

“Wait and See”: Uses and Gratifications of ICTs in an Indigenous Community

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ABSTRACT

As personal and collective community development becomes increasingly inseparable from interactions with information and communication technologies (ICTs), new constructs representing this relationship need to be explored. In Malaysian Borneo, many indigenous communities are connected to the internet and using ICTs for socio-economic development. This research presents a case study of ICTs use by an indigenous community and inquires if ICTs can address the challenges and open up new opportunities in contemporary life. By using a qualitative approach, the author interviewed 15 participants to understand the use of ICTs to achieve their personal and community's gratifications. This paper highlighted that the community members consider ICTs an important part of their contemporary life. Nevertheless, before making any decision on ICT-related projects, they perform a reflexive examination on the possible impacts of the technology and project. This research also discussed the unanticipated benefits and the negative outcomes of the new technologies on the routine life of the Long Lamai community.

KEYWORDS

Borneo, ICT for Development, Indigenous Community, Long Lamai, Mindfulness, Oroo, Slow Learning, Uses and Gratifications

INTRODUCTION

Since the late 1990s at the global level, there have been great expectations for the potentials of information and communication technologies (ICTs) as primary drivers of socio-economic development. ICTs and the internet have been promoted as the new means to unlock the potentials and advance the process of development. Scholars (such that Wellenius, (1977)) suggest that efficient telecommunication facilities promote economic development, especially in rural areas. Therefore, the research field of information communications and technology for development (ICT4D) emerged and ICTs have been promoted as a new tool for social transformation and economic development. This is particularly so as the world moves into the information age where wealth creation and accumulation are increasingly dependent on high technology for the exchanges of data, information, and knowledge (Pareek & Gangrade, 2016). Nonetheless, in tandem with this optimism vested in the promises of ICTs as a new social and economic force in the world economy, there is also a worldwide concern over the increasing information gaps. Known as the Digital Gap or Information Gap, this discrepancy of access exists not only between the rich and the poor, between developed and developing nations but also between urban and rural populations and in the rural between indigenous and non-indigenous population. Indigenous communities generally suffer high levels of poverty due to greater economic

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instability than non-indigenous counterparts (Gigler, 2015). Most of the indigenous population engaged in low productivity farming activities, and due to the geographical conditions, they have a low-level of infrastructural development and access to essential services such as health, education, and communication. Remoteness is one of the big challenges for them and until the advent of the ICTs, maintaining close relationships with migrated family and friends has posed challenges. However, in the recent past it is well noted that ICTs have played a more promising role than any other development tool in terms of enabling choice and capabilities of individuals; a multitude of different outcomes that cannot be pre-determined (Kleine, 2009). With access to the internet, indigenous community members can stay connected with each other across distances via video calls, instant text messages, and other means facilitated by broadband. Indigenous community members can in many instances also stay in their home communities while receiving health and wellness treatments, engaging in educational opportunities, and getting the opportunity to participate in the larger societies and economies around them. Ultimately, embracing the ICTs and internet as a way to improve, rather than hinder, self-sufficiency, preservation of culture, real sovereignty, and general economic conditions.

In this study, we aim to investigate an indigenous community's experience of embracing ICTs in their daily life, usage, access, and preferences of information resources available on the World Wide Web. Furthermore, the role of ICTs in gratifying the personal as well as community's developmental needs has been also investigated. Specifically, the present study addresses the following research questions (RQs):

RQ1. How are community members using ICTs in their daily lives?

RQ2. How are they using ICTs to fulfill their developmental needs?

LITERATURE REVIEW

According to the latest ITU estimates, there are 4.1 billion people online by the end of 2019, but 46.7% of the world's population (some 3.6 billion people), the majority living in Asia, is still offline, and unable to connect regularly (ITU, 2019). Key characteristics of the world offline population are existing inequalities in terms of gender, age, income, remoteness, rurality, and education. Indigenous communities share all the characteristics of the offline world. There are more than 370 million indigenous peoples in the world in which 260 million (70%) of the population lives in Asia (UN-DESA, 2009). Indigenous peoples make up 15 percent of the world's poor and one-third of the people living in extreme poverty (Hall & Gandolfo, 2016). Nevertheless, wherever indigenous people have access to ICTs, it became an essential part of their lives and rapidly transforms the lives of the local communities (Rice et al. 2016). The information highway, broadband brings faster and more efficient communication tools to remote communities. Thus, the researchers continuously emphasized and highlighted the need of investigating the role of ICTs in the development of remote and indigenous communities (Whiteduck, 2010). In the below section, we will discuss some of the related researches that investigated similar questions in other parts of the world.

Indigenous Community and Access to ICTs

According to the Australian Bureau of Statistics, 13% of indigenous households in remote rural areas have an access to the internet and ICTs, compared to 62% of non-indigenous households (Du, & Haines, 2017). In Canada, recently the government accepted the challenge of the digital divide and declared broadband internet access as a 'basic service' which is considered an important move to improve access and speed of internet in remote and rural communities (Kupfer 2016). Following the move, indigenous communities of Canada are leading internet and ICTs development in their localities and reasserting the autonomy of First Nations on addressing their issues (McMahon, 2014). However, lack of human capital and technical training for the indigenous population are the impediments in

many communities to develop local infrastructure and to bridge the digital divide (Fontaine, 2017). In Malaysia, the figures do not specifically represent indigenous communities however, there is a significant divide in terms of internet and ICTs adoption between urban and rural residents. 70% of internet users reside in an urban area in comparison to 30% of internet users in a rural area. The ratio of internet users by strata is 2.3 urban users to 1.0 rural users (MCMC, 2018). Also, the computer literacy rates in urban and rural areas were 68.6 percent and 42.1 percent, respectively (UNICEF, 2014). To address these challenges and to provide the benefits of ICTs to rural communities, the Malaysia Communication and Multimedia Commission (MCMC) under the Universal Service Provision (USP) has set up five initiatives Pusat Internet 1 Malaysia (PI1M) and Mini Community Broadband Centres (CBC); the 1 Million Netbook Initiative; E-Kiosks; 'CBC to the Home'; and expansion of cellular coverage.

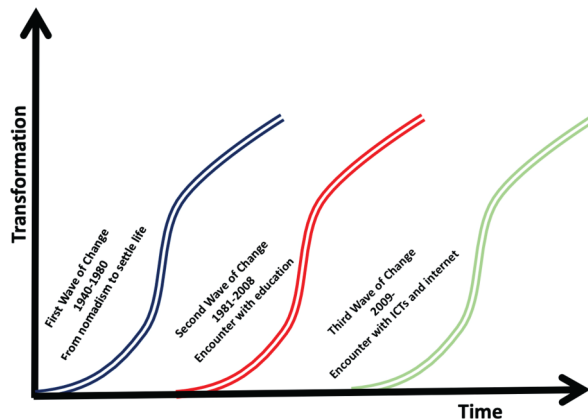
Indigenous Communities and Use of ICTs

The discussion goes beyond ICTs access and the role of ICTs and the internet as enablers of other basic rights, such as the right to education, the right to information, and even the right to development has been highlighted in the recent past. Therefore, the researchers are widely examining how and under what conditions internet and ICTs access can be made usable by, among others, marginal or excluded populations and communities. Developing strategies and applications for using ICTs to support local economic development, social justice, and political empowerment; ensuring local access to education and health services; enabling local control of information production and distribution; and, ensuring the survival and continuing vitality of indigenous cultures are among the most significant possible applications and goals. Indigenous people often lack access to healthcare and education services due to a range of barriers including the high cost, experiences of discrimination and racism, and poor communication with development agencies. First Nation of Canada living in remote and rural areas are greatly dependent upon ICTs to ensure their health, wellness, and education. Kennedy et al (2017) reported the case of the First Nation community living in remote areas of Canada, which are active users of the internet especially women, communicating with community diaspora and dealing with health issues with telemedicine. Smith et al (2019) highlighted telehealth as a "game-changer" for the provision of health services to Aboriginal and Torres Strait Islander communities in Australia. Also, the role of information and communications technology has been discussed in terms of documenting indigenous knowledge (Chikonzo, 2006; Haag & Coston, 2002; Johnston, 2008; Maina, 2012; Yeo, Zaman and Kulathuramaiyer, 2015), education and learning (Bilal, 2002; Kim, Miranda, & Olaciregui, 2008), economy and business development and public administration (Sein & Harindranath, 2004; McCallum & Papandrea, 2009), as well as maintaining social relationships (Kral, 2010). Few authors also discussed the adverse effects of ICTs in indigenous communities such that Ono and Zavodny (2007) pointed that "differentiated spread" of the internet leads to increasing inequalities and may benefit the advantageous groups over underprivileged populations. Chulu (2015) highlighted the issue of cultural dissonance in Africa, where local culture and values are dominated by the internet, a carrier of "Western culture and values". Therefore, the dominant question in the literature is no longer one of whether indigenous communities have adequate access to ICTs or not, but whether they can adequately use and understand the changing digital technologies that increasingly bringing change in their lifestyle.

BACKGROUND

Long Lamai is a remote Penan village in the upper Baram region of Sarawak state in Malaysia Borneo. It is a "remote" and "rural" community without a road access, hospital/clinic, and piped water though having limited power supply and telecommunication services. The population of the village is 600 individuals with 116 houses (Falak, Chin & Wee, 2016). The available infrastructures at Long Lamai consist of a Penan school, a church, a community hall, a micro-hydro, a Telecentre currently not

Figure 1. Long Lamai: the three ways of change



connected to the internet, and a mobile communication tower. Its remoteness and detachment from the official administrative government structure make it a peculiar place, not yet fully connected to and integrated into the market and cash economy. The forest, the river, and some of the surrounding fields of paddy rice are the source of sustenance. Surplus marketization of agricultural products is impossible due to the remoteness of the place. The phenomenon of employment is almost non-existing – only two local people are officially government employee in the village – the headman and a teacher in the primary school. The living conditions vary for different families – few have electricity generators, a good supply of water, connection to the micro-hydro, and restroom facilities.

Long Lamai: Three Waves of Changes

There are three waves of changes that marked the life of the Long Lamai community (Figure 1).

The first wave was from 1940-1980, a transition from nomadism to settlement. The transformation was led by the Christian missionaries who brought the “life under the sun”, that is on paddy farming and settlement. The transition is also facilitated and supported by the colonial authorities and that portrays a positive image of “white man” in the Penan communities. In the new environment, it is increasingly difficult to fully fall back on the forest for daily needs or tradeable products. The semi-nomadic and settled life has changed the people’s routine and lifestyle in the Long Lamai community. They are more dependent on cash income in their new economic life while today, compare to their nomadic life, they have less jungle produce and means of income (like rattan and *gaharu*).

The second wave of changes was from 1981-2008, where the formal education system was introduced and the Long Lamai primary school and kindergarten have been established. The community witnessed their first university graduate in the 1990s. Today, Education is a priority of the community not only for finding employment but also to get ready the younger generation for challenges of settled life (development). During this phase of change, the community needs of cash income increased such as to send their patients to Long Banga (two hours boat journey) and Miri (8 hours four-wheel drive) or kids to Bario and Marudi for secondary school, they need to buy fuel or pay for renting a car.

The third wave is from 2009 onward; when the telecommunications services and internet introduced in the Long Lamai community. It has been started with the establishment of eLamai Telecentre project and later on mobile connectivity has been enhanced with establishment of mobile tower. During this phase the big challenge for community is to keep intact the Penan social and cultural values and to sustain a competitive market-based economy.

ICTs Access and Use in Long Lamai

In 2008, a local Penan graduate led a group of researchers from Universiti Malaysia Sarawak to Long Lamai to initiate possible research partnerships. Since then, the community with the collaboration of local and international researchers embarked on multiple ICT initiatives. Below is a brief introduction of these initiatives.

eLamai Telecentre

Till 2009, some of the Long Lamai community members may have mobile phone sets or laptops at their homes but it was “Ngerabit E-Lamai” Telecentre, launched in 2009, that provided internet access to the community members (Yeo et al, 2012). The project was implemented by Universiti Malaysia Sarawak as the first replication of eBario project funded under the Demonstrator Application Grant Scheme (DAGS) by the Ministry of Science, Technology, and Innovation (MOSTI), Malaysia. The community was provided with computer facilities and access to telephones and the internet via a satellite telecommunication system and powered by a solar (photo-voltaic) system (Figure 2). The main goal of telecentre was to bridge the digital divide to meets the socio-economic and communication needs of the community. In a way, the initiatives were appreciated as long-awaited means for communication for the inhabitants of the village. Ngerabit eLamai telecentre provided uninterrupted and free connectivity of the internet for 6 years and has ceased to operate in 2015 when the internet subscription expired and the telecentre project formally ended.

Mobile Communication Tower

In 2014, a mobile communication tower (Figure 2) has been set up under the universal service provision program by Malaysian Communications and Media Commission (MCMC). The mobile tower is operated by Maxis (a telecommunication service provider) and it transmitted service for phones on 3G and 4G networks, with no data capability. The mobile tower has a short lifespan and it stopped working after two years of operation. The community was unable to obtain information on maintenance obligations.

ICTs’ Trainings and Capacity Building

After providing “access”, the UNIMAS team embarked on the next initiative “train the trainers” program on the basic information technology skills for the young members of the community so they can train the other community members (Juan et al., 2010). Due to the geographical remoteness of Long Lamai, this program was run once in every two months for a year. Meanwhile, the Long Lamai

Figure 2. Left: Solar panels of the telecentre Right: Mobile communication tower



community was engaged in the discussion “what is it” and “how it works” by exploring the plausible effects, hidden impact, and prospective uses of ICTs and the internet.

ICTs for Health

Later in 2011, a healthcare mobile application was developed for the young school-children and mothers of Long Lamai community based on the Participatory Action Research in Software Development Methodology Augmentation (PRISMA) methodology (Siew & Yeo, 2012). In this study the meaning-making process grounded in the community’s response and participation has received attention and explicitly reported by the researchers.

ICTs for Culture Preservation

In the early 1990s, Long Lamai community lost their primary forest and wild plants surrounding their village in a forest fire, it resulted in the loss of knowledge about plants, birds, and animals, leading to many of the older generation forgetting parts of their indigenous knowledge. Therefore, in 2011, the eToro project was initiated to develop an ICT based platform for intergenerational knowledge exchange and documenting traditional botanical knowledge of Penans (Zaman, Yeo & Kultharainyer, 2013). In the initial stage, the project documented 50 indigenous plants, metadata, and classification and the potential medicinal use of the plants. The platform was developed based on value-sensitive design and as a result of intensive integrated, intuitive, and non-intrusive indigenous knowledge preservation process guided by co-designers from the local community. Another interesting initiative was on documentation and revitalization of Oroo’, an indigenous forest sign language of Penan. Based on co-design approaches an educational PC game (Zaman et al 2015), an instant messaging app (Zaman and Winschiers-Theophilus, 2015) and a mobile-based tangible application (Plimmer et al. 2015) have been developed to revive the unique and endangered sign language of the forest.

Reitsma et al (2019) co-designed, with Penan artisans from Long Lamai, three exhibition pieces (technological probes) a website, a musical instrument that plays every time someone accessed the website, and light bulbs that would start glowing every time a new message was posted on the website. The research aimed to co-create design probes which community can use to reflect on their perceived connection to their cultural identity.

ICTs for Tourism

With the changing lifestyle, the need for education, health, and transportation results in an increase in cash income. Yoon (2012) reported Ping Musa (36 years old), stated that “*Everything in the city requires money, which we do not have. Our hope is for our children to have a better future. We don’t want them to be illiterate like us*”. Therefore, the Long Lamai community leveraged on the rich cultural heritage and the beauty of flora and fauna and positioned Longa Lamai as an ideal eco and cultural tourism destination (Falak, Chin & Wee, 2016). Long Lamai community was hosting tourists from the nomadic life however the internet opened the door of opportunities such as the community started to leverage on the telecentre by setting up an e-commerce business to grow the handicraft industry. Zaman et al (2016) reported that with the help of local industry and academic partners the community engaged 67 artisans from Long Lamia and surrounding villages to fulfill the demands of local handicrafts.

ICTs for Genealogy

Another interesting project was cultural modeling and genealogy software for Penans by Mit et al (2011). The new genealogy software model accommodated basic information about individuals, including births, marriages, and deaths, and, most importantly, the story behind these activities/events for historical records. The project aimed to address the issue of knowledge loss in the younger generation and not just to preserve genealogical data, but the new architecture of genealogy software

that integrates cultures of minority ethnic groups of Penans community in Borneo so that the culture will not be extinct.

ICTs for Education

Mohammad et al (2019) used a combination of cultural protocols (Zaman & Yeo, 2014), game-based learning, and culturally sensitive co-design approaches to develop the CreativeCultre model for framing the learning experiences of school children of Long Lamai community. The project aimed for Co-Creation, the highest order of engagement, which entails the integration of cultural practices, artifacts, and informal learning within the playful co-design framework.

RESEARCH METHODOLOGY

We selected Uses and Gratification theory for analysis of our case as it provides a paradigm shift about participatory research and helps to explore the idea of “what do users do with the ICTs”, instead of “what do ICTs do to people”. Uses and Gratification Theory is a commonly used theoretical framework for examining how people’s use of new technologies is motivated towards gratifying needs (Chandler & Munday, 2011; Du, & Haines, 2017). This theory is applied in the study of Herta (1941) where she interviewed various soap opera fans and was able to identify three types of gratifications emotional, wishful thinking, and learning. Ever since the theory is evolving and used in different contexts and interdisciplinary studies. In this case study, the uses and gratifications theory is particularly relevant in this case study as it provides insights into community motivations of use or select certain ICTs over other forms of communication channels.

Research Method

Indigenous life is centered around relationships so as the research “with” indigenous communities. The relationships between researchers and community members evolve and based on indigenous values of trust, reciprocity, and respect. It is a time consuming, slowly evolving process and comprises a series of engagement activities such as dialogue and conversations before the research begins. The main author is an indigenous researcher and has been working with the Penans and Long Lamai community on various projects for over a decade. For this research, we used a qualitative method and interviewed 15 participants. The research study has been conducted in three visits between September 2018 and January 2020. Our data collection and analysis are informed by the uses and gratification theoretical framework and to develop our case-study, we draw on a combination of primary and secondary data. These include site visits, analysis of the existing published research, media reports, and interviews with ICTs users and community representatives of the Long Lamai community. For selecting our interviewees, we used a snowball sampling approach (Weiss, 1995). These interviews were semi-structured and focused on understanding the narrative around ICTs’ access and use, motivations, challenges, and problems encountered.

Study Participants

We started our interviewees with the community representative, which is nominated by the community to manage ICTs related projects and followed by meetings and discussion with the village headman. This is a well-established interaction protocol to be followed for conducting any research study in the Long Lamai community (Falak and Zaman, 2017). The village headman and the local champion discussed and decided about the community member that should be interviewed next. Usually this decision is based on the individual role in the community, experience, age and relevance to the research study. In total, we interviewed 15 individuals, a mixed combination of gender, occupations, and age. Of the 15 respondents 11 of them were male and 4 female. The majority (11 respondents) were aged less than 60 years old and none of the respondents were less than 20 years old. Ten of the interviewees are directly involved in agricultural activities, part of the village governance structure,

head of the youth committee, church women group, village headman or community representative in parents, teachers' association of the local school. 7 of them are also part of the Long Lamai tourism association as homestay or boat operator or tour guide. 14 respondents had education between Years 6-11 (secondary schooling, two of them was going to study at university). The average household size of the participants was 4 people and the people living in the home included both immediate and extended family members, such as grandparents, sisters, brothers, nieces, and nephews. The interviews were mainly conducted in English and Penan language. An interpreter assisted with the translation, where it was needed.

RESULTS

All of the respondents were firmly confident that ICTs and the internet bring benefits to the community and they appreciate the role of ICTs in opening the development opportunities for the Long Lamai community. In the following section, the results of the interviews have been categorized into main themes exhibiting the interviewee's perspective.

ICTs for Education and Learning

Within the modernization process, the Penan group has been facing a myriad of difficulties and challenges. Access to education, knowledge, and new skills are becoming priorities of the community not only because these can help in finding employment in the context of a market-driven economy but also as means of preparing people for civil engagement and enhancing awareness about developmental needs and priorities. According to Diana (female, 28 years old), *"Telecentre provided us the internet which helped us in learning and improving new skills such as the English language. We, in Long Lamai rarely go out to the town and also receive tourists occasionally so it is the internet and online social networks which give us opportunities to read and write in English and to improve our language skills"*. Lilian Maligan (female, 24 years old) added that she learned new food recipes from the internet.

According to Nadiana (female, 20 years old), *"We never saw a newspaper or heard timely, what was going on in the outside world until we got the telecentre and internet which help us to get the latest information and news about Malaysia and the world. The latest news is important for us; by getting the news I feel that I am a part of the world and for a little while I forget that I am in Long Lamai"*.

The primary school in Long Lamai is established in 1980s and in the 1990s they witnessed their first university graduate. The low achievement and children dropout were reflected in the early years of the school's result. It was in 2008 when the young teaching volunteers from Methodist church came to help and improved the children's exam performance. According to Garen Jengan (male, 70 years old), *"the telecentre and internet facilitate our communication and coordination with the volunteer teachers. Before telecentre, we could either post a letter or call from Miri to convey a message, which was costly and time-consuming. Internet access also helps the volunteer teachers. Being young, they like to be in touch with their families and the internet has made it easier for them to communicate with family and friends while they are serving in Long Lamai"*.

James Lalo Keso (male, 78 years old) added that *"During nomadic life, if our young people face any challenge, we the experienced one have a solution for them. We have knowledge of the forest but now, after the settlement from nomadic life, we are facing many new challenges and we need new skills and knowledge to counter these challenges. Internet and mobile phone help us to access information about our issues or contact our friends in the town to discuss the issues and to find solutions"*. Falak, Chin and Wee (2016) also reported Uda (a community elder) who reflected and mentioned education and computers, the two most promising tools of Long Lamai community to address the challenges of "new life". For the village headman Wislon Bian Bilare (male, 60 years old), one of the benefits of telecentre and internet is the facility of online access to check the school children's examinations results.

ICTs for Economic Benefits

Almost all the participants mentioned the positive economic impacts of ICTs and the internet in the Long Lamai community. Many of the participants shared the benefit of ICTs and internet for promotion, coordination and management of tourism services. The Star, a local newspaper, reported village headman Wilson's words *"Wilson [the village headman] says that the Internet has opened their eyes to the world outside and to tourism, which many welcome as a sustainable source of badly needed income"* (Yoon, 2012). According to Garen Jengan, *"the telecentre helped us in promoting Long Lamai as an ecotourism destination. Before telecentre, only Wilson (the village headman) and Balawan (the school teacher) have boats but now, there are more than 40 boats in Long Lamai. These boats serve visitors, tourists, and researchers to transport them to and from Long Lamai. Now we also have our a 4-wheel drive service from Long Puak to Miri, so because of the internet and telecentre many economic activities started in Long Lamai and we ensure that everyone shares the benefits"*. Wilson added, *"after the telecentre and other ICTs related projects, our village emerged as a model village and I am receiving many applications of Penan families from our neighboring villages who wanted to resettle in Long Lamai"*. Nadiana also mentioned that *"with internet and mobile phone access, now community gets homestay booking information ahead of time so they manage the tourism activities properly"*.

The internet also helped in promoting local handicrafts and telecentre helped in facilitating the coordination of e-business activities of handicraft businesses in the Long Lamai community. According to Sasha (40 years old), *"in 2012, we got our first order of handicrafts (500 Penan baskets) from a conference organizer in Kuching. We managed to discuss and coordinate the whole deal via Facebook. To fulfill the demand, we also hired the services of many handicraft makers from our surrounding villages and since then we are regularly producing handicrafts to local and international markets"*.

Peru Aya (male, 22 years old) mentioned that *"before telecentre, we were always on the waiting list on flights to Miri, but now we can buy flights ticket online which save cost and also help in reducing uncertainty and travel anxiety"*.

ICTs for Communication

Like many other indigenous communities, Long Lamai also wanted to be "connected" and all most all the participants in the interviewees described the roles of different ICT tools that helped in bridging the communication gap. For the younger generation, the internet and for the older generation, previously telephone booths and now mobile phone is desirable benefits of the projects. The UNIMAS telecentre was the first proper communication hub for the Long Lamai community. In addition to computers, printer, scanner, and the internet, 2 public telephone booths were established as a part of the telecentre, which has a tremendous impact on the community's means to communicate with members of the community residing outside Long Lamai. According to James Lalo, *"I don't know how to use the internet but yes, before the mobile service, the public phone facility in the telecentre was really helpful to me to communicate with my children, who are living in Miri"*.

According to Vincent (male, 35 years old), *"the internet and telecentre allow us to communicate and collaborate with the outside world. Before this, once I left my village to visit the town, I did not have any mean to keep in contact with my family and to know what is happening around until I come back to the village; but now if I leave the village, I can still contact my family on a mobile phone"*. Wilson uses his mobile phone and internet for coordination with the government department and other partner organizations and communities. He also gets much information about government schemes via internet.

Telecentre, internet and mobile phone is also helpful for mothers of young children studying and living in the towns. Long Lamia has a primary school and the children, after completing primary school, migrate to the next village Bario or Marudi for secondary schooling. One of the challenges for the community is to keep in contact with their children. According to Lydia (female, 49 years old), *"Penans consider it unkind to separate their children from family, but after primary school, we*

need to send our kids to Bario, the nearest secondary school; it takes about one week to trek there. After secondary school either they go to university or work in town. All my kids are now in towns so the mobile phone is the only medium for us to keep in contact with them. Mobile communication is costly, and I am running a homestay program to earn and to intact my contact with my children. However, everyone in Long Lamai cannot afford the cost of mobile communication “.

Unanticipated Impacts of ICTs

On my inquiry about the ICTs, telecentre, and internet benefits for Long Lamai, Garen Jengan said that *“after the telecentre project launched, my village looks cleaner than before”*. After my further investigation of the relationship between cleanness and telecentre, he builds his arguments as follows, *“before the telecentre project, there were only two boats in Long Lamia village and we were not able to generate enough cash income. After the project launched, visitors and tourists started coming into Long Lamai. Today, we have more than 40 boats; each boat is run by two people so just the boat association fulfills the cash needs of 50 to 80 families. Today, many of these families can also buy grass cutters and fuel for it. Therefore, when it is their turn in gotong royong (communal work) to clean the village they use grass cutter and other tools, which is more efficient than before”*.

The telecentre project also helped the Long Lamai community in the transformation of Penan identity. Penans are considered backward and an obstacle to modernity and progress. There were occasions where the community advised people who are not familiar with their culture and tradition not to write anything about them without consulting the Penan elders (Borneo Post Online, 2012). According to Affendi Belawan (male, 35 years old), *“telecentre project and access to ICTs and internet gave us opportunities of learning. When I was in school, I always looked at my culture and values not very useful in today’s world but with projects like eToro and Oroo’ digitalization, people from around the world showed their interests in our ancestral knowledge. As like Malay proverb katak di bawah tempurung [like the frog under the shells], we were just like frogs under the shells. With access to the internet, we are no more under the shell”*.

According to headman Wilson, *“many of our youngsters get bullied in the school because of their shyness and peaceful nature. Sometimes because of their fellows and teachers’ aggressive attitude and sometimes because of loneliness, they can’t catch up and dropout in early age. We will only see a positive change if our youngsters are well aware, educated, and responsive to the needs of the time. Internet and ICTs help them to keep momentum with the pace of changes”*. Bradley Jeffery (male, 33 years old) mentioned how the internet helped in connecting him with like-minded people to get advice on the freshwater fish farming business.

Challenges and Adverse Effects of ICTs

For almost all the youth members, internet speed and coverage in Long Lamai is not “enough”. They anticipate and compare the internet speed in Long Lamai with the speed in town. Also, currently, internet access is available only in a few spots in the village so there is a digital divide within Long Lamai.

According to Bradley, *“if I need to use the internet, I need to be at the coverage area which is a little far from my home. Also, with the current internet speed, I can’t watch my favorite music videos”*.

William Deng (male, 45 years old), highlighted how the use of ICTs has an impact of sleep deprivation in the youth. He explained *“after the telecentre project launched in Long Lamai, the youth use internet until late at night. Sometimes, they download movies and watch it on their mobile device for the whole night and in result,s they can’t help their parents the next day in farming and fieldwork”*.

Liliyen Maligan showed her concern about the Internet’s “bad” influences, and suggested censorship for the contents. Wilson, the headman has also the same opinion, he mentioned that the youth will be influenced what they access so there should be a responsible use of ICTs and internet resources. He said, *“before it was just the telecentre, where we can control the access by allowing it to operate for specific time of the day but with mobile phones and 3G, we can’t control the access*

anymore so we may need more training programs for our youth". Affendi Belawan shared the same concern and mentioned that the youth in Long Lamai can be easily influenced as they are not aware of the risks attached to open access of internet contents. As an example, he shared the case of ISIS and how it is influencing the youth around the world with Facebook and Youtube channels.

DISCUSSION

In the following section, we will discuss selected themes as extracted from the interviews and general observations of the ICTs use in Long Lamai.

Slow Learners and Mindfulness

Our participants in this study are active users of ICTs, who appear to have used ICTs to achieve their personal and community's gratifications. Penans are portrayed as hardcore opponents of any form of development. However, while using ICTs for development, the Long Lamai community embraced technology to fulfill their developmental needs and fostering their community as well. They preferred partnership projects, where the approach of community engagement, negotiation, facilitation, and project conceptualization is thorough enough and not just centered around the deployment of technologies. In our first visit to Ba' Lai, a sister village of Long Lamai, the village headman described themselves (Penans) as "slow learners". "I would like to request your patience and slow engagement process. We Penans are slow in learning new things and you need to walk with us slowly too", he said with a humble smile. It is also explained by headman Wilson, *"we may be slower in welcoming change because we need time to grasp new ideas, weigh the pros and cons, and discuss the matter with the villagers. This has often been misconstrued to mean that we are not receptive to changes."* (Yoon, 2012). Of importance, in the case of Long Lamai is the fact that ICTs represent yet another challenge for the community not that much in the sense of acquiring the technological devices and the skills to use them but in managing the social change those novel technologies can bring. That is why the question of adopting a mindful stance, of giving a specific meaning to the technology in indigenous context is very important. However, awareness or mindfulness is a skill that needs to be cultivated over time and does not occur automatically (Winschiers-Theophilus, Zaman, & Stanley, 2017) and in a way, the remoteness and the isolation of the Long Lamai village give the community some time to reflect on the possible impacts and elaborate on the precautionary or mitigating mechanisms before ICT takes on its speed the life of the people.

Learning Beyond ICTs

Long Lamai community taking the partnership in ICTs projects as learnings opportunities. According to Garen Jengan, *"only 60 years ago, we were nomad and I still remember how I was roaming in the forest with my parents. I spend 30 years in the town and still I am facing a problem on how to negotiate. The majority of our elders are like me. They are born in the forest and never went to school or worked in the town"*. During our discussion with the community elders we observed that the trust between community and researchers evolved with the passage of time and still intact and very strong. With time, when many more projects mushroomed and new researchers started to come to Long Lamai, bringing along new challenges to the collaboration. The new challenges result in new learning opportunities for community members and local leadership. The community selected the gatekeepers from the researchers' group (including the author) to act as proxies of the community to liaise with the outsiders (Winschier-Theophilus, Zaman, & Yeo, 2015). Meantime, the community systemized the process of engagement and designed interaction protocols and training programs for researchers. In addition to guidelines on the engagement process, the interaction protocols encompass community preferences on data and information management, intellectual property rights, and dealing with emerging issues in the digitalization of indigenous knowledge.

Choice of Technology

During the second wave of change, the developmental needs in the Long Lamai community increased gradually. Till 2008, the church, primary school, and a bridge on the river were the only developmental projects supported by the government and partner church organization. When the telecentre project idea was presented to the community, those who have knowledge of ICTs and have seen computers before, were in favor of the project while the community elders (the decision-makers) didn't make any decision in the initial stage. After the project team left, there were thorough discussions in the community to make a decision. According to Garen Jengan *"for our elders, the computer was a new thing and they haven't seen it before so they didn't know what can we do with a computer?"*. The youngsters used "walkie-talkie" as a metaphor of computer to them and also requested the researchers to bring a laptop for the next visit so the elders can conceive the idea of a computer and telecentre. After a year of discussions and meetings, the Long Lamai community collectively agreed to the project where the elders were still in "wait and see" status. The author observed this status, during the next few years when every time before saying "yes" to any new intervention and technology, the local community requested a break time [or pause] for internal negotiation. This break time is observed as the most critical phase before giving green light to the project team. In this phase, the community elders search for related metaphors and similar experiences of the community members or neighbor communities. The telecentre provided multiple choices of communication technologies such as phone booths for elders, laptops for village headman and local champion, and desktop computers for use in the telecentre so the widespread use of ICTs has led to massive changes in the social and cultural life of Long Lamai community. Due to rural to urban migration for jobs and education, the social life of Long Lamai stretched beyond the village, therefore ICTs became a compensatory medium to maintain connectivity and relationships. However, mobile and internet communication is not free of cost. In Long Lamai, generating cash income is still a big challenge therefore new forms of social stress such that competitive business models are emerging in the village as described by Falak, Chin and Wee (2016). We also noted that very recently, the community members adapted walkie-talkie, a subscription-free method of communicating over short distances (Figure 3).

The community stated preferences of the technology choice include free service, ease of use, and frugal design of the product. We observed that almost every household has more than one set. The walkie-talkie provides 8 channels where they use one specific channel for the community broadcast and any other channels for private communication. It works within a 4 km range of the communication distance which is sufficient for Long Lamai and surrounding forest area. Usually, everyone who goes for hunting or farming keeps a set along for communication (Figure 3). The usual communication

Figure 3. Left: a community member carrying walkie talkie in her pocket. Right: a walkie talkie set in use of village headman



includes information about an individual's whereabouts, call for a meeting, information on weather conditions, and sometimes prayer broadcast from the church.

As compared to urban communities, in Long Lamai, we observed many more uses for ICT devices. Long Lamai has intermittent mobile coverage, nevertheless, the community members and especially the young generation keeps advanced 4G mobile phones. Mobile phones are a key source of using social media, streaming music or videos, and sharing audiovisual content. These uses were felt to be particularly important during the traditional *Toro* journey to the forest for hunting, gathering, and leisure (Zaman, Yeo, & Kulathuramaiyer, 2013). We also observed community members sharing recorded birds sounds from the forest via Bluetooth. Even though the unbranded phones are generally unreliable, community members often end up buying them because of the cheaper price and multitude of features they offer (such that radio, torchlight, etc.).

CONCLUSION

The objective of this study was to gain an insight into the uses and gratifications of ICTs in an indigenous Penan community of Long Lamai in Malaysia Borneo. Around the world, the governments and development community are facing queries about the appropriate use of ICTs for development. Therefore, it could be helpful for researchers to continue to showcase how indigenous and remote communities are using ICTs to address their personal and community developmental goals. Rigorous research is vital to help in understanding the opportunities and also the limitations of the ICTs projects. The paper raises an important fact that indigenous people just access to ICTs is insufficient unless the project is framed to address the wider developmental goals of the local community. To deploy just another “white elephant” alien technology project is not a solution for supporting the indigenous communities but taking communities’ concerns, needs, and gratifications into consideration are required. The findings of the study also support Tabassum et al (2019) research about highlighting the unanticipated and indirect impacts of telecentre projects on local communities. This study leads to documenting important policy changes to develop projects for indigenous communities around capacity building, internet access, and the need to unearth the long-term sustainability challenges from the initial stages of the project. Our related research has also explored the need for community ownership and control of the research process that could be used to sustain the partnership of ICTs projects in the long term. Generally, the research on digital divide focus on “have” and “haven’t” and convert it in to binaries however, this study also highlights the importance of identifying and enquiring qualitative measures in digital divide as there are many community concerns and benefits which cannot be translated in digits “0” and “1”.

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