INFORMATION AND COMMUNICATION TECHNOLOGIES FOR CULTURAL TRANSMISSION AMONG INDIGENOUS PEOPLES

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ABSTRACT

The global digital divide threatens to exclude millions of people from the potential benefits of Information and Communication Technologies (ICTs), especially computers and the Internet. Many of these people live in rural, isolated and remote places of developing countries and are unlikely to be able to afford the cost of owning their own computers. However, NGOs, international aid agencies and governments are becoming increasingly aware of the potential that ICTs offer for rural development and poverty reduction and are creating more opportunities for providing wider access to them. This paper looks at how ICTs have contributed to the social development of a rural indigenous ethnic community. It focuses on the benefits of ICTs in recording and passing on their unique culture and traditions, something that is of considerable importance to the community. The research builds an understanding of the nature of cultural transmission within an indigenous community in East Malaysia and demonstrates how ICTs can bridge the digital divide by accentuating the importance of family, friends and other social interactions within a community in strengthening the processes of cultural transmission. Based on the findings, suggestions are offered for reinforcing social processes of cultural transmission with ICTs, in the form of a virtual museum and a community radio station.

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1. Introduction

Despite recent improvements, the global digital divide continues to exclude many people in the world, particularly those living in rural and isolated areas, of the opportunity to participate equally in the information society. The International Telecommunications Union has reported that in 2009 only 26 per cent of the world's population were using the Internet (up from 13.2 per cent in 2004), with four out of five people in the developing world still being excluded from the benefits of being online (ITU, 2010). Nevertheless, shared access to computers and the Internet is increasingly being made available across the developing world through community telecentres. A study by UNESCAP identified more than 8,000 community telecentres in six Asian countries (UNESCAP, 2007).

Most of these telecentres serve the urban populations of developing countries, leaving rural communities under-served and the more remote the community, the less likely it is to enjoy the benefits of an Internet connection. Such rural and remote locations in Asia are often populated by communities of indigenous and ethnic minority peoples who have historically existed on the margins of mainstream society and who face development problems that are specific to their unique needs and aspirations. Yet when they are provided with Internet connectivity and suitably facilitated towards using it effectively, considerable benefits can emerge (Dyson et al., 2007).

Although ICTs are widely touted as key elements for economic development, for example by quoting their contribution to the rise of the Asian "tiger economies," grass-roots evidence suggests a more multidimensional, context-specific nature of both poverty and development and their relationship with ICTs. ICTs are not always deployed by their users directly for economic functions. Often they are used for social purposes or for education. Sometimes such impacts contradict the simplistic notions that technology can result in predictable outcomes through a process of linear causation (Parkinson and Ramírez, 2006). As Richards (2004) says, ICTs represent a crucial force for cultural change. Leaning (2005) argues that ICTs have different modes of use, that they are a socially contingent means of communicating information and that the Internet is to be seen as a modality of cultural transmission.

This paper investigates how ICTs have socially benefited a community of indigenous people in a rural and isolated area. We will evaluate the different uses and impacts of media in contributing to rural development by reporting research that was conducted in a community in Sarawak, East Malaysia. Sarawak, a former British colony, joined with Malaya, Sabah, and Singapore, to form the federation of Malaysia in September 1963. Malaysia is a multi-ethnic, multicultural and multilingual society. The Malays form the largest community and play a dominant role politically. Their language, Malay (Bahasa Malaysia), is the national language of the country. The research investigated the comparative influence of ICTs and social contacts on the processes of cultural transmission to schoolchildren; how they learn about their indigenous culture and about their national Malaysian culture.

2. BACKGROUND

2.1 Indigenous Peoples

There is no single agreed definite of indigenous peoples, also sometimes referred to as ethnic or minority groups. However, they are generally regarded as those that have historically belonged to a particular region or country before its colonisation by outsiders and/or transformation into a nation state (UN, 2004 and ILO, 1989). One aspect of the modern understanding of the term 'indigenous' comes from the indigenous peoples themselves. To be indigenous, self-identification must be made at an individual level. Once an indigenous person has accepted they are indigenous, a level of acceptance from the community must be made (World Bank, 2003).

The International Working Group for Indigenous Affairs (IWGIA) claims there are at least 5,000 indigenous peoples worldwide, ranging from the forest peoples of the Amazon to the tribal peoples of India¹. The United Nations Permanent Forum on Indigenous Issues reports that there are more than 370 million indigenous people in some 90 countries, and estimates that 70% of them reside in Asia. Of these, more than 30 million live in South East Asia, more than 50 million in India, and more than 70 million in China². Indigenous communities often have a different culture, language, lifestyle and traditions compared to the national mainstream society.

Despite their numbers, development for indigenous peoples remains problematic. The World Bank has reported that whilst indigenous and tribal peoples represent 5% of the world's population, they account for more than 15% of the world's poor (World Bank, 2003). Historically, indigenous peoples have faced a range of development challenges that have left them among the world's most disadvantaged people (Healey, 2008). In some places,

¹ http://www.iwgia.org/

² UNPFII; http://www.un.org/esa/socdev/unpfii/index.html

indigenous groups have been wiped out completely due to over-development, deforestation, organised extermination/genocide and/or assimilation and disease (Madeley, 2004).

Following more than twenty years of discussion and drafting, the UN Declaration on the Rights of Indigenous Peoples was adopted by the General Assembly in 2007 (UN 2007). The Declaration emphasises the need for indigenous peoples to have rights over their land and to allow them to maintain their culture and traditions and to pursue development in their own ways. It allows indigenous groups to draw attention to their cultures and traditions and to ask for support to decrease the discrimination they face. By endorsing the Declaration, the majority of world leaders expressed a positive attitude to help protect their country's indigenous groups. Malaysia voted in favour of the Declaration and it has generally been accepted and welcomed by indigenous peoples themselves. However, the challenge is now to ensure that these rights are actually realised by the indigenous peoples for whom they are intended.

2.2. Cultural Transmission

Indigenous peoples usually attach great importance to their own culture. Kroeber and Kluckhohn (1952) explain that culture consists of patterns, explicit and implicit, of behaviour acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts. Hofstede (1984) describes it as the collective programming of the mind which distinguishes the members of one category of people from another. Culture can change, and constantly does so through the generations whilst traditions are handed down in order for things to be done in the same way. Tradition is seen as the internal handing on through time of cultural traits (Kroeber, 1948). Accordingly, the transmission of indigenous culture to the younger generation is of considerable interest and importance as it relates to whether or not the culture will survive pressure for assimilation into mainstream society.

Cultural transmission is the process of passing down tradition in order to preserve a culture. It embodies the passing on of culturally relevant knowledge, skills and values from one person to another person or from one culture to another culture. Culture is not passed on biologically or genetically, but rather it is learned through experience, participation and observation within the community (Bisin et al., 2005). Indigenous communities often strive to retain their traditions and they practice them with pride as a way of retaining their identity. Therefore, cultural transmission plays an important role in retaining the cultural norms of communities. There are many channels by which cultural knowledge and values can be transmitted and increasingly, media channels, including new media, are playing this role.

2.3 New Media in Rural Communities

Access to ICTs for rural communities in the developing world is becoming increasingly available through community telecentres. These are publicly shared premises where members of the public can access information and communication technologies (Colle and Roman, 1999). They are different to cyber cafes as their purpose is to act as an aid for local development. Telecentres have different functions and provide access to different types of media. Many have the ability to provide Internet connections, telephones, printing, fax and photocopying services. They are often provided by aid agencies and NGOs to help with local development, usually relating to agricultural productivity, education, enterprise development, health care and cultural and social activities.

In addition to computers and the Internet, mobile phones are making rapid and widespread inroads into developing countries. The ITU reports that mobile cellular penetration in developing countries reached an estimated 57 units per 100 inhabitants at the end of 2009, more than double the rate of 2005, when it stood at only 23 per cent (ITU,

2010). Mobile phones not only provide communication between individuals but also with Internet. There is a range of emerging applications for mobile phones such as banking and funds transfer, e-mail, health care, market information and weather alerts (Abraham 2007). As urban areas become saturated with mobile phone access, operators are expanding their markets by providing services to the under-served rural areas, sometimes with government support, and these are beginning to reach even the most isolated and remote locations.

In addition to mobile phones, community radio stations are beginning to spread throughout the developing world in support of local development. UNESCO has reported that there are over 20,000 radio stations worldwide and more than 2 billion radio receivers (UNESCO, 2001). Community radio stations broadcast services with a limited geographical reach and are run by the local community, broadcasting content concerning issues that interest them, such as local news and entertainment. They are used to raise local awareness of development activities, foster debate on issues of local concern and to disseminate information in support of local development. They broadcast topics that mainstream media consider too narrow for a national audience, and often this is in a minority language that is under-served by national broadcasts.

As the information society spreads, ICTs have become acknowledged as the principal form of communication among and between individuals, communities and society at large. They are also recognised as a means of delivering new forms of development to rural areas that have previously been under-served by the traditional channels of communication (UNESCAP, 2007). This has raised issues concerning how rural communities accept new media, especially those isolated indigenous and ethnic minority groups who, when provided with access to contemporary ICTs, face a barrage of information and cultural influences that they have not experienced before.

2.4 Indigenous Communications and Media

As many indigenous peoples live in isolated rural areas, they lack convenient access to development support and to the means of communication that can provide such support. Even when such access is available, the media content often fails to address the specific needs and aspirations of minority cultures, in many cases just because it is broadcast or printed in a language that is not their mother-tongue. The importance of media within indigenous communications is emphasised in the UN Declaration Article 16, which states that indigenous peoples have the right to access media in their own language without discrimination and to use media to reflect on cultural diversity. Indigenous communications and media are services that are run purely by indigenous peoples for themselves. They include radio broadcasting, telecommunications (telephones and Internet connections), printing, film, video, television and other forms of visual communications. Indigenous peoples need indigenous communications and media for (Harris, 2007):

- Influencing government decisions that affect them
- Countering non-indigenous mass media
- Fostering self-help organisations
- Sharing information
- Communicating trans-nationally between sub-groups
- Preserving indigenous knowledge
- Protecting intellectual property rights

Indigenous media offer an opportunity for indigenous peoples living in remote rural locations to bridge the digital divide that exists between them and their compatriots in urban mainstream society.

2.5 Bridging the Digital Divide in Bario, Malaysia

Malaysia has a population of 24 million people and is regarded a middle-income developing country. It has embraced the use of ICTs for the purpose of national development, for example by creating the Multimedia Super Corridor, a Government designated zone designed to leapfrog Malaysia into the information and knowledge age in support of its Vision 2020, by which the nation intends to attain fully developed status³. The Government has also embarked upon programmes for establishing community telecentres throughout the country⁴. However, despite these national plans to bridge the digital divide, there remain large sections of the population that still do not have access to ICTs, including for example, many of the indigenous peoples living in remote locations in East Malaysia.

Malaysia has a multi-ethnic population consisting of 50% Malays, 24% Chinese, 11% Indigenous people, 7% Indians and 8% others⁵. East Malaysia is geographically separated from Peninsular, or West Malaysia, across the South China Sea. The two East Malaysian states of Sabah and Sarawak comprise the western and northern sections of the island of Borneo. They are characterized by ethnic pluralism. Sabah has an indigenous population that makes up approximately 60% of the state's population. The majority live in the rural areas and there are more than 30 different indigenous groups, including Kadazan, Dusun, Rungus, Murut, Sungai and Lundayeh. They speak more than 50 languages and 80 dialects. The indigenous peoples in Sarawak make up around 50% of the state's population. Officially, there are 28 indigenous groups including Iban, Penan, Kenyah, Kayan, Kelabit, Ukit, Sekapan, Lahanan and Punan Bah⁶. This paper focuses on an indigenous group living in the state of Sarawak, East Malaysia: the Kelabit.

2.5.1 The Kelabit

The Kelabit People have traditionally been rice farmers living in multi-family longhouses in the upland areas of northern Sarawak. The Kelabit Highlands has the largest remaining rural concentration of Kelabit people, with roughly 1,000 individuals scattered around a dozen distinct communities. The majority are located within a day's walk of Bario, the regional centre of commerce and education and home to government services such as the police, clinic and the airstrip (Amster, 2006). Most of the other estimated 4,000 Kelabits now live in the urban areas of Malaysia. The Kelabit People comprises one of Malaysia's smallest ethnic groups but they have a distinct language and culture which they are anxious to preserve⁷. The main spoken language in the area of Bario is the Kelabit language.

As an indicator of the situation facing the members of the Kelabit community who are concerned with the survival of their language, the researcher witnessed a birthday party for an 80-year old resident of Bario at which her grand-daughter, a teenager living in the town of Miri, gave a short speech and apologised that she had to speak in *Bahasa Malayu* (the Malay language), which her grand-mother does not speak well, because her Kelabit was not good. Bario is situated at approximately 3,280 feet above sea level deep within the rainforests of the Kelabit Highlands of Borneo. It is isolated and until the establishment of the e-Bario community telecentre in 2002, it lacked modern communications. Access is by a 55-minute flight from the coastal town of Miri in a small plane operated by the rural air service of

³ http://www.malaysia.gov.my/EN/Relevant%20Topics/IndustryInMalaysia/Business/ICT/MSC/Pages/MSC.aspx

⁴ For example, the programmes for *Pusat Internet Desa* (http://www.pid.net.my/) and *Medan InfoDesa* (http://infodesa.gov.my/)

⁵ CIA The World Factbook, 2004 estimate; https://www.cia.gov/library/publications/the-world-factbook/geos/my.html

⁶ From IWGIA; http://www.iwgia.org/sw18358.asp

⁷ See http://www.kelabit.net/kelabits/kelabits.html

Malaysian Airlines. It has also recently become accessible by a hazardous 14-hour car journey on an un-sealed logging road from Miri. There are no mains electricity supplies but there is widespread use of household generators and solar-panels.

2.5.2 *e-Bario*

e-Bario is a multi-award winning initiative implemented by the University Malaysia Sarawak. It has brought telephones, computers and the Internet to Bario, in the form of a community telecentre and computer laboratories at the two schools⁸. It has been described as one of Malaysia's most significant Internet development projects (ITU, 2006). The purpose of the project has been to demonstrate how ICTs can contribute towards locally-directed development in a remote and isolated community. Apart from greatly enhanced social communication, the project has resulted in increased computer literacy among the students, teachers and the community, faster response to emergencies, improved public health and job creation and increased revenues from tourism (Yeo et al., 2007).

In 2006, the e-Bario telecentre was handed over to the Bario community by the implementers and it has been operated since by a local private company called e-Bario Sdn Bhd. The company has been instrumental in the promotion and implementation of a range of development activities that have deployed ICTs to the benefit of the Bario community. Both the company and the project continue to evolve jointly within the socio-economic dynamics of the community, giving rise to a range of outcomes, many of which were not foreseen. Harris and Tarawe (2009) highlight some of these in pointing out for instance that whilst it has attracted residents back into the community, the benefits of the telecentre have not been evenly distributed. However, the centre played a crucial role within a national search and rescue emergency and it has helped preserve community memory by recording important cultural information, as well as attracting further external resources into the community. e-Bario Sdn Bhd continues to expand the services of the telecentre in support of localised development. The company has recently been awarded Malaysia's first license to operate a community radio station, which will serve to extend the information services of the telecentre into the homes of the residents, with support from the International Fund for Agricultural Development (IFAD), under its Indigenous Peoples Assistance Facility (IPAF). By broadcasting programmes in the Kelabit language it is expected that this facility will contribute to its preservation, an aim that has become important to the Kelabit People.

3. METHODOLOGY

The research examines the contribution that ICTs in Bario have made to the social development of its indigenous ethnic residents, the Kelabit. It focuses on the influence of ICTs in transmitting their unique culture and traditions to the younger generation of Kelabit children and young people and compares it with influences from the more traditional sources of influence. Figure 1 depicts the variables examined and their postulated relationships.

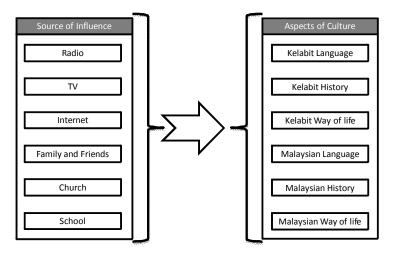
The research was based on structured interviews based on a questionnaire with Kelabit children and young people in Bario (see Appendix 1 for the questionnaire). Questions were designed to assess the relative strengths of the influences indicated in Figure 1. The questionnaire format was adopted in order to simplify the responses for the children. They were asked to rate each source of influence on each aspect of culture on a scale from; '1' for little influence, '2' for some influence and '3' for a lot of influence. Twenty-six children and young people were interviewed. An interpreter assisted with the questioning; a seventeen year old female secondary school pupil who had been brought up in Bario. She speaks

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⁸ See http://www.ebario.org/ebario-telecentre.html

English and the local Kelabit language and was able to help with any translation when the respondents did not understand the question. Consent to conduct the interviews was obtained from the children's parents, the school teachers and the school principal, to whom the purpose of the research was explained.

Figure 1
Influences on Cultural Learning



4. RESULTS

4.1 Demographics

Of the twenty-six respondents interviewed, fifteen (58%) of them were male and eleven (42%) female. The majority (19 children, 73%) were aged fifteen and under and the mean age was 14 years (Figure 2). All but one of the respondents attended school in Sarawak, Malaysia with one respondent attending boarding school overseas in the UK (Figure 3).

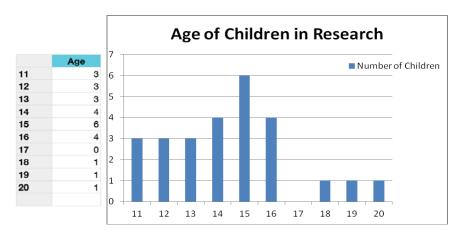


Figure 2 Age of Respondents

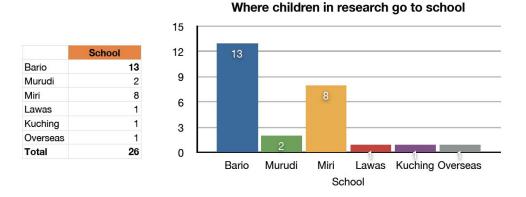


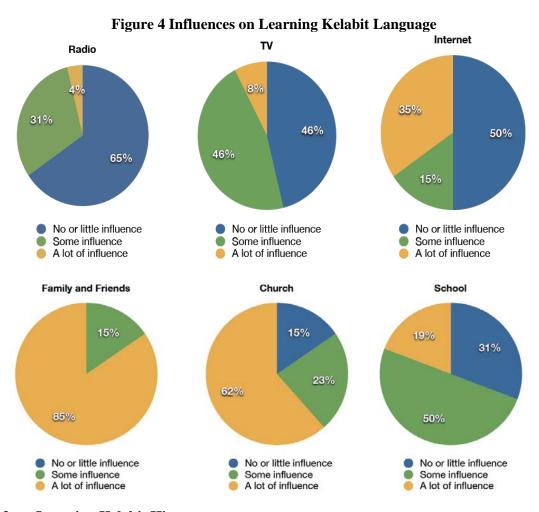
Figure 3 Where the Respondents Attended School

4.2 Learning the Kelabit Language

Table 1 summarises the responses on influences of learning the Kelabit language. Figure 4 depicts the relative influences graphically. Among the technologies, the Internet was reported as having the most influence with 35% of respondents reporting a lot of influence on their learning of Kelabit language, but 50% reporting no or little influence. 85% felt that they mainly learn their Kelabit language from family and friends and 63% felt that attending church has a lot of influence on their learning of Kelabit language. Of all respondents, none felt that family and friends have no or little influence. Of all respondents, 19% felt that attending school has a lot of influence on their Kelabit language.

 $Table \ 1$ How much influence do the following have on the learning of Kelabit Language?

Kelabit Language	Radio	TV	Internet	Family and Friends	Church	School
No or little influence	17	12	13	0	4	8
Some influence	8	12	4	4	6	13
A lot of influence	1	2	9	22	16	5



4.3 Learning Kelabit History

Table 2 summarises the responses on influences of learning the Kelabit history. Figure 5 depicts the relative influences graphically. The results indicate a low response for the technology in learning about Kelabit history. 73% felt that the radio has no or little influence on their learning of Kelabit history, 35% for TV and 46% for the Internet. TV and Internet proved more beneficial than radio received, which none of the respondents rated as having a lot of influence.

As with language learning, social interactions proved to have the most influence on the learning of Kelabit history, especially through family and friends, with as 81% of respondents regarding it as having a lot of influence. Of the strongest influences, respondents reported attending church as having has more influence (38%) than attending school (15%) on learning about their Kelabit history.

Table 2 How much influence do the following have on the learning of your Kelabit History?

Kelabit History	Radio	TV	Internet	Family and Friends	Church	School
No or little influence	19	9	12	1	6	10
Some influence	7	12	9	4	10	12
A lot of influence	0	5	5	21	10	4

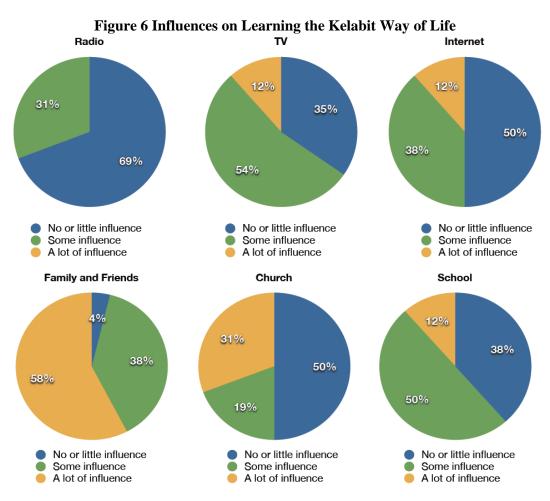
Figure 5 Influences on Learning Kelabit History ΤV Radio Internet 19% 19% 35% 46% 73% No or little influence No or little influence No or little influence Some influence Some influence Some influence A lot of influence A lot of influence A lot of influence Family and Friends Church School 15% 23% 38% 38% 46% 81% No or little influence No or little influence No or little influence Some influence Some influence Some influence A lot of influence A lot of influence A lot of influence

4.4 Learning the Kelabit Way of Life

Table 3 summarises the responses on influences of learning the Kelabit way of life. Figure 6 depicts the relative influences graphically. The results indicate a low response for the technology influences with for example, 69% of respondents reporting that radio has no or little influence. As with language and history, social interactions were regarded as having greater influence on learning about the Kelabit way of life. More than half (58%) of the respondents felt that family and friends have a lot of influence on the learning of their Kelabit way of life. 31% rated the attending church as having a lot of influence and 12% for attending school.

 $Table\ 3$ How much influence do the following have on the learning of your Kelabit Way of Life?

Kelabit Way of Life	Radio	TV	Internet	Family and Friends	Church	School
No or little influence	18	9	13	1	13	10
Some influence	8	14	10	10	5	13
A lot of influence	0	3	3	15	8	3



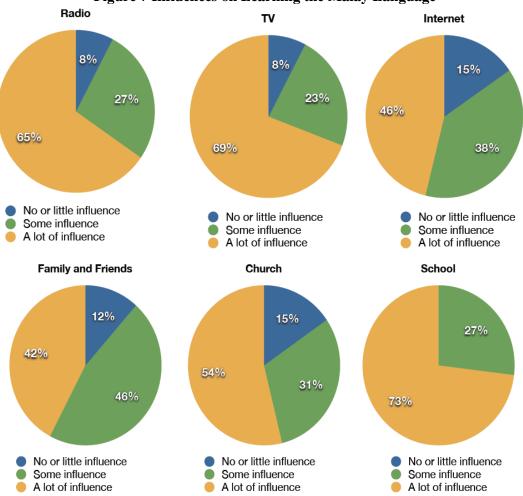
4.5 Learning the Malay Language

Table 4 summarises the responses on influences on learning the Malay language. Figure 7 depicts the relative influences graphically. Compared to learning the Kelabit language, the technology influences are all a lot stronger with 65% of respondents reporting radio as having a lot of influence on learning the Malay language, 69% for TV and 46% for the Internet. 73% of the respondents reported their school as having a lot of influence on their learning of the Malay language, which compares to 19% its influence on learning the Kelabit language. While the church influence is comparable, that of family and friends is much less for the Malay language than for Kelabit (42% and 85% respectively for 'a lot' of influence).

 $Table\ 4$ How much influence do the following have on the learning of your Malaysian Language?

	Malaysian Language: Radio	Malaysian Language: TV	Malaysian Language: Internet	Malaysian Language: Family and Friends	Malaysian Language: Church	Malaysian Language: School
No or little influence	2	2	4	3	4	0
Some influence	7	6	10	12	8	7
A lot of influence	17	18	12	11	14	19

Figure 7 Influences on Learning the Malay Language



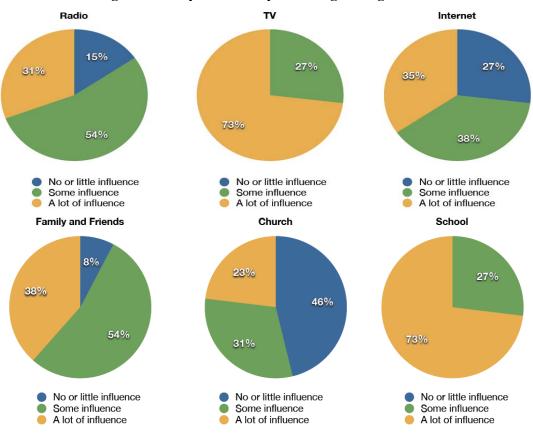
4.6 Learning Malaysian History

Table 5 summarises the responses on influences of learning Malaysian history. Figure 8 depicts the relative influences graphically. 73% reported that TV has a lot of influence and 35% reported that the Internet has a lot of influence, compared to the 38% for family and friends. 46% reported the church as having no influence on learning Malaysian history.

 $Table \ 5$ How much influence do the following have on the learning of your Malaysian History?

	Malaysian History: Radio	Malaysian History: TV	Malaysian History: Internet	Malaysian History:Family and Friends	Malaysian History: Church	Malaysian History: School
No or little influence	4	0	7	2	12	0
Some influence	14	7	10	14	8	7
A lot of influence	8	19	9	10	6	19

Figure 8 Malaysian History Learning through Media

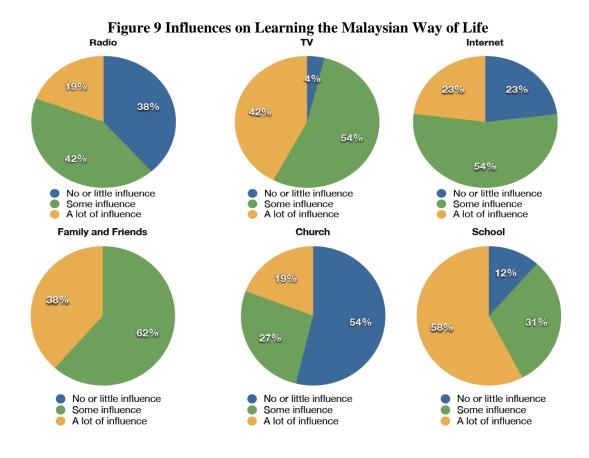


4.7 Learning the Malaysian Way of Life

Table 6 summarises the responses on influences of learning Malaysian way of life. Figure 9 depicts the relative influences graphically. 42% of respondents reported TV has having 'a lot' of influence on their learning of the Malaysian way of life, with 23% for the Internet. The most significant social influences were the school (58% reporting 'a lot' of influence) and family friends (38%).

 $Table\ 6$ How much influence do the following have on the learning of your Malaysian Way of Life?

	Malaysian Way of Life: Radio	Malaysian Way of Life: TV	Malaysian Way of Life: Internet	Malaysian Way of Life: Family and Friends	Malaysian Way of Life: Church	Malaysian Way of Life: School
No or little influence	10	1	6	0	14	3
Some influence	11	14	14	16	7	8
A lot of influence	5	11	6	10	5	15



5. ANALYSIS

In order to compare the results for each channel of cultural transmission and each aspect of culture, the survey responses were assigned values; 'no or little influence' was assigned a value of 1, 'some influence' was assigned a value of 2 and 'a lot of influence' was assigned a value of 3. Each set of values was then compiled against each set of questions, producing the following scores in table 7 which are depicted graphically in Figure 10.

Table 7. Summary Scores

Channel of Influence Aspect of culture	Radio	TV	Internet	Family & Friends	Church	School
Kelabit Language	36	42	48	74	64	49
Kelabit History	33	48	45	72	56	46
Kelabit Way of Life	34	46	42	66	47	45
Malay Language	67	68	60	60	62	71
Malaysian History	56	71	54	60	46	71
Malaysian Way of Life	47	62	52	62	43	64
Total score	273	337	301	394	318	346
Ranking	6	3	5	1	4	2

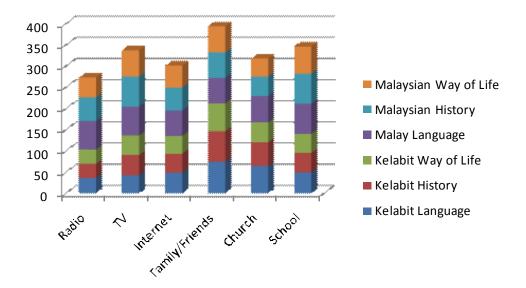


Figure 10 Summary Scores

Additionally, scores were computed for each individual channel of influence and their scores ranked, producing the following rankings in Table 8.

Table 8. Summary Rankings

Channel of Influence Aspect of culture	Radio	TV	Internet	Family & Friends	Church	School
Kelabit Language	6	5	4	1	2	3
Kelabit History	6	3	5	1	2	4
Kelabit Way of Life	6	3	5	1	2	4
Malay Language	3	2	5=	5=	4	1
Malaysian History	4	1=	5	3	6	1=
Malaysian Way of Life	5	2=	4	2=	6	1

6. DISCUSSION

The study examined the influence that ICTs – in the form of radio, TV and the Internet – have on the transmission of the both the indigenous Kelabit culture and Malaysian culture to the younger generation in Bario, comparing it to that of the more traditional social influences. Generally, the picture that emerges indicates that social influences are the strongest in transmitting both cultures, but TV is also important. Family and friends have the strongest reported influence overall, with the school ranking second and TV third. On closer examination however, we see that family and friends have their strongest influence over the transmission of all reported aspects of the indigenous culture whilst the school has its strongest influence over the transmission of Malaysian culture. The second strongest influence over all reported aspects of indigenous culture is the church, whilst the second strongest influence over the transmission of Malaysian culture is TV. Family, friends and the church appear to have a minor influence over the transmission of the Malaysian way of life. Radio and the Internet seem to have a minor influence over the transmission of both cultures.

6.1 Comparative Influences on the Transmission of Culture

Although ICTs have been accessible in Bario for some time, their influence on cultural transmission is patchy. TV has been available for more than 10 years, in the form of satellite transmissions from both Malaysian and Indonesian broadcasters, and radio for longer than that. The Internet was introduced in 2002, including community access and access for the schools. Mobile telephony was introduced in 2010. All technologies are widely accessible, although not necessarily at the household level. Internet access is possible on a daily basis for the children attending school.

Social interactions including church attendance have emerged as the principal means of transmitting the Kelabit culture to the younger generation, having more influence than the media channels. This is expected as written, broadcast or digitised media in the Kelabit language is almost non-existent. The most frequently heard language in the Kelabit households in and around Bario is Kelabit. Church services are almost entirely in Kelabit. Although most school instruction is given in the Malay language, the pupils often use Kelabit to speak among themselves at school.

The Malaysian school system turns out to be comparatively more effective than the other influences in transmitting Malaysian culture, but this is closely followed by family & friends and TV. The difference in influences of the church would be explainable by the fact that Kelabit people mostly follow Christianity whereas Malaysian culture is primarily based on Islam. The influence of TV on the transmission of Malaysian culture stands out, but as there are no Kelabit TV broadcasts, this comes as no surprise. TV appears to be about as influential as the school in transmitting Malaysian culture to the young generation. The Internet is rated to have more influence than radio for the Kelabit culture and slightly less for Malaysian culture. At present, there are no radio broadcasts in Kelabit.

7. CONCLUSIONS

The study findings have some important ramifications for anyone concerned with the long term preservation of the indigenous Kelabit culture. Firstly, although the social influences of family, friends and the church appear to be the strongest for children and young people, their influence wanes as pupils leave Bario for upper-secondary education at around the age of 13 years. Furthermore, in the absence of media content in the Kelabit language, any increased access to ICTs that the move away from Bario might bring about will likely have no compensatory effect on the transmission of Kelabit culture. Secondly, despite the growth in access to ICTs within Bario, their potential impact on the transmission of the traditional Kelabit culture has yet to be felt. Most of the existing Kelabit-oriented websites are in English. One obvious reason for this is the almost complete absence of digital media in Kelabit language. Another reason may have something to do with access to the technology, but this is not generally considered to be a constraint, especially in view of the influence that TV has on the transmission of Malaysian culture.

In Bario, and among the Kelabit people elsewhere, transmission of the Kelabit culture is regarded as the responsibility of parents. Children do not learn Kelabit if their parents do not insist. Where this does not work so well, one result is that old people in Bario cannot converse well with their grand-children who left to get an education and to take up gainful employment in the urban areas. The prospects for Kelabit parents of children born outside Bario to transmit their indigenous culture and language to them would appear to be even more limited if they live outside Bario in a culturally mixed environment where their family and friends are not made up predominantly of Kelabit people. This scenario presents the alarming prospect of possible extinction for the Kelabit language and something similar for the rest of the culture. However, the Kelabit people retain a strong connection to their

homeland and the community is especially anxious to preserve the defining characteristics of their culture, particularly its language.

Despite expanding access to ICTs and the growing use of them, the results of the study indicate that their influence on transmission of Kelabit culture lags behind that of the more social influences of family, friends, and the church. This raises the question of whether it is worth pursuing a strategy of deploying ICTs in support of such a goal; are ICTs ineffectual for cultural transmission or can they made to be more effective? Can they be used to strengthen the role that the social influences already have? On the other hand, turning the question around, with the advancing urbanisation in Malaysia and dilution of indigenous cultures, what are the prospects for the preservation of Kelabit cultural *without* the support of ICTs?

In the absence of any other viable strategy, we argue the case for accelerating the use of ICTs towards cultural preservation for the Kelabit people. At least two prospects present themselves; i) a virtual museum and ii) a community radio station. A virtual museum is a museum that exists only online. Virtual museums include museums that hold art originally created digitally, as well as a museum that takes advantages of the Internet to display digital representations of its collections. These can include multimedia files of photographic images as well as audio recordings of music and voices. The latter are especially relevant in the absence of written materials or historical records in the Kelabit language. The purpose of a virtual museum of Kelabit culture would be to act as a repository of Kelabit culture that would be independent of location, available to anyone with Internet access. With an interactive on-line facility that allowed the parents to contribute their material to the museum, the Kelabit community could combine their resources within an Internet-based Kelabit network and direct their children to it for the guidance they will need in learning about and retaining their indigenous culture.

Community radio is a type of small-scale not-for-profit radio broadcasting, operated by the community themselves and for the good of the members of the community in order to deliver social gain. It can be used to; promote the local culture, particularly languages, music, history, song and verse; mitigate isolation and remoteness; conduct public debate on community issues; and promote economic, educational and health-related activities. As the Kelabit community is already organising activities for promoting and preserving their language, a community radio station could propel this media into the forefront of such efforts by broadcasting programmes of local interest in Kelabit language, as well as onto the Internet. A community radio in Bario would also extend the information services of the e-Bario telecentre into the homes of the residents and by broadcasting in the Kelabit language would increase children's exposure to it. Radio phone-ins using the growing number of mobile phones in the area would contribute to this process. By also broadcasting on the Internet, Kelabit people, especially young people, who have moved to the urban areas can renew and strengthen their relationship with the language, if they wish to, as part of the process of its revitalisation and preservation.

The Kelabit culture is facing extinction but technologies are now at hand that could prevent this from happening. This would involve strengthening the process of cultural transmission from the elder to the younger generations of Kelabit people, using technologies to intensify the social processes that have been shown to be so important. The study has revealed the major influences on this process, highlighting the relative roles of social exchanges and ICTs and suggesting methods for using ICTs to reinforce the transmission of the Kelabit culture to the future generations. The suggested innovations would extend the existing use of ICTs by the Kelabit people fully in the spirit of indigenised media as advocated by the UN Declaration as well as contributing to the preservation of a unique but fragile culture. Moreover, further such use of ICTs can be of equal assistance to Malaysia's

other indigenous groups whose cultures face similar threats and who are largely under-served by mainstream media.

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Appendix 1 Survey Questionnaire Survey Questionnaire on Influences on Cultural Learning School Children

In the following table there is a list of 6 aspects of culture; 3 for Kelabit culture and 3 for Malaysian culture. There are also 4 sources of influence on how you currently learn about each of these aspects of culture. Please consider each source of influence on your learning and score each one according to how influential they are; '1' for little influence, '2' for some influence and '3' for a lot of influence. For example, if you think Radio has some influence on helping you learn Kelabit language; circle the '2' under radio against 'a. Kelabit Language.' And if you think 'TV' and 'Internet' are not influential at all, then circle '1' and if you think 'Family and Friends' are highly influential, circle '3', as follows:

		Influences on Cultural Learning						
	Radio	TV	Internet	Family & Friends	Church	School		
a. Kelabit Language	123	1)2 3	1) 2 3	1 2(3)	123	123		

Now go ahead and enter your own scores in the table below:

	Influences on Cultural Learning							
	Radio	TV	Internet	Family & Friends	Church	School		
a. Kelabit Language	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
b. Kelabit History	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
c. Kelabit Way of Life	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
d. Malaysian Language	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
e. Malaysian History	123	123	1 2 3	1 2 3	1 2 3	1 2 3		
f. Malaysian Way of Life	123	123	1 2 3	1 2 3	1 2 3	1 2 3		