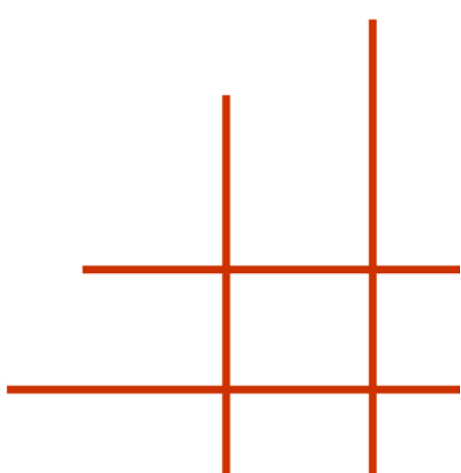international reports
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Challenges of an Educational ICT Intervention:

*The Establishment of a
MediaSpace in the High Atlas*

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Challenges of an Educational ICT Intervention: The Establishment of a MediaSpace in the High Atlas

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Abstract. This paper describes the challenges which were faced by establishing a MediaSpace in the High Atlas in Morocco. The focus lies on the adaption of the well-established computer club approach within a steadily developing and profoundly transforming rural/mountainous region. This paper presents different aspects during the establishment process and contrasts these experiences with two other studies in different contexts, on the one hand inhabitants of refugee camps in Palestine and on the other hand, socially marginalized migrants in Germany. Findings show the importance of understanding the local context, involving local partners and integrating the needs and requirements of the local population to establish a sustainable intervention.

1 Introduction

All over the world, we can observe how the digitalization is penetrating every area of our life. Information and Communication Technologies (ICT) is ubiquitous and influences the health sector (e.g. (Müller et al. 2012; Ogonowski et al. 2016)), how activists are organizing their political agenda and demonstration all over the world (e.g. (Wulf et al. 2013a, b; Rohde et al. 2016)), supporting the resettlement

process of refugees in their host countries (Baranoff et al. 2015; Xu et al. 2015) and empowering girls and women in rural areas (e.g. (Aal et al. 2015a; Hoan et al. 2016)).

Especially the integration of technological innovations into the area of education has provided several benefits (e.g. (Aal et al. 2015a; Ahmed et al. 2015; Ndaiga and Salim 2015; Stickel et al. 2015)). This is also true for developmental areas (ICT4D, ICTD) and developing communities, where ICT can provide access to education material and online courses (Dias et al. 2005; Ahmed et al. 2015). ICTs have been globally accepted as a component of education that has the ability to enhance and develop skills that youth need to participate and be successful in the modern economy.

Although (uninformed) presuppositions about a 'not yet modern' Africa (especially in contrast to the 'West' which is perceived as 'modern') might still be prevalent in 'western' societies, Morocco, in fact, belongs to the African countries with relatively widespread mobile connectivity and high levels of mobile ownership (Kingdom of Morocco 2008). In Marrakech, there is a CyberPark, and also in other cities many public squares or places have free Wi-Fi network. In almost all cafés or restaurants you can access Wi-Fi or ask the staff to charge your phone. In the rural areas, you might not find landlines, sometimes not even electricity or running water, but often excellent LTE or 3G network coverage.

This paper describes an educational ICT intervention in a similarly contradictory setting; that is, within a steadily developing and profoundly transforming mountainous region of the High Atlas.

The following paragraphs will cover the underlying concept of the computer club and the changes, which were made to adapt the concept to the specific case in the High Atlas. And the challenges we experience during our fieldwork while establishing the MediaSpace.

2 State of the Art

For our line of research, we need to investigate the current state of the art regarding educational ICT-initiatives for development and computer cubs.

2.1 Educational ICT-Initiatives for Development

An emerging direction of research in Human-Computer-Interaction (HCI) focuses specifically on the current situation with refugees their use of ICT and how ICT can support them (e.g. (Harney 2013; Baranoff et al. 2015)). Studies have shown that both smart and feature phones are commonly used among refugees (Baranoff et al. 2015; Xu et al. 2015). Digital storytelling and role playing have been used for refugees to creatively express themselves (Sawhney 2009) and to enhance their intercultural empathy when entering schools (Aylett et al. 2009). Fisher et al

worked with Syrian refugee youth in the Za'atari camp, exploring their technology needs, information problems and limited access to education in a youth-focused co-design approach, also showing how youth plays a key role in helping others (Fisher et al. 2016).

Providing ICT as means to foster local technology and entrepreneurship communities was the main focus of technology hubs, which opened in several countries in Africa. Zegura and Grinter (2013) examined important factors in low-resource settings and highlight the importance of an individual local member as 'community manager' (Zegura and Grinter 2013). Various studies focus on the potential of mobile phones in rural areas, which open a vast space of opportunities for various forms of learning and offer users access to vocabularies, registers, styles and genres (Wang et al. 2005; Leppänen and Piirainen-Marsh 2009). A randomized study by Aker et al. (2012) showed that a simple education program for adults on a mobile phone lead to higher scores in standardized test compared to non-users (Aker et al. 2012). Another approach was formulated by Gaikwad et al. (2010), who explored the potential of TV-DVDs as substitute for expensive computers in the display of PowerPoint teaching aids (Gaikwad et al. 2010).

One of the few studies, which engage with the ICT usage of Amazigh was conducted by Dodson et al. (2013). In their work, they endeavour to understand the utility gaps of mobile phone usage with low-literate Amazigh[1]-Muslim women in a predominantly oral-language community (Dodson et al. 2013). The majority of the research about Amazigh was conducted in the field of Anthropology. Gellner (1969) examined in his ethnographic work about the Imazighen of the High Atlas their political organization by foregrounding the role and importance of religious leaders for their daily life (Gellner 1969). While Crawford and Hoffman (2000) focus on the changing style of life of Imazighen in a rapidly changing world (Crawford and Hoffman 2000).

The research presented in this paper fits to the larger body of research that explores the influence of ICT on education in developmental regions. However, there are no studies which deal with educational ICT-interventions supporting learning and community building under the specific conditions of Imazighen in rural areas, especially in the High Atlas.

2.2 Computer Clubs

The computer club concept in Germany is inspired by the computer clubhouse approach established in Boston in 1993 (Resnick et al. 1998). The original clubhouse is built around the idea, that children and young adults learn by designing and building personally meaningful artefacts. The clubhouse model has

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[1] In this paper the authors use the terms ‚Amazigh' (singular) and ‚Imazighen' (plural) as mainly used by activists in the linguistic and cultural rights movement, instead of the term ‚Berber'. Still, there is an ongoing scholarly discussion about the use and connotations of terms (Crawford and Hoffman 2000).

grown to a worldwide network with over 100 active community centers across 20 countries (more details can be found in (Resnick et al. 1998; Michalchik et al. 2008; Kafai et al. 2009)).

In the last decade, six computer clubs were opened in different cities in Germany. The underlying concept is inspired by the computer clubhouse idea but follows a different approach by focusing on cross-cultural and intergenerational interactions by its participants. Three of them are established in school contexts, the others in social institutions with a strong focus on migrants and refugees. This intercultural learning environments were built to foster learning, cross-cultural understanding, respect in culturally and socially diverse neighbourhoods and providing access to ICT and other maker technologies, such as 3D printer and e-textiles (Stevens et al. 2005; Schubert et al. 2011; Aal et al. 2015a).

Participants meet once every week and conduct various projects by using more or less different kinds of technology (Rode et al. 2015). These project range from creating games using Scratch (Maloney et al. 2010) over 3D-printing (Stickel et al. 2015) to upcycling projects using garbage. Especially with migrants, different topics regarding integration in Germany came up during the computer club sessions (e.g. writing CVs, guidelines how to find an apartment or learning the German language).

In a second step, two computer clubs were founded in Palestinian refugee camps. These camps were established in 1948, when the state of Israel was founded and since then, they have been receiving humanitarian services from the United Nations Relief and Works Agency (UNWRA) and other NGOs, but the state of isolation, exclusion and poverty among the population living in the refugee camps is until today ubiquitous. Inhabitants of the camps are seen as Palestinians with differences in behaviour, morals, values and also attitudes. Based on this, refugee camps are regarded as hostile places (Aal et al. 2014).

Until today, one of the clubs is still running and provides a safe place for camp inhabitants to access ICT and learn related skills. The computer club is part of a children's center in al A'mari refugee camp in Al Bireh, close to Ramallah in the West Bank. Every week, student volunteers from the university nearby are conducting sessions with children and offer a vision of a life outside the camp for camp inhabitants especially children (Aal et al. 2015b, 2016; Yerousis et al. 2015).

The computer club concept aims to empower the participants to work with technology in a more productive and a less consuming way. Further, the idea is to "teach" the participants to see computers and technology as a useful tool so they will integrate it in their everyday life.

The concept of the MediaSpace extends the computer club approach. On the one side, it is the place where the computer club sessions are hosted but on the other side it also offers open sessions for visitors where they can try out current ICT technologies for their private projects.

3 Methodology

The main methodological framing in this research project is based on the participatory action research approach (PAR) (Kemmis and McTaggart 2005). By being part of the intervention, the researchers tried to understand the local situation, infrastructure, problems and various actors. It uses mainly observational, qualitative methods which are completed by informal interviews.

Six of the authors visited the valley to understand the local situation, find partners and establish the MediaSpace. In a first phase in beginning of 2016, one author travelled to the valley to explore the potential of a MediaSpace in this area. Following this visit, two authors spend together three weeks to contact local authorities and NGOs and explain the idea of the intervention. Another six-week stay at the end of 2016 was executed to establish trust and convince the local population that the researcher is not a tourist, but someone who is going to conduct an intervention, which is helpful for the inhabitants. The last visit was at the beginning of 2017, after several months of preparation three of the authors opened the MediaSpace and trained the tutors and attended the first sessions. In total, the authors spend 14 weeks on the field site. Over all the phases, field notes were written every evening, where the authors describe their experiences and impressions of the day related to various topics such as political power distribution, gender issues and ICT usage.

One of the authors, an anthropologist, stays in the field for several months to observe how the local population will make sense of the MediaSpace and use the different provided tools. He learned Arabic and also the local language, Tamazight, to interact with the inhabitants of the valley.

During this research, a combination of researchers with a broader technological background and researcher with an ethnographic background work together to not only conduct the intervention mutually, but also to observe how the (technological) researcher behave and interact during the intervention.

4 Research Setting

The Kingdom of Morocco is a constitutional monarchy with an elected parliament. The current Moroccan royal family belongs to the Alawite Dynasty, which dates back to the 17th century. Over the past centuries different colonial powers conquered Morocco. In 1860 Spain occupied northern Morocco, in 1912 the French imposed a protectorate over the country. After a protracted struggle, Morocco celebrated its independence in 1956. The current monarch's grandfather, Mohammed V, organized the new state as constitutional monarchy and in 1957 proclaimed the title of king (CIA).

The current king, Mohammed VI, who is also called "the king of the people", responded to the pro-democracy protests in the region (Lotan et al. 2011; Wulf et al. 2013b; Rohde et al. 2016) by changing the current governmental form and including a new constitution, under which some power was extended to the parliament and the prime minister, but ultimate authority still remains in the hand of the monarch. Morocco held its first ever direct elections for regional councils in September 2015, as promised in one of the reforms in the 2011 constitution (CIA).

Arabs and Imazighen make together 99,1% of the Moroccan population (CIA); while Imazighen are living in this region for several thousand years (Canada: Immigration and Refugee Board of Canada; Encyclopædia Britannica) and are referred to as the indigenous people of the region. Nearly all of them converted to the Islamic belief (CIA). The process of assimilation began with the seventh century Arab invasion and took place mostly in the cities and coastal regions. The majority of the rural population in Morocco is Amazigh, as are most of the poor (UNHCR). Imazighen are estimated with around 30-40 % of the whole population, although reliable numbers are difficult to find.

The earlier dichotomy between 'Arabs' and 'Imazighen', according to which Arabs were connected with being rather wealthy and living in the urban areas, whereas Imazighen as being poor and mainly living in the rural areas, has been challenged. Crawford remarks that Imazighen "do not only exist in rural areas, but in all of Morocco's cities and all social classes" (Crawford 2008). In recent years linguistic and cultural right movements grew that aimed at reviving and promoting the Amazigh cultural heritage. The main language (Tamazight) was not recognized as official language until 2011 (UNHCR).

Still, it has to be noted that there exists a considerably contrast between the urban and rural areas in Morocco. Especially the more remote mountainous regions are in great part lacking basic infrastructures or medical care, but also often access to job opportunities or education. Those regions are primarily inhabited by Imazighen. Additionally, in those parts of the country most of the women are illiterate. Around 60% of women (in the whole country) cannot read and write (NationMaster), official numbers for female Imazighen are not available, but in (informal) talks with inhabitants of the valley it was stated, that the majority of female Imazighen above the age of 18 is illiterate (Dodson et al. 2013; Slawson 2016). In contrast to the rural male Amazigh population, most of the women also mainly speak Tamazight and only rudimental or not at all Moroccan Arabic (Hoffman 2008).

The valley we chose to work with is located in the High Atlas and about 80km south-west of the city Azilal, which at the same time hosts the municipality of the province. The valley is divided into six smaller villages and has in total around 10.000 inhabitants (Imazighen). According to oral tradition the oldest village was

founded by the end of the 14th century. The whole region looks back on a rich socio-cultural history and significant religious tradition.

Most households in the valley are living from agriculture and pastoralism, including transhumance, which means that people are moving their livestock seasonally to pastures on the higher plateaus surrounding the valley. In addition, men are working in the local administration, construction or tourism, others left the valley as labor migrants to bigger cities.

Figure 1: The valley in the High Atlas

The division of labour in the valley is generally distinctly gendered, albeit there are some minor exceptions. In agriculture, for instance, there are certain tasks only done by man (like ploughing) and others only by women (like pulling up weeds). Furthermore, women are responsible for the housework and house: they wash the laundry at the river, collect wood for the oven, cook the meal, clean the house and are looking after the children and the house.

The region is subject to a profound change. Since the mid-2000s important infrastructural improvements and development took place. Households in the main villages now have access to running water and electricity. Before, people had to get water from the nearby river and had to rely on turbines and candles. With the establishment of electricity, the use of satellite television spread among the households. The major road to and from the valley was paved, a small health center including two nurses and three ambulance cars were introduced. A big telecommunications company built a set of telephone pole that now provide LTE network all over the valley. However, one of the main villages still cannot be reached by car, but only by foot and with donkeys. A new school was built three

years ago, which – as an informant told us – is a major improvement. As a consequence an increasing number of people from more remote settlements are now deciding to settle in the main villages.

The transformations are accompanied by an increasing activity of NGOs in the valley. There exists a number of different associations, most of all local ones and mostly concerning agriculture, tourism or cultural heritage. One very active NGO that is doing community work started in cooperation with a French association in the beginning of the 2000s. It later continued its work with focus on communal infrastructure projects independently and can draw on broad support among the local population, as itself consists only of locals. Since 2009 also an American NGO started to work with the local population and the mentioned local NGO in order to restore cultural heritage sights and further improve the living conditions. To achieve this goal, besides fundraising, they invite students from the US to work with the inhabitants on different sustainable projects such as garbage incineration, make better use of the planting area in the different seasons, build a wash system at the river or providing additional after school education with local teachers who speak the language of the Imazighen.

5 Findings

This chapter presents the findings and results related to different dimensions and aspects of the conducted work during the last two years.

5.1 Collaboration with local Partners for Sustainability

During the first trip, the necessity of collaboration with local institutions came up early to gain trust and acceptance in the community. The MediaSpace was established in cooperation with a very active local NGO which focuses on improving infrastructures in the valley, hosting cultural activities, empowers women and supports children in their school career. This NGO works in the valley for the past 13 years and enjoys the trust of community, because of its up to now much appreciated community work and because its members descend from the valley itself. Hence, they are an integral part of the community itself and have available crucial knowledge of helpful social relations and about necessities as well as concerns among the locals. The collaboration with the local partners also enabled us to gradually develop a better understanding of the specific situation and setting – still an ongoing process.

5.2 Understanding the local Situation

That the local situation was complex and perhaps even more complicated than initially expected, became clear right from the start, especially after the first

exploration. In order to create a successful intervention and to establish the MediaSpace without going over someone's head (in other words, preventing conflicts and picking up on potential partners' needs and suggestions) it was necessary to examine very closely the political organization and prevalent power structures that are inseparably embedded in a specific socio-cultural context. The researchers aimed at an understanding as holistic as possible, which meant on the one hand to consider carefully the historical and religious background of the region, and on the other hand to get an idea of the peoples' everyday practices in situ. Repeated and extended explorations as well as the consultation of ethnographic literature proved as absolutely essential. Moreover, it is an ongoing process, as the anthropologist is still in the field up until now.

The power relations and thus aspects of the political organization in the valley, to give a brief overview, can be understood along mainly four distinct, but nonetheless intertwined entities. Firstly, there is an administrative body whose officials are more or less appointed directly by the king. Secondly, there is another administrative body where in contrast the officials are elected representatives. Thirdly, there exists a more traditional form of political organization (tribe and sheikh), for which the specific Moroccan Islam plays a crucial part. It has to be understood by its historical importance and as part of culture. Fourthly, the NGOs with their different projects and interests are an important aspect. They occupy a strategic intermediate position between local community, administration and own goals. With so many different actors and interests on the ground, the researchers wanted to prevent to create conflicts by their own sudden appearance. Especially through winning the local NGO as partner the researchers could establish access to the field. Because of the cooperation with the NGO it was possible to develop good communicative basis with all different actors involved.

The language barrier was another main issue. In that specific area, the people's mother language is Tamazight, most of men speak the Moroccan Arabic dialect and some also French. But most of the women are only able to speak the Tamazight language, starting a conversation with and reaching out to them was hard or impossible. In the main school in the valley, children immediately start learning Arabic since the teachers are assigned to only speak in that language. Children start learning English and French at 6th grade.

5.3 Setting up the Infrastructure

One of the first challenges we encountered, were the specific requirements of the High Atlas. There was no room available, where the MediaSpace could be hosted or the provided hardware could be stored. So, in cooperation with the local partner, the decision was made to build a new house with a room, that would fit the needs of the MediaSpace. It is located right next to the tutoring center and close to the local school. It contains enough space to set up tables in different arrangements, has empty space on walls to hang boards, pictures or posters and as

many wall sockets as possible. Another issue was the limited access to Internet. Usually, people use prepaid cards from national providers such as Orange or Maroc Telecom. Orange has the monopoly on the good quality mobile internet in the valley, but there is no landline available and the prepaid cards have limited data capacity, which is not sufficient for the requirements of the MediaSpace. As possible solution, the Internet will be provided via satellite.

5.4 Training of the Tutors

After deciding who will manage the MediaSpace, maintain the technology and tutor the participants, the tutors needed a tutoring themselves. Two men from the valley stated they wanted to take ownership of the Space even though, they are not well trained or familiar with technology itself. So, before they could start with conducting sessions, they had to learn the basic knowledge in handling a computer and different tools, which are important to support participants during the project work.

Moreover, they first needed to understand the MediaSpace and the computer club concept in particular as an open, informal learning space. One of the tutors is working as teacher in the tutoring center, so he used to teacher-centered teaching. The second tutor has no prior experience with teaching or tutoring, but was eager to learn how to use a computer and lead computer club sessions.

Figure 2: Training of the Tutors

5.5 Identifying the people's needs

The concept of the computer club and MediaSpace builds upon the participants' needs, who are then internally motivation to engage in projects and fulfil them. By conducting informal interviews (which were more or less regular conversations, since we didn't mean to interrogate them), we tried to find out their personal, wishes and needs for the specific space. People living there have a greater understanding of the needs of their communities. By collaborating with locals and local NGOs these needs can be identified and addressed.

5.6 ICT-Literacy

The observed ICT-Literacy among Imazighen was very low. Older adults in the valley are only exposed to television for five to ten years; even children and young adults are not familiar with the usage of computers, tablets or smartphones. Although a significantly increasing number of older children and adults are now using smartphones only few know about a bit more ambitious settings. Even the few inhabitants with a university degree didn't know the basic knowledge of how to interact with a computer (e.g. copy-and-paste, right-click on a computer mouse or even know how to handle a computer mouse). This was also one of the first issues, which was encountered during the computer club sessions with children. For the majority of the young participants it was the first time to interact with a laptop or ICT in general. The tutors had to teach them, what a desktop is, how they can use folders and how to use the keyboard and the computer mouse. In informal interviews with well-connected members of the local NGO, concerns about the usage of mobile phones and access to the Internet were raised. From their perspective, young adults use the Internet only to watch videos on YouTube or pornography.

5.7 ICT-Access

Despite the wider distribution of smartphones the overall ICT-access was very low. There was only one room with older computers in the whole valley, but this room was not available for everybody. It was only used by the local NGO, which was also the partner for the MediaSpace, who provided access to students and children for conducting research. Usually, only wealthier inhabitants possess a laptop or tablet and also know how to handle it. These people work for the government or with tourists, who are willing to pay a high amount of money.

Figure 3: Computer Club Session

6 Discussion

6.1 Collaboration with local Partners for Sustainability

In Germany, the computer clubs are established in the school framework. The access to children and their parents is given naturally, also the spatial infrastructure. In every session, there is a teacher accompanying the tutors (Schubert et al. 2011). While in Palestine, the computer club is established in a youth center in the al-A'mari refugee camp. Usually, there is one local coordinator and volunteers from the Birzeit University who conduct the weekly sessions. This activity is part of the community service program which every student in the university has to take part in (Yerousis et al. 2015).

The first idea for the Moroccan ICT-intervention was to establish the MediaSpace at the local school, which is built by the government. The teachers are also employed by the government and have in most of the cases Arabic background. In informal talks, the inhabitants living in the valley showed restraints to host the MediaSpace at the local school. Access and outreach to other possible participants would be limited and only children visiting the school would profit.

6.2 Understanding the local situation

The Palestinian society is characterized by a distinction in 'regular' citizens and refugees. Observation and interviews showed, that even though people who have a refugee background but whose families have moved out of the camp years and generations ago, are still seen as a refugee and are treated that way (Yerousis et al. 2015). The refugee camps are perceived as dangerous places, working without a local NGO would not be possible, since outsiders are not always welcome in the camp (Aal et al. 2015b).

In Germany and especially in the last four years, there is a huge 'wave' of refugees (Al Jazeera 2016). On one side, attacks and political statements against refugees have increased. But on the other side, many people are getting involved in integration initiatives (Al Jazeera 2016) and foster the welcoming culture (The Guardian 2015). Refugees and migrants have special requirements and needs, which were addressed in the computer club session (Almohamed and Vyas 2016). These circumstances need to be reflected during the establishment of the intervention (Aal et al. 2014, 2016; Yerousis et al. 2015). The Moroccan MediaSpace is embedded in a very complex political situation, working with a local NGO ensures the trust of the different parties.

6.3 Setting up the Infrastructure

The set-up of the MediaSpace was comparable to the computer club in Palestine, which also was built from scratch. Laptops and other tools needed to be built inside an empty room of the youth center, Internet access was provided by the father of a participant, who works for a local Internet provider. The German computer clubs built on the existing infrastructure in schools and use open source technologies to undertake the projects. For Morocco, the majority of the technology was imported from Germany, because the tools and devices were not available in Morocco. The local NGO also stated, that the devices, which one could buy in Morocco don't have the same level of quality compared to Germany. Another possible issue was theft, even when the community members trust each other, the locals suggested to build a lockable cabinet, where only the tutors and members of the NGO have access to.

6.4 Training of the Tutors

Working with teachers, who acted later on as tutors, was also a challenge in Germany and Palestine. Most of them are used to the teacher-centered teaching and need to understand the informal education environment of the computer clubs (Aal et al. 2014). Especially in the Arabic countries, the teacher is the authority in the classroom and children usually don't defy them. The computer club approach

fosters the intergenerational exchange of ideas; everybody is a learner during the session (Weibert and Wulf 2010; Schubert et al. 2011).

6.5 Identifying the people's needs

In Germany, many migrant women are joining the weekly session. One of their main interests are to find a job or an apartment. So, integrating sessions about how to write a CV and a letter to a possible future landlord evolved naturally. The MediaSpace has just been opened, but first projects circle around the daily work in agriculture, education and tourism (Velghe 2013). Tour guides used the equipment of the computer club to create and update their Facebook pages and produce videos of the hiking opportunities in the mountains; teachers want to integrate computers in their lessons. The MediaSpace can be understood as a new resource for education.

6.6 ICT-Literacy

The low ICT-literacy could be observed in the German and Palestinian computer clubs, where ICT-access is available, but most of the participants are only consuming content (Rode et al. 2015). In the Palestinian case, the computer club was a substitute for the local school, when it was on strike. The amount of children, who wanted to attend the computer club session was too much to be handled by the student volunteers (Yerousis et al. 2015). A similar observation could be made in the Moroccan valley, when too many children showed up for the first session. The wish to learn how to use ICT is particularly high in developing areas (Lopez et al. 2015; Stickel et al. 2015).

6.7 ICT-Access

Mobile phones are the easiest and cheapest way to connect to the global community (Wang et al. 2005; Aker et al. 2012; Hoan et al. 2016). Even with the high level of mobile ownership in Morocco (Leppänen and Piirainen-Marsh 2009), Imazighen still lacking access to devices such as mobile phones with Internet access or laptops and tablets. The MediaSpace offers access to current ICT technologies and also provides help to learn how to use them. This case is comparable to the German computer clubs at the beginning in 2004, which were the only place for migrants to access the Internet and learn to handle computers (Stevens et al. 2003).

7 Conclusion

It can be said, that the growing demand for technological innovation to enable empowerment of developing communities requires new and creative educational initiatives. The presented study provides insights from an ICT-intervention which addresses the demand for the technological improvement.

For the first time in the valley, ICT and technology in general are being set in an educational environment through the MediaSpace. Indeed, students and children already used smartphones, but mainly for communicating, chatting or entertainment. The MediaSpace with its rather institutionalized setting is a place where the inhabitants can attend open sessions to try out and learn more about current ICT technologies – beyond the known aspects.

This paper showed the complex establishment process and described the various circumstances which need to be addressed to successfully adapt the ICT-intervention in the socio-technical context of the Imazighen living in the High Atlas. Various members of the German project team spent substantial amounts of time in understanding the local context, even learning the language Tamazight, and preparing the opening of the MediaSpace. Sustainability is achieved by integrating locals as tutors in the weekly sessions in the MediaSpace and collaborating with a trustworthy and prestigious NGO.

8 Future Work

In the next phase, the MediaSpace will be equipped with new Maker technologies (such as a 3D printer and sensors). The researchers with the computer science background will visit the valley and the MediaSpace regularly to teach the tutors how to use these technologies, while the anthropologist will remain in the valley and observe how the inhabitants will integrate the MediaSpace in their daily routines, who will attend the weekly computer club sessions, how will they use the provided technologies and what kind of projects will they conduct.

In parallel, the MediaSpace will be connected with the existing infrastructure of computer clubs in Palestine and Germany to exchange projects and ideas and foster cooperation across boundaries.

Over time, as part of the long-term plan, collaborations with national universities should be established to transfer the concept to other places and encourage an exchange of research. Further, it is planned to build and integrate a mobile MediaSpace to reach the far-off villages in the valley and the nomads living on top of the hills who hardly would visit the MediaSpace in the centre.

Acknowledgments

References

Aal K, Mouratidis M, Weibert A, Wulf V (2016) Challenges of CI Initiatives in a Political Unstable Situation - Case Study of a Computer Club in a Refugee Camp. In: Proceedings of the 19th International Conference on Supporting Group Work. ACM, New York, NY, USA, pp 409–412

Aal K, von Rekowski T, Yerousis G, et al (2015a) Bridging (Gender-Related) Barriers: A comparative study of intercultural computer clubs. ACM Press, pp 17–23

Aal K, Yerousis G, Schubert K, et al (2014) Come_in@palestine: adapting a german computer club concept to a palestinian refugee camp. ACM Press, pp 111–120

Ahmed N, Haque AMM, Doyle L (2015) Entering the dream world of computers. ACM Press, pp 1–4

Aker JC, Ksoll C, Lybbert TJ (2012) Can mobile phones improve learning? Evidence from a field experiment in Niger. Am Econ J Appl Econ 4:94–120

Al Jazeera (2016) Germany's Refugee Crisis. In: Al Jazeera. http://goo.gl/wDpcZG. Accessed 16 Apr 2016

Almohamed A, Vyas D (2016) Designing for the Marginalized: A Step Towards Understanding the Lives of Refugees and Asylum Seekers. ACM Press, pp 165–168

Aylett R, Kriegel M, Lim MY, et al (2009) ORIENT: interactive agents for stage-based role-play. In: Proceedings of The 8th International Conference on Autonomous Agents and Multiagent Systems-Volume 2. International Foundation for Autonomous Agents and Multiagent Systems, pp 1371–1372

Baranoff J, Gonzales RI, Liu J, et al (2015) Lantern: Empowering Refugees Through Community-Generated Guidance Using Near Field Communication. ACM Press, pp 7–12

Canada: Immigration and Refugee Board of Canada Morocco Education Facts & Stats. http://www.nationmaster.com/country-info/profiles/Morocco/Education. Accessed 5 Aug 2016

CIA The World Factbook — Morocco. https://www.cia.gov/library/publications/the-world-factbook/geos/mo.html. Accessed 20 Aug 2016

Crawford D (2008) Moroccan households in the world economy: labor and inequality in a Berber Village. LSU Press

Crawford D, Hoffman KE (2000) Essentially Amazigh: urban Berbers and the global village. Arab-Afr Islam Worlds Interdiscip Stud 117–133

Dias MB, Mills-Tettey GA, Mertz J (2005) The TechBridgeWorld initiative: broadening perspectives in computing technology education and research. ACM Press, pp 17-es

Dodson LL, Sterling SR, Bennett JK (2013) Minding the gaps: cultural, technical and gender-based barriers to mobile use in oral-language Berber communities in Morocco. ACM Press, pp 79–88

Encyclopædia Britannica Jugurtha | king of Numidia | Britannica.com. https://www.britannica.com/biography/Jugurtha. Accessed 20 Aug 2016

Fisher KE, Yefimova K, Yafi E (2016) Future's Butterflies: Co-Designing ICT Wayfaring Technology with Refugee Syrian Youth. ACM Press, pp 25–36

Gaikwad K, Paruthi G, Thies W (2010) Interactive DVDs as a platform for education. ACM Press, pp 1–10

Gellner E (1969) Saints of the Atlas. Weidenfeld & Nicolson

Harney N (2013) Precarity, Affect and Problem Solving with Mobile Phones by Asylum Seekers, Refugees and Migrants in Naples, Italy. J Refug Stud 26:541–557. doi: 10.1093/jrs/fet017

Hoan NT, Chib A, Mahalingham R (2016) Mobile phones and Gender Empowerment: Enactment of "Restricted Agency." ACM Press, pp 1–10

Hoffman KE (2008) We share walls: Language, land, and gender in Berber Morocco. John Wiley & Sons

Kafai YB, Peppler KA, Chapman RN (eds) (2009) The Computer Clubhouse: constructionism and creativity in youth communities. Teachers College Press, New York

Kemmis S, McTaggart R (2005) Participatory Action Research: Communicative Action and the Public Sphere. Sage Publications Ltd

Kingdom of Morocco (2008) Digital Morocco 2013: The National Strategy for Information Society and Digital Economy 2009-2013. Ministry of Industry, Trade and New Technologies, Rabat

Leppänen S, Piirainen-Marsh A (2009) Language policy in the making: an analysis of bilingual gaming activities. Lang Policy 8:261–284. doi: 10.1007/s10993-009-9130-2

Lopez D, Franquesa D, Navarro L, et al (2015) Participatory learning process through ICT4D projects. ACM Press, pp 553–557

Lotan G, Graeff E, Ananny M, et al (2011) The Arab Spring| the revolutions were tweeted: Information flows during the 2011 Tunisian and Egyptian revolutions. Int J Commun 5:31

Maloney J, Resnick M, Rusk N, et al (2010) The Scratch Programming Language and Environment. ACM Trans Comput Educ TOCE 10:16

Michalchik V, Llorente C, Lundh P, Remold J (2008) A place to be your best: Youth outcomes in the Computer Clubhouse. Prep Comput Clubh Netw One Sci Park Boston MA

Müller C, Neufeldt C, Randall D, Wulf V (2012) ICT-development in residential care settings: sensitizing design to the life circumstances of the residents of a care home. ACM Press, p 2639

NationMaster Morocco Education > Illiteracy rates by sex Facts & Stats. http://www.nationmaster.com/country-info/profiles/Morocco/Education/Illiteracy-rates-by-sex. Accessed 19 Aug 2016

Ndaiga W, Salim A (2015) Kids hacker camps in Kenya: hardware hacking effectiveness in skills transfer. ACM Press, pp 1–4

Ogonowski C, Aal K, Vaziri D, et al (2016) ICT-Based Fall Prevention System for Older Adults: Qualitative Results from a Long-Term Field Study. ACM Trans Comput-Hum Interact 23:1–33. doi: 10.1145/2967102

Resnick M, Rusk N, Cooke S (1998) The computer clubhouse. Schon B Sanyal W Mitchell High Technol Low-Income Communities

Rode JA, Weibert A, Marshall A, et al (2015) From computational thinking to computational making. ACM Press, pp 239–250

Rohde M, Aal K, Misaki K, et al (2016) Out of Syria: Mobile Media in Use at the Time of Civil War. Int J Hum-Comput Interact. doi: 10.1080/10447318.2016.1177300

Sawhney N (2009) Voices beyond walls: the role of digital storytelling for empowering marginalized youth in refugee camps. ACM Press, p 302

Schubert K, Weibert A, Wulf V (2011) Locating computer clubs in multicultural neighborhoods: How collaborative project work fosters integration processes. Int J Hum-Comput Stud 69:669–678. doi: 10.1016/j.ijhcs.2010.12.007

Slawson N (2016) In Morocco's Atlas mountains, Berber girls find the way out of rural poverty: an education. The Guardian

Stevens G, Veith M, Wulf V (2005) Bridging among ethnic communities by cross-cultural communities of practice. In: Communities and Technologies 2005. Springer, pp 377–396

Stevens G, Veith M, Wulf V (2003) Come_IN: using computers to foster the integration of migrant communities. ACM SIGGROUP Bull 24:66–72. doi: 10.1145/1052829.1052844

Stickel O, Hornung D, Aal K, et al (2015) 3D Printing with Marginalized Children—An Exploration in a Palestinian Refugee Camp. In: Boulus-Rødje N, Ellingsen G, Bratteteig T, et al. (eds) ECSCW 2015: Proceedings of the 14th European Conference on Computer Supported Cooperative Work, 19-23 September 2015, Oslo, Norway. Springer International Publishing, Cham, pp 83–102

The Guardian (2015) Germany's response to the refugee crisis is admirable. But I fear it cannot last. The Guardian

UNHCR Refworld | Morocco: Brief history of the Berbers including their origins and geographic location. In: Refworld. http://www.refworld.org/docid/3df4be668.html. Accessed 20 Aug 2016

Velghe F (2013) Literacy acquisition, informal learning and mobile phones in a South African township. ACM Press, pp 89–99

Wang M, Shen R, Tong R, et al (2005) Mobile learning with Cellphones and PocketPCs. In: Lau RWH, Li Q, Cheung R, Liu W (eds) Advances in Web-Based Learning – ICWL 2005. Springer Berlin Heidelberg, Berlin, Heidelberg, pp 332–339

Weibert A, Wulf V (2010) "All of a sudden we had this dialogue...": intercultural computer clubs' contribution to sustainable integration. In: Proceedings of the 3rd international conference on Intercultural collaboration. ACM, pp 93–102

Wulf V, Aal K, Abu Kteish I, et al (2013a) Fighting against the wall: social media use by political activists in a Palestinian village. ACM Press, p 1979

Wulf V, Misaki K, Atam M, et al (2013b) "On the ground" in Sidi Bouzid: investigating social media use during the tunisian revolution. ACM Press, p 1409

Xu Y, Maitland C, Tomaszewski B (2015) Promoting participatory community building in refugee camps with mapping technology. ACM Press, pp 1–4

Yerousis G, Aal K, Rekowski T von, et al (2015) Computer-Enabled Project Spaces: Connecting with Palestinian Refugees across Camp Boundaries. ACM Press

Zegura EW, Grinter RE (2013) Community building for capacity building: case study of Liberia's iLab. ACM Press, pp 171–174