice, a common language can be a certain way of talking with each other – a form of dialogue leading to mutual understanding. In the search of a common language, external visual tools can play an important role.

Embedded play

The explorative character of play is beneficial for developing a personal learning strategy. A practice of play, which is shared by the adults and children alike, can help people to communicate. However, because of the stigma among the participants, of play being useless, the practice should not be recognized or titled with the notion of play.

During the contextual inquiry, after gathering information about leisure activities, the design team discovered that, although the learning culture is not inclusive of play, recreational activities are an integral part of a person's life. There was a diversity of storytelling and narrative spaces in the village. Storytelling appeared to be an accepted free time activity by children and adults. We concluded that the element that informs all shared activities is storytelling.

In the design team, we started to call 'play' that is not called play, or even recognized as play by the participants, as 'embedded play'. When designing the FNB workshop we carefully considered how the

activities could include 'embedded play' that is building on and close to the existing storytelling tradition and practices widely accepted by the community.

Practicing change with performance

In order to make a difference, a person has to identify what to change. However, difficult situations are deeply rooted in the day-to-day life of a person, and strenuous to recognize (Illich, 1971: 51). Also, a change of practice needs to be embedded into the mutually established body of knowledge, to become a genuine characteristic of the same.

Performance of everyday life can make personal knowledge explicit. A person can gain insight about what they would like to change and how. Boal (1979: 119) illustrates that theatre can be a "rehearsal for revolution", because the performance of an invented action is a carried out action that can encourage an everyday practice. In communion, difficult situations can be resolved, and change can be practiced.

During the contextual inquiry we notice that performance is seen as opportunity to understand others and to develop empathy. In the design team, we recognized that the performances of everyday life events represented situations that were familiar and close to all participants. The stage and the practices were shared points of origin for all. Performance added to the establishment of a common language between the people, because we saw that staging everyday situations, and sharing them this way with others could help the community members to discuss difficult issues. By documenting the performances we thought to gain a wider audience and an extra layer of reflection for them than in the case of using live theater.

Re-contextualizing technology

Re-contextualizing technology refers to the use of a technical artifact, such as a tool, in a way in which it has not been used before. Discussions with the team members during the contextual inquiry revealed that 5 of the 30 families engaged with Pudiyador activities own camera mobile phones, and that the children use the phones in their everyday life. During the design workshop we thought that joining the camera mobile phones with the already existing narrative practice of families in Chennai, the phones could become tools for embedded play, practicing change and relationship building. With this approach we could operate by not putting the technology into focus, but by looking for ways to mediate and cultivate practices, which are able to empower people with the opportunity to understand that the actions of each individual can shape personal and mutual established realities.

Prototyping the FNB Workshop

The nine sessions of the pilot workshop that we organized with the design team to further test and design the workshop were structured in three types of sessions: five filming sessions, three prototyping sessions, and one screening. The lessons learned from the pilot workshop are described here.

In the filming sessions, the participants filmed everyday situations they intended to change. To identify the situations, the teams filmed the activities of a day until they encountered a difficult situation. From this, we concluded that the workshop should support a slow filming approach.

After watching the initial films, storyboards were created that included ideas of how to better visually represent the scenes. Storyboard development was considered as integral practice of the workshop, because the storyboards supported the decision making during the filming.

In one filming session the teams conducted interviews with shop-owners in Ramapuram, to access their opinions on the theme 'Play in Ramapuram', determined by the design team in advance. However, one team asked the interviewees about their experience of physical discipline by their parents. A debrief with the design team concluded that physical discipline was conceptually linked to play. Further, we found that showing the films to the interviewee before asking the questions could frame the theme of the interview.

During the prototyping sessions, we noticed that unintentionally recorded instructions often caused film dialogue to be inaudible. However, because the instructions included ideas, such as camera angles, film locations, and actor positions that could be applied when re-filming a situation, the instructions only disturbed the final films. We concluded that the FNB workshop should support two modes of filming.

One mode of collecting information, in which instructions can be recorded, and another mode of careful filming, in which instructions can only be given after the filming.

Lastly, the screening session was intended for sharing the children's films with their parents at the centre, but the parents did not follow our invitation. Reasons, such as inaccessibility of the meeting space, impossible schedule coordination, and fear of public exposure based on uncertainty about the film content, were suggested. To make sharing possible for future workshops, the design team ideated a road show scenario, in which the children would show their films to passersby in public spaces and request immediate feedback.

FNB Workshop Designed

The FNB workshop was designed for educators and persons working with children all over the world. During the workshop, difficult everyday situations are identified and favourable situations are practiced in dialogical communion through the creation of mobile video films. The goals are to develop a personal critical thinking practice, and to gain a voice to speak about personally relevant topics by establishing a personal film language. This section describes the FNB workshop as it resulted from the design practices performed in Chennai.

The workshop structure

Figure 3: Timetable of the FNB workshop
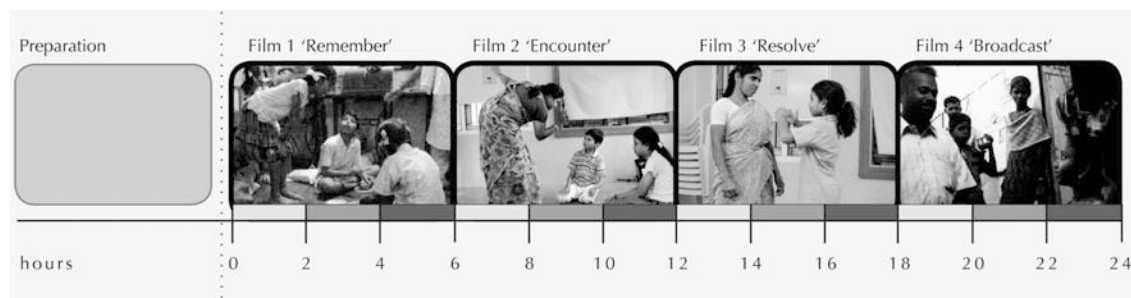
The FNB workshop is structured in a preparation stage, where resources and locations are set, and a practice stage, where participants make four films thematically titled with 'Remember', 'Encounter', 'Resolve', and 'Broadcast'. Each film is created in three steps: 'Access', 'Reflect', and 'Discover'. Excluding the organizing stage, the FNB workshop amounts to twelve steps, and each is recommended to last about 2 hours. The workshop timetable, illustrated in Figure 3, depends on the unique conditions of the environment where it is organized. It is progressively structured during the production. For example, encounters with other persons, referred to as supporting filmmakers, can only be scheduled after difficult situations are identified. The equipment needed to facilitate an FNB workshop is paper, pencils and a video camera, such as a camera mobile phone. No previous film making experience is required. During the workshop participants are referred to as filmmakers, and can freely chose a role, such as film director, actor and cameraperson, as to support their development of a personal film language.

Iterative process: Access – reflect – discover

The content of the films originates from personal everyday situations that the filmmakers detect as problematic. To support the filmmakers in finding their own pace of approaching their films, each film is created in three steps. They are explained in the following.

Access

Here, information is collected and everyday life is investigated with the mobile camera. The camera is used as a virtual sketchbook, and the filmmakers neither need to pay attention to the aesthetics of their films, nor a filming plan. Viewing the films that resulted from collecting the information is a good opportunity to share experiences.

Reflect

In this step, the information is carefully discussed and analyzed. The filmmakers identify the main points of the collected information, and combine several experiences to one story, by organizing scenes in a storyboard. Listening to the learning experiences of the facilitator was found to be a good way to initiate the reflection.

Discover

The storyboards are filmed during this third step. The intended repetition of a reflected problematic helps the filmmakers in their learning process. The camera is used as a medium of expression and not anymore as a sketching tool. The filmmakers develop their personal film language and use their creativity freely. After the filming practices all filmmakers gather to view and discuss the resulting films.

The Four Films of FNB

The four films for the FNB workshop thematically build on one another by following the three-step iteration. Here we illustrate how the three steps relate to the four films.

Film 1 'Remember'

While making this first film, the filmmakers are intended to 'discover' their own positions in difficult everyday situations by filming them from their point of view. The content of this first film directs the focus of the following three films.

To create the first film, the filmmakers 'access' relevant information, then 'reflect' on their own role and identify the difficult situations they want to change, and lastly re-film the selected situations.

Film 2 'Encounter'

'Encounter' means that filmmakers face other people in the situation. All parties from the identified problem are now included in the filming practice, in order to identify different viewpoints of the problematic and understand that many motivations exist in one situations.

First, the 'Remember' films are shown to the supporting filmmakers in a location of their choice. Building on the difficult everyday situations, the filmmakers 'access' the intentions of the other persons, and make them visible by staging and filming them. The filmmakers then 'reflect' on the gathered information, and identify the motivations of the supporting filmmakers. By staging and filming the situation from the perspective of the supporting filmmakers their positions are 'discovered'.

Film 3 'Resolve'

For this film, the filmmakers and the supporting filmmakers practice, stage and film favourable situations together. The filmmakers learn that challenging situations can be transformed with a change of practice.

The 'access' step of the 'Resolve' film consists of viewing and discussing the 'Remember' and 'Encounter' film. Possible resolutions are ideated, during the 'reflect' step. Through filming the ideated change, it is made concrete, which means 'discovered', and the favourable practice becomes accessible.

Film 4 'Broadcast'

The final film is about understanding how realistic the filmmaker's change is for persons who encounter the ideas for the first time.

The filmmakers and the supporting filmmakers present their previous created films to passersby in public places, such as parks or playgrounds, via the camera screen, and 'access' their opinions and com-

ments. To better 'reflect' about the audience's feedback, this interaction can be filmed. Lastly, the filmmakers 'discover' how realistic their resolution was perceived by filming the audience's suggestions.

The FNB workshop closes by viewing all four films, and reflecting about the learning outcome of the workshop.

Conclusion

The design team members considered the FNB workshop to initiate discussions about personally relevant topics, and to establish an atmosphere of change. However, it is too early to evaluate the impact that the FNB workshop has on the family learning culture. In the following, we provide a future vision of how this could be evaluated.

The films resulting from the FNB workshop contain knowledge, for example an ideated resolution, which the filmmakers gained in the course of the workshop. The films serve as mental scaffolds of the 'access-reflect-discovery' iteration that the filmmakers experienced, and can be appropriated as a communication medium, in much the same way as words. The films are accessible to the filmmakers, in the widest sense through their memory of the workshop. For example, during the contextual inquiry, the designer gifted a printed photograph of the frozen image 'Playing at home' to the family members who staged this scene. When returning to the family a few days later, the mother reported that when she was about to physically punish the child for playing, the child would present the photograph to her, and she would refrain. The child said that a family joke developed around this everyday situation.

Studying the appropriation of the films in everyday family life after an FNB workshop could serve to identify the kind of impact the ideated resolutions have on the family life, and could shed light on the role of the digital artefact in social transformation.

Furthermore, we consider the FNB workshop to be a practice capable of being utilized by any person. It is our intention to identify communities for which the FNB workshop could be a valuable practice.

Bibliography

Ackermann, E., Decortis, F., Hourcade, J. P. and Schelhowe, H. (2009) 'Cultural coding and de-coding as ways of participation: digital media for marginalized young people', In *Proceedings of the 8th International Conference on Interaction Design and Children*, Como: Italy. New York: ACM, pp. 294 – 296.

Boal, A. (1979) Theatre of the Oppressed, 2nd edition, London: Pluto Press.

Druin, A. (1999) 'Cooperative inquiry: developing new technologies for children with children', *SIGCHI Conference on Human Factors in Computing Systems*, Pittsburgh, PA. New York, NY: ACM Press, pp. 592 – 599.

Engeström, Y. (1987) *Learning by expanding*, Helsinki: Orienta-Konsultit Oy.

Freire, P. (1970) *Pedagogy of the Oppressed*, 2nd edition, London: Penguin Books.

General Assembly of the United Nations (1948) The Universal Declaration of Human Rights, [Online], Available: http://www.un.org/en/documents/udhr/ [09 July 2010]

General Assembly of the United Nations (1989) The Convention on the Rights of the Child, [Online], Available: http://www.un.org/documents/ga/res/44/a44r025.htm [09 July 2010]

Guha, M. L., Druin, A., Chipman, G., Fails, J. A., Simms, S., and Farber, A. (2004) 'Mixing Ideas: A New Technique for Working with Young Children as Design Partners' *In: Interaction Design and Children*, College Park, MD. New York, NY: ACM, 35 – 42.

Hakkarainen, K., Järvelä, S., Lipponen, L., and Lehtinen, E. (1998) 'Culture of collaboration in computer- supported learning: Finnish perspectives', *Journal of Interactive Learning Research*, vol. 9, pp. 271-287.

Illich, I. (1971) *Deschooling Society*, 3rd edition, London: Marion Boyars.

Kids With Cameras *About the film*, [Online], Available: http://kids-with-cameras.org/bornintobrothels/ [09 July 2010].

Leinonen, T., Toikkanen, T. and Silfvast, K. (2008) Software as Hypothesis: Research-Based Design Methodology. In The proceedings of Participatory Design Conference 2008. Presented at the Participatory Design Conference, PDC 2008, Indiana University, Bloomington, IN, USA: ACM.

Montemayor, J., Druin, A. and Hendler, J. (2000) 'PETS: A Personal Electronic Teller of Stories', in Druin, A. and Hendler, J. (ed.) *Robots for Kids: Exploring New Technologies for Learning*, San Francisco: Morgan Kaufmann.

Noe, A. (2009) *Out of our Heads, Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness*, New York: Hill and Wang.

Narayanan, G. (2007) A Dangerous but Powerful Idea – Counter Acceleration and Speed with Slowness and Wholeness, [Online], Available: http://kt.flexiblelearning.net.au/tkt2007/edition-13/narayaran/ [09 July 2010].

Paavola, S., Lipponen, L. and Hakkarainen, K. (2004) 'Models of innovative knowledge communities and three metaphors of learning', *Review of Educational Research*, vol. 74, no. 4, p. 557.

Papert, S. (1993) *The Children's Machine: Rethinking School in the Age of the Computer,* New York: HarperCollins.

Sharples, M., Corlett, D. and Westmancott, O. (2002) 'The Design and Implementation of a Mobile Learning Resource', *Personal Ubiquitous Computing*, vol. 6, no. 3, pp. 220-234.

Säljö, R. (1996) 'Mental and physical artifacts in cognitive practices', in Reimann, P. and Spada, H. (ed) *Learning in humans and machines: towards an interdisciplinary learning science*, Pergamon.

Tamil Page (2010) *Tamil Nadu Places*, [Online], Available: http://www.tamil-page.com/city_detail.php?pincode=629303&city=Ramapuram%A0&district=kanyakumari&state=Tamil%20Nadu [09 July 2010].

About the authors

Anna Keune is a master student at the Aalto University School of Art and Design. Anna holds a minor degree in International Design Business Management, and was an exchange student at the Srishti School of Art, Design and Technology in 2009. She has a Joined European Bachelor degree in Media Production from the University of Applied Sciences, Darmstadt (h_Da) and the Cork Institute of Technology (CIT). Anna is an active board member of Aalto Social Impact, an association connecting individuals from various fields working on social transformation through design, technology and business.

Brenda Pelayo Castro is a postgraduate student at the Aalto University, School of Art and Design, in the field of Art Education. Brenda holds an MA degree in New Media from the former University of Art and Design Helsinki, now part of Aalto. She has worked for over 6 years in several learning-related projects as graphic, interaction, and concept designer. Brenda has experience in research and development as visual designer and user experience designer of mobile, web, and desktop interfaces. Since 2007, Brenda has been working as Graphic and Interaction designer of future mobile interfaces at Nokia Research Center.

Teemu Leinonen is a professor of New Media Design and Learning at the Aalto University School of Art and Design. Teemu holds over a decade of experience in the field of design, research and development of web-based learning. Since 1998 Teemu has led the Learning Environments research group of the Media Lab at the Aalto University. Teemu conducts research, design, and publishes in different forums. He has delivered a number of speeches in national and international conferences, has given in-service courses for teachers and carried out consulting and concept design for several ICT and media companies.

Acknowledgement

Acknowledgements

Paper Review Panel

- Vasanthi Dass (Srishti School of Art, Design & Technology, India)
- Wang Guosheng (Tsinghua University, China)
- Yrjo Sotamaa (Tongji University, China)

Conference Organizing Committee

Politecnico di Milano
- Carlo Vezzoli
- Fabrizio Ceschin
- Jun Zhang
- Sara Cortesi

Srishti School of Art Design & Technology
- Geetha Narayanan
- Mary Jacob
- Deepta Sateesh
- Ajai Narendran
- Divya Cherian
- Meena Vari

Aalto University
- Eija Nieminen
- Cindy Kohtala
- Aila Laakso
- Tatu Marttila

Other LeNS partners cooperating with the organisation

Delft University of Technology
- Jan Carel Diehl
- Duygu Keskin
- Marcel Crul

Indian Institute of Technology
- Amrit Srinivasan

Mongkut's Institute of Technology Ladkrabang
- Sompit Moi Fusakul
- Praoranuj Ann Siridej
- Pwinn Rujikietkhumjron

Tsinghua University, Academy of Arts and Design
- Cai Jun
- Liu Xin
- Liu Guanzhong