

EVALUATING ICT INITIATIVE IN SCHOOLS IN NORTHERN KENYA: EXPECTED FAILURES, UNINTENDED CONSEQUENCES

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Abstract

This study investigates changes that teachers and schools in the village of Korr, Kenya have experienced as a result of the introduction of the information and communication technology (ICT). Based on data from surveys and interviews, it identifies the meaning of technology integration in education on the ground, by analyzing teachers' technological use and their perceptions of using technology for education. Revealing a considerable gap between what is locally applied and what is globally perceived in terms of ICT integration in education, this research contributes to the dialogue that emphasizes local meaning of global agendas and advocates for local voices.

Introduction

Given the belief that technology can improve teaching and learning in unprecedented ways, interest in integrating ICT into education has increased dramatically since the beginning of the 21st century (Guttermann, Rahman, Supelano, Thies, & Yang, 2009; Tinio, 2003). Despite the debate over its effects in education, the growing interest in ICT has resulted in a number of educational initiatives that introduced technology in developing countries (Hawkins, 2002). There is, however, a paucity of studies exploring the other side of success or failure and the complicated circumstances underlying such initiatives. Considering the gap between rhetoric and reality, this research contributes to the field of international development by investigating the ICT initiative in schools in Korr, Kenya, focusing especially on its expected failures and unintended consequences.

Introducing ICT, in fact, seemed nearly impossible in Korr because it is one of the underprivileged regions in Kenya without any basic social infrastructure. However, changes began when a non-profit organization that had worked in partnership with the Tirrim Group of Schools in Korr, Hope is Education (HoE), aimed to provide local teachers with basic access to ICT. A task force team named Hope is ICT and Educational Development (HIED) was formed in South Korea to introduce ICT to schools in Korr, which covered teachers' capacity building as well as the infrastructure development (Hope is Education, 2012). In addition, HIED conducted research on perceptions and uses of technology among teachers in August 2012, as baseline data for needs assessments.

For the four years after the project, ICT has indeed brought about a few changes in Korr most manifestly in teachers' technological use. Yet, if the immediate implementation of technology-based learning is the standard by which we measure the success of ICT initiatives, this one seems to fail, which is neither surprising nor unexpected considering the deficiency of adequate infrastructures and lack of experience. On the other hand, interestingly enough, some unintended consequences were gradually revealed. Although

technology has not changed the teaching and learning practice dramatically, it has become the catalyst for changes in school culture.

In this context, this research evaluates HIED's ICT initiative in Korr, analyzing changes that teachers and schools in Korr have experienced as a result of the introduction of ICT. Specifically, it explores how teachers have been using computers and the Internet and what changes such technological use have brought in schools. By situating the study in the larger context of introducing ICT in education in developing countries, it also investigates what lessons can be learned from the case of Korr.

Literature Review

In recent years, a number of developing countries have experienced the introduction of technology in education. Consequently, numerous studies have attempted to draw lessons from such ICT initiatives (e.g., Gutterman et al., 2009; Hawkins, 2002; Stanton & Gerrard, 2007). Especially interesting from my point of view is that, at a fundamental level, there seems to be a similar consensus on various lessons learned from different countries.

Hawkins (2002) addresses important lessons learned from experiences from 21 countries where the World Bank has launched substantial numbers of ICT projects. The author calls attention to the issue of sustainability, in particular, and claims that "keeping them [computers] working is a greater challenge" (Hawkins, 2002, p. 39). Based on 32 ICT projects in a number of countries, Stanton and Gerrard (2007) also emphasize the significance of securing technical and financial capacities for sustainability. In addition, in Gutterman et al.'s (2009) synthesis of 25 countries, monitoring and evaluation surfaced as serious issue to ensure sustainability of ICT projects, which Stanton and Gerrard (2007) establish as well.

Furthermore, much scholarly work has been done on the topics of teachers and technology integration, and greater attention has been shown to the question of how individual teachers integrate technology in education (e.g., Hennessy, Harrison, & Wamakote, 2010; Albirini, 2006). Hennessy et al. (2010) investigate teachers' motivations for using ICT, existing barriers to their use of ICT, and effects of the use of ICT on teachers in sub-Saharan Africa. They then point out that most teachers are not competent to use ICT and do not have enough knowledge of how to incorporate technology into learning and teaching. Albirini (2006) also analyzes teachers' attitudes toward ICT in schools in Syria, and reports the lack of computer resources and teachers' low proficiency in using computers. Indeed, some common challenges seem to exist, which teachers in Korr might also have faced.

On the other hand, it is imperative to review the context of the country where Korr, the research site, belongs. Kenya has a relatively well-established education system, and it is evident that the country has a need and aspiration for ICT (Ministry of Education, 2006). However, considerable doubt has been cast over how those needs have been met to date (Farrell, 2007; Kinuthia, 2009). In fact, and regrettably, the ICT strategies outlined in the Ministry of Education (2006) appear to have lost track of its mission and are skewed from reality. Although the government of Kenya explicitly states its mission as "to integrate ICT in education and training for improved access, learning, and administration" (Ministry of Education, 2006, p. 3), throughout the document, it does not provide any specifics on how to utilize ICT to improve administration at the school

level. It neglects the importance of utilization of ICT in administration, or it identifies strategies for administration with strategies for access or learning, which leads to a misunderstanding about the role of ICT in education at country level.

Leaving aside the focus on its integration into education, ICT certainly seems to influence people's value and cultural perception, even if it was not intended. Sida (2009) states that the essence of ICT is closely related to empowerment. Indeed, empirical data support that the free flow of information provides people with the right to know and freedom of expression, which leads to the promotion of democracy in the Global South including Middle Eastern and African countries (Shirazi, 2008; Sida, 2009). These analyses shed light on the unintended consequences that the ICT has brought in Korr in the context of empowering teachers and changing the school culture.

Theoretical Framework

One of the most fundamental changes that has dominated the educational sector in the 21st century is the introduction of e-learning, a result of a transition to the current information society. Although the effectiveness of using ICT in education still remains controversial, it is difficult to deny that we have already entered an era in which technology has transformed the way we learn and teach (Garrison & Anderson, 2003).

Several developing countries are also experiencing the introduction of ICT and its integration into education in an unprecedented way (Hawkins, 2002; Stanton & Gerrard, 2007). Interestingly, unlike in more developed countries, such changes do not seem to trigger a high level of controversy about integration of technology in education in the developing context. There seems to be a nearly universal consensus or at least a tacit agreement that integrating technology will improve education in developing countries.

With these in mind, I approach the present research from a world culture theory perspective. Whether or not the existence of a worldwide trend in education is a myth, certain cultural convergence seems to exist in terms of technology integration in education, which many countries now prioritize. However, I believe that now we should go beyond the concept of worldwide phenomena that has preoccupied the world culture scholarship to get the big picture right. According to Silova and Brehm (2015), some researchers have also questioned the existence of world culture by pointing out the considerable divergence between universally propagated notion and locally perceived meaning (e.g., Anderson-Levitt, 2003; Schriewer, 2012; Steiner-Khamsi, 2004). Local distinctiveness, which most world culture research has neglected, could be what actually matters in the world culture debates.

By adopting a world culture lens, I will identify and critically analyze the local meaning of technology integration in education in Korr. Despite the global phenomenon, there has been a significant gap between what is globally perceived and what is locally applied in terms of technological use in education in Korr. The geographical remoteness and lack of infrastructure have constrained technology development in Korr, which in turn hindered the discussion of technology integration into education. Although the pace of change has dramatically accelerated since Internet access became available in 2014, local discourses on how to integrate ICT into education may still be far from what is globally discussed. Thus, analyzing teachers' perceptions, attitudes, and uses of ICT at the moment and investigating changes that have occurred as a result of the introduction of technology would reveal the local implications of technology integration into

education—that is, what is available and what is practicable at the local level.

As Hope is Education (2012) advocates, I believe that the local people should be the primary agents who make decisions regarding what technology is appropriate to a specific context and how it can be integrated into education. In line with the critics of world culture scholarship, this study contributes to the dialogue that emphasizes the local meaning of global agendas and controversy over global consensus.

Methodology

I was involved in HIED's ICT initiative in 2012, and thus was able to design this research with longitudinal data. In 2012, HIED conducted interviews with people in Korr including teachers, school administrators, and community leaders, and surveyed 31 teachers—total population at that time—in Tirrim schools. Both data captured people's perceptions, attitudes, and uses of technology before the ICT initiative. Data for this study were collected remotely online by means of closed questionnaires and semi-structured interviews between late 2015 and early 2016.

To capture changes in teachers' technological use, I developed a questionnaire that asked about the frequency and pattern of using ICT, including computers and the Internet. I collected responses from 26 teachers out of the total population of 29 in Tirrim schools at that time. While analyzing the data from surveys, I made sense of the data as quantifying the frequency and tendency of teachers' technological use. Although I did not draw concrete comparisons while discussing the changes between 2012 and 2015, comparing the general trends helped me identify some major changes.

Further interviews with three teachers after the survey in 2015 and 2016 followed, which provided me with a vivid picture of changes. The interviews were semi-structured to capture the kind of data I needed and to incorporate teachers' views of which I was not aware. With the data from interviews, I went through a series of coding process, and I re-analyzed them using NVivo, software that facilitates qualitative data analysis process. Themes that had emerged in the process of analysis were comprehended and consolidated in light of the preliminary literature review.

While the data have resulted in provocative findings, the present study has inevitable limitations due to the nature of remote data collection, which lacks the field investigation and observations. To overcome these limitations, I tried to obtain as much information as possible from the survey, which provided accurate data regarding teachers' use and perception of ICT. I also designed the interviews to incorporate various views by asking about specific events or incidents they had experienced and diverse opinions they had faced. Furthermore, the rigorous process of data analysis including a series of coding procedures consolidated the data without missing the details.

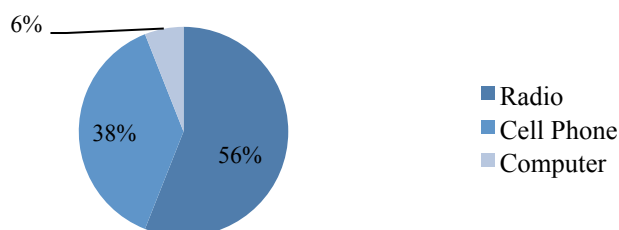
Findings

A comparative analysis between 2012 and 2015 data presents a snapshot of major changes in teachers' technological use in education and their perceptions of ICT. Also, exploring some unintended consequences is especially worthwhile in this study, since it was local teachers at Tirrim schools who have been agents of changes, which underlines the importance of local meaning as well as local voices.

How Teachers Use ICT in Education

Data from two surveys showed a stark change on teachers' technological use over the years. In 2012, as seen in Figure 1, teachers used only three kinds of digital devices; and more than half of Tirrim teachers used the radio most frequently. Interestingly, although network service was not available in Korr at that time, a number of teachers had cell phones that they used outside the village for communications, which may well indicate a high demand for ICT among local teachers. Yet, the use of computers was greatly limited due to the lack of infrastructure and resources.

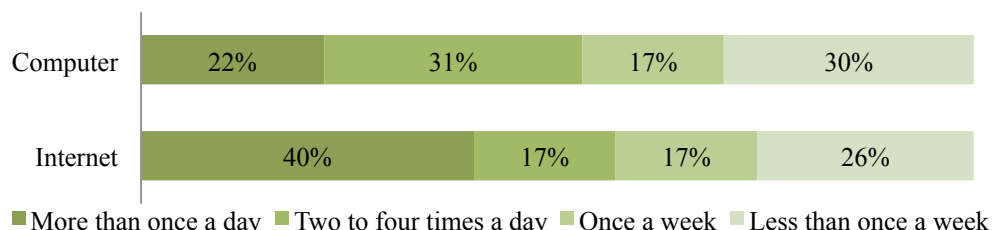
Figure 1. Distributions of digital device used by teachers in 2012.



Note. Recreated from “Finding hope on the other side of the world: ICT project report” by Hope is Education, 2012, p. 18. Copyright 2012 by Hope is Education. Recreated (or reprinted) with permission.

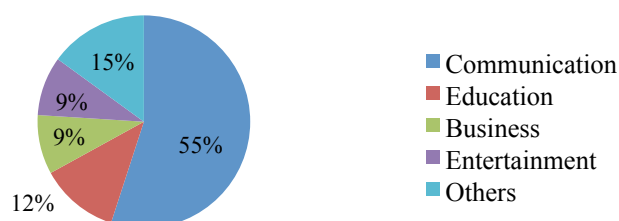
In four years, teachers' technology use has changed greatly. The laptop rental program launched after the ICT initiative and the access to the Internet have put an entirely different complexion on teachers' ICT use in Korr. Indeed, the survey results in 2015, as illustrated in Figure 2, revealed that 70% of teachers use computers and 74% use the Internet at least once a week.

Figure 2. Teachers' use of computers and the Internet in 2015.



Furthermore, the primary purpose of teachers' technological use has also changed. As illustrated in Figure 3, more than half used ICT for communication in 2012, including cell phones and the Internet, which they often used outside the village at that time. Only 12% responded that they use ICT primarily for education in 2012.

Figure 3. Primary purpose of teachers' ICT use in 2012.

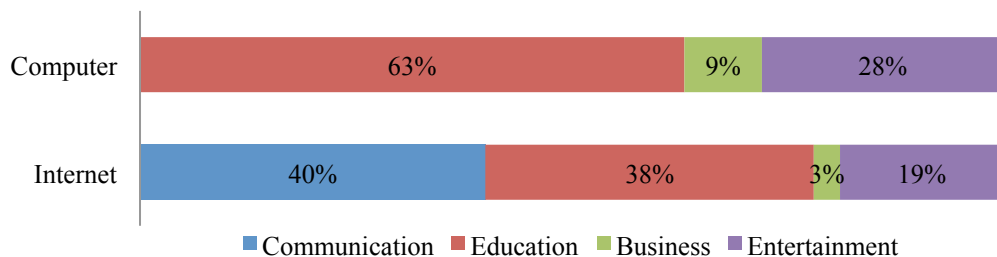


Note. Adapted from “Finding hope on the other side of the world: ICT project report” by Hope is Education, 2012, p. 17. Copyright 2012 by Hope is Education. Adapted (or reprinted) with permission.

On the other hand, Figure 4 shows teachers’ primary purpose of ICT use in 2015. Overall, the number of teachers using ICT for education has increased. Yet, the key takeaway is the differences between usage patterns in computers and the Internet. While 63% of teachers using computers utilize them for education, only 38% accessing to the Internet use it for education.

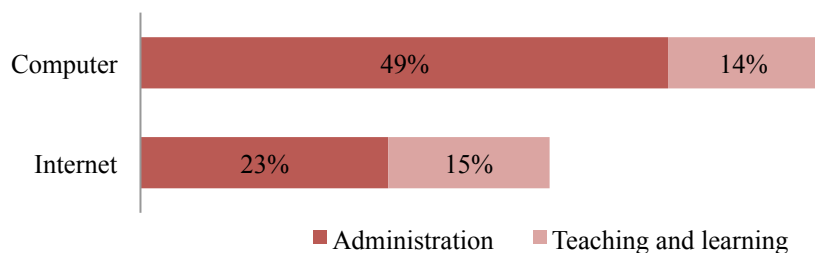
Not only is it due to the different nature of computer and the Internet, but it may be attributed to the local context of Tirrim schools. To best suit their needs, Tirrim schools distributed laptops to four schools (lower primary, upper primary, secondary, and nomadic) for school administration. However, the Internet system has not yet started to migrate in Tirrim schools, which well explains the relatively lower use of the Internet for education among teachers. Given that most teachers use the Internet via their personal cell phones, it is not surprising that until now, utilization of Internet has mainly influenced teachers’ personal lives.

Figure 4. Primary purpose of teachers’ ICT use in 2015.



Furthermore, by breaking down the educational purposes, Figure 5 shows that school administration comprises a majority of teachers’ ICT use in education. In other words, the number of teachers using computers of education has increased mainly because more teachers use computers for school administration, not for teaching and learning.

Figure 5. Educational use of computers and the Internet in 2015.



How Teachers View the Use of ICT in Education

Due to the geographical remoteness of the village, there has been a great need for technology development in Korr to provide a link with the outside world. Furthermore, according to Hope is Education (2012), Tirrim teachers expressed a higher level of need for technological use in education than was anticipated. This may be attributed to the rapid pace of change in neighboring towns or big cities in Kenya like Nairobi, where more people in Korr have exposure through both direct and indirect experience.

Little has changed in four years in teachers' perceptions of ICT and their attitudes toward technological use in education. As most teachers responded that they believe ICT is beneficial to education in 2012, many teachers agreed that ICT would have a good effect on teachers and students in Korr in 2015. They also emphasized the importance of ICT in education by mentioning that they may be able to encourage more children in the village to attend to the school with the help of ICT.

Nevertheless, teachers' perceptions of reality reveal the actual meaning of using ICT in such an underserved village as Korr. Despite their strong desire to utilize technology in education, teachers expressed concerns that they are not ready to use it to improve their teaching and learning practices. Also, in line with their usage patterns of ICT in education, both 2012 and 2015 data reveal that more than half of teachers prioritized improving efficiency of school administration using ICT. Teaching ICT skills to students and developing curriculum using ICT are the second priority in Korr, for which most teachers feel they are not ready. This indicates a serious gap between teachers' perceptions and national strategies as well as global priorities that aim to integrate ICT into teaching and learning. The needs and priorities teachers identified unpack their perceptions of ICT and attitudes toward its integration in education, which reveals the local meaning on the ground.

Unintended Consequences: The Foundation of Teachers' Association

After the ICT initiative, local people and groups in the community started to show an interest in the newly built development center with the solar power panel and the laptop rental system. The introduction of ICT reached far beyond the boundary of schools, sparking interest and generating attention throughout the village. Although community engagement and collaborations are usually helpful, it became hectic after too much attention led to various opinions and disagreements about the best way to utilize ICT in Korr.

Interestingly, this tension featured the initial step of regular teachers as local power in this traditional village where decision-making power has been a privilege of a few people holding certain positions. Individual teachers began to speak with one voice, and they actually suggested and implemented the plan to distribute computers to each Tirrim school for efficient school administration. Because they had realized such change was necessary, they started to follow up with action.

Furthermore, in September 2014, 24 Tirrim teachers founded an autonomous group called Tirrim Teachers Association (TITA). It seems that certain influence ICT had brought had become the catalyst for such movement. Teachers who led this movement also witnessed how ICT influenced teachers' thoughts and movements. ICT had provided each teacher with a direct connection with the outside world, whereby they could get a massive amount of information and an opportunity to take the lead. Indeed, a number of teachers voluntarily contributed money and time to establish TITA, which is a learning community and decision-making group for teachers.

The founding of TITA shows that ICT has empowered local teachers with the freedom of information. It can be considered a form of democracy, since TITA members are willing to challenge the traditional structure and culture in their schools. Albeit in the early stages, Tirrim teachers have begun to make themselves heard on various issues surrounding the school.

Furthermore, since TITA plans to organize workshops for teachers on using ICT, it is expected to play a pivotal role in expanding technological use in education. Indeed, although most teachers have mainly used ICT for administration up until now, such networks will reach fruition when they have the capacity to actually integrate ICT into teaching and learning.

Discussion

Coupled with the theoretical framework of this study, the findings support the view that there may be a large discrepancy in the understandings of technology integration into education in the developing context between expectation and reality. They reveal that introducing ICT by no means guarantees the successful integration of technology in the curriculum or the development of e-learning in schools where teachers and students do not already have a culture of using ICT. This is why I argue that the ICT initiative in Korr resulted in predictable failures: it was impractical in the first place to expect Tirrim teachers to integrate ICT into their teaching practices as a result of the 2012 initiative, which HIED itself had acknowledged (Hope is Education, 2012). Incorporating the implications from Korr, it appears that an alternative approach to introducing ICT for educational development is needed, especially when schools first encounter ICT and thus start from scratch when integrating it into their educational approaches and practices.

The concept of cultural capacity, which is based on the accumulation of ICT experiences within schools, is key here. The change that schools in developing countries would undergo in integrating ICT into education reaches beyond the merely personal level; it signals the transition to an information society. Indeed, what matters in the developing world context, in which most countries are latecomers to ICT, is helping schools bridge the cultural gap through strategic approaches and intensive support. Improving individual teachers and students' ICT skills and knowledge for integrating technology into actual teaching and learning is the second priority, which is, and indeed must be, based on a broader culture of using ICT in schools.

In this context arises the importance of infrastructure development that many researchers argued (e.g., Gutterman et al., 2009; Hawkins, 2002; Stanton & Gerrard, 2007). To create environments within schools where the culture of using ICT can flourish, developing ICT infrastructure is essential. Since providing basic access to ICT could increase teachers' overall technological usage and influence their cultural capacity in Korr, sufficient infrastructure development will allow schools to accumulate experiences and exposures, which would serve as a foundation for integrating technology into education.

Moreover, the case of Korr sheds valuable light on the importance of the local meaning. Specifically, what local teachers think of technological use in education was different from what is commonly pursued at a policy level in Kenya and around the world. Most teachers prioritize using ICT for school administration and do not feel ready to integrate it into their curriculum or teach it to their students. Based on the case of Korr, this study has revealed that the local meaning of using ICT in education may differ dramatically from the way that ICT is being introduced in many other developing countries.

This gap between local meaning and global perception may be attributed to the different local contexts, of which people from outside an area might not be sufficiently aware.

Thus, there is no universal rule that applies to different educational settings around the world for ICT integration in education. Disseminating best practices or transferring policy and strategy may not be an effective way of introducing ICT in developing countries. Even if some practices or policies work well in one setting, that does not necessarily mean that they will in other settings. Not all schools have to utilize ICT for school management, nor do all students have to change the way they learn by adopting e-learning. Figuratively but technically, if the world were only 100 schools, we might find 100 different kinds of local meaning of ICT integration in education.

It is worth reiterating that at the heart of local meaning is the cultural capacity. The more capacity and experience in ICT schools gain, the more obvious their definitions of ICT integration in education will become. The founding of TITA has great implications in this context; it was not until then that teachers clearly envisioned ways of utilizing ICT to improve education in Korr. Indeed, it is empowered and experienced individuals who will take the initiative and ultimately make changes. Such local voices will illuminate local meaning, thus paving the way for improving education on the ground.

Conclusion

This study has investigated changes that the introduction of ICT has brought to teachers and schools in the village of Korr, Kenya. What emerges from the analysis is that the meaning of ICT integration in education on the ground may be different from what is nationally or globally perceived at a policy level. Notwithstanding that it is a case study focusing on a small group of teachers and schools, it has thought-provoking implications in a larger context, which provides a stepping-stone for future research.

It is obvious that ICT in educational development is growing in importance, as has also been confirmed many times by the international community (e.g., Incheon Declaration, 2015, Qingdao Declaration, 2015). It is my hope, then, that this study will contribute to broadening and deepening our understanding of ICT and education in the developing context.

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