Faculty of Cognitive Sciences and Human Development

Learning at Telecentres: A Study on Indigenising Instructional Design for Communities at Remote Rural Sarawak

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

Disparities among the communities with access to ICT development are especially apparent for those located in geographically remote and rural areas. Governments, agencies, and organisations worldwide have rolled out various ICT-related projects, with telecentres being the most widely adopted and deployed model in developing countries. Although many learning activities have been implemented at these telecentres for the communities they serve, most of the literature has focused primarily on user acceptance, human development, sustainability, telecentre performance, and impact assessment, rather than the delivery of learning and training activities at the telecentre. By first studying the initial ICT literacy training programme at the telecentres, the study focused on examining the potential to build culturally inclusive instructional design and how it could stimulate knowledge sharing and co-creation among indigenous community members. The study then examined how a community-led learning programme was implemented at two research sites, focusing on culture-based aspects that were not adequately considered in ICT literacy training programmes, such as culturally-specific instructional strategies, culture-specific assessments, and a focus on cultural artefacts, history, and knowledge. The study also looked into the benefits of using an indigenous instructional design at these telecentres, and self-determination theory was used to see how well the indigenous instructional design could satisfy the three psychological needs of autonomy, competence, and relatedness to strengthen intrinsic motivation. The study also examined the role of telecentres today in supporting the learning needs of indigenous communities, especially in fostering knowledge sharing and co-creation.

Document data, interview data, and observations were retrieved from informants who were members of project teams that initiated ICT literacy training and a community-led learning programme at selected research sites in Sarawak, as well as indigenous communities that participated in the training and learning programmes. Findings from the interview data highlighted that the indigenous communities revealed a need for a learning environment that catered to their needs as indigenous learners rather than one that suited more formal settings. It also showed that when these cultural aspects were purposively included in the instructional design model, the motivation to share and co-create knowledge was strengthened, indicating the value of using an indigenised instructional model. The study identifies critical considerations for effectively implementing learning and training programmes that would support the basic psychological needs and foster learning motivation among the indigenous community members. The study proposes an indigenised instructional design model that adopts a selection of requirements established in previous studies and community feedback.

Keywords: Indigenous communities, indigenised instructional design, knowledge sharing, telecentres, intrinsic motivation

Pembelajaran Di Telecentre: Kajian Mengenai Reka Bentuk Pengajaran Pribumi Untuk Komuniti Di Luar Bandar Sarawak

ABSTRAK

***J**urang akses kepada pembangunan ICT jelas ketara di antara masyarakat bandar dan mereka yang tinggal di kawasan terpencil dan luar bandar Sarawak. Telecentre merupakan model yang paling banyak diguna pakai di negara-negara membangun yang pernah diusahakan oleh kerajaan, agensi, dan organisasi di seluruh dunia, demi meningkatkan akses dan penggunaan ICT. Walaubagaimanapun, sebahagian besar kajian yang pernah dijalankan untuk mengenal pasti keberkesanan telecentre lebih tertumpu kepada penerimaan pengguna, pembangunan sumber manusia, nilai keberlanjutan, penilaian prestasi fizikal, dan impak kepada masyarakat secara am. Keberkesanan penyampaian aktiviti pembelajaran dan latihan masih kurang diberi perhatian terutamanya dari aspek empirikal. Kajian ini bermula dengan meninjau keberkesanan program latihan literasi ICT sedia ada di lokasi-lokasi sedia ada di Sarawak, dan seterusnya memfokus kepada pembinaan suatu rekabentuk pengajaran yang bersifat inklusif dan peka budaya setempat. Ia merungkai bagaimana rekabentuk tersebut mampu meningkatkan minat untuk perkongsian dan pembinaan pengetahuan dalam kalangan ahli masyarakat orang asli. Kajian ini juga mendalami bagaimana sesuatu program pembelajaran yang diterajui oleh ahli kumpulan masyarakat asli dilaksanakan di dua tapak penyelidikan. Tumpuan diberikan kepada aspek dan nilai budaya dalam proses pembinaan ilmu menggunakan teknologi. Antara konstruk yang diselidiki adalah strategi pengajaran khusus budaya, penilaian bersifat khusus budaya, dan fokus pada artifak budaya, sejarah setempat dan pengetahuan . Kajian ini juga mengenal pasti faedah penggunaan reka bentuk pengajaran ini dari perspektif masyarakat asli sendiri. Teori Self*

Determination telah digunakan untuk melihat sejauh mana reka bentuk pengajaran asli dapat memenuhi tiga keperluan psikologi autonomi, kecekapan, dan perkaitan ilmu yang lazim digunakan untuk mengukuh motivasi intrinsik pembelajaran. Kajian ini juga menilai peranan telecentre kini, dalam menyokong keperluan pembelajaran masyarakat orang asli, terutamanya dalam memupuk perkongsian dan penciptaan pengetahuan secara berkelompok. Data yang dikumpul adalah dalam bentuk dokumen, transkrip temubual dan nota pemerhatian. Data kajian diperoleh dari tiga sumber - ahli pasukan projek yang menggiatkan latihan literasi ICT, ahli masyarakat asli yang menerajui program pembelajaran di tapak penyelidikan terpilih di Sarawak, dan ahli masyarakat asli yang telah menyertai program latihan dan pembelajaran yang dianjurkan. Penemuan penyelidikan menunjukkan pentingnya keperluan persekitaran pembelajaran yang lebih relevan untuk keperluan masyarakat asli sebagai pelajar pribumi. Hasil kajian juga menunjukkan keperluan menitik beratkan elemen dan nila budaya setempat dalam pembentukan model reka bentuk pengajaran yang dibina untuk masyarakat. Program latihan ICT perlu menitikberatkan elemen motivasi yang menggalakkan perkongsian dan pembinaan ilmu pengetahuan membina pengetahuan bersama. Dapatan kajian juga jelas menunjukkan pentingnya pertimbangan kritikal yang keperluan asas psikologi dan motivasi pembelajaran dalam kalangan ahli masyarakat orang asli. Justeru, hasil kajian ini adalah suatu cadangan model reka bentuk pengajaran berasaskan budaya setempat yang peka kepada keperluan masyarakat asli Sarawak. Kajian seterusnya perlu meninjau elemen nilai budaya setempat yang khusus kepada lokasi dan kumpulan etnik Sarawak, untuk mendalami kepelbagaian keperluan psikologi dan motivasi ilmu masyarakat asli.

Kata kunci: *Masyarakat asli, rekabentuk instruksi asli, perkongsian dan pembinaan pengetahuan bersama, motivasi, ICT*

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INTRODUCTION

1.1 Background of the Study

The global technological boom brought to attention not only the advancements in technologies but also highlighted the vast differences between those who had access to this boom and those who did not. As the city dwellers continue to leverage on the development of technology, one of the concerns has been on how to ensure that communities living in rural areas are given similar if not equal access to technology as their urban counterparts. Also known as the digital divide, this gap has been described to be the visible gap between communities that have access to technology and communities that do not; or the gap between those who use digital technologies and those who do not (Ndeta, 2003; Tinio, 2003, Hargittai & Hinnant, 2008; Perrin, 2019; Beaunoyer et al., 2020; Lai & Widmar, 2021). The evolution of this concept has been observed over the years, as the first level of the digital divide was seen to focus on connectivity before the focus shifted towards the concern of the development of skills and abilities required to use Information and Communication Technology (ICTs), which was recognised as the second level of the digital divide. The third level of the digital divide looked at measuring the tangible results of using the Internet (Scheerder et al., 2017). Today, there are many studies examining the digital divide phenomenon (Scheerder et al., 2017; Karar, 2019; Hidalgo et al., 2020; Unwin, 2020), all of which have provided a variety of definitions and ways to understand the digital divide in greater detail.

For communities located in geographically remote and rural areas, these disparities are especially evident, as they do not have the necessary infrastructure and exposure to

technology to benefit fully from these technological advancements. The digital divide between communities has also been reported by researchers, who have observed that even in advanced economies, rural and remote communities that are left behind in terms of educational and technological equity and access still exist, and this has led to them facing challenges such as a brain drain of talent, skills, training or development, as well as limitations of distance learning (Oestmann & Dymond, 2001, Hennessy et al., 2016; Thompson, 2020).

As a result of this, governments, agencies, and organisations worldwide sought to improve citizens' living and socio-economic status through the implementation of various ICT programmes that have a strong emphasis on social and economic development (Brown & Grant, 2010; Walsham, 2012). More initiatives were put in place to facilitate modernising the state, such as digitising economies and government services and introducing these interventions to citizens in developing countries (Lin et al., 2015).

Of the many ICT related projects rolled out, telecentres were the most widely adopted and deployed in developing countries (Mukerji, 2010; Pick et al., 2013, Githinji, 2022). Offering access to ICTs for educational, personal, social and economic development (Harris et al., 2003), these telecentres were seen to be a solution to "address the issues of access by providing technology, develop human capacity and encourage social and economic development" (Oestmann & Dymond, 2001, p.3). It was also expected that the establishment of telecentres would support development thrusts and policies and "educational and community development in both rich and poor countries" (Dhanarajan, 2001, p.v). While there have been numerous reports celebrating the success of these initiatives (Gogoi & Saikia, 2020), especially in terms of socio-economic and

communication development, it must be noted that these rural telecentres also face challenges in their operations. Some of these trials include a lack of telecommunication infrastructure, high rates of non-literate users, and users who often have little formal education and little familiarity with information technology (Girardet, 2000). Not much has changed since this report, and these challenges are still visible today, especially in Sarawak. It was observed that a majority of the community members living at the telecentre sites in Sarawak belonged to the older age bracket and had little formal education. They were also not familiar with ICTs, and their responses towards the telecentres reflected this as well.

1.2 Problem Statement

In considering this observation, the delivery of learning and training activities should be a focus of the telecentres, especially when the delivery of various ICT literacy training, e-learning activities, and other offline learning activities are conducted within these spaces. Interestingly enough, while the telecentre has served as a space for its users to engage in learning activities, existing literature has focused mainly on **user acceptance** (Abdul Razak & Abdul Malek, 2008), **effectiveness in terms of infrastructure and number of users** (Amariles et al., 2006; Hassan & Megat Tajuddin, 2010; Ibrahim et al., 2011), **human development** (Cecchini & Raina, 2004; Mathur & Ambani, 2005; Ibrahim et al., 2015), **sustainability** (Ernberg, 1998; Harris, 2001; Hudson, 2001; Hassan & Megat Tajuddin, 2010; Abdul Malek et al., 2014), **management** (McConnell, 2001; Hanna, 2010; Ibrahim et al., 2010; Chew et al., 2013), **financial** (McConnell, 2001; Abdul Razak & Abdul Malek, 2008; Ibrahim et al., 2010) **telecentre performance and impact assessment** (Earl & Carden, 1999; Whyte, 1999; Wakelin & Shadrach, 2001; Amariles et

al., 2006) as well as **evaluation planning and guidelines** (San Sabastian, 1999; Contreras-Budge, 1999; Scharffenberger, 1999; Hudson, 1999; Whyte, 2000).

While training at the telecentre has been emphasised by many authors (Baron, 1999; Dahms, 1999; Macome & Cumbana, 2001), assessment and evaluation of learning at the telecentre have yet to be fully explored in the literature. Primarily, investigations into the design and development of training and teaching programmes conducted at the telecentre have not been adequately addressed empirically, as existing reports indicate the type of activities performed but not the specific instructional design used. Baron (1999, p. 40) observed that there are some "shortcomings and limitations in the methodologies and instruments used in the training processes" and that "perspectives that went beyond technical training and matters related to the use of new technologies" should have been included in the rollout of the training. Baron went on to say that other essential tools that could have assisted with introducing new users to new technologies and methodologies that could help users develop an independent capacity to build on their knowledge base to resolve problems are seen as necessary when establishing a telecentre. The example of the community at Kerigma was highlighted. These community members experimented with activities, games, and more participatory approaches to collectively build knowledge, emphasising the need to cater to the community's unique characteristics. These observations indicate a necessity to look into how training is designed and developed for users at the telecentre, especially for the particular needs and characteristics of the communities involved.

As earlier identified, there is limited empirical evidence emphasising the instructional design used when planning training sessions at telecentres. A report by Juan

et al. (2010) sheds some insight into this, describing that the training modules used to deliver the ICT literacy programme were based on the ADDIE model of instructional design. The ADDIE model is a widely used instructional design framework that emphasises five phases of instructional design: Analysis, Design, Development, Implementation, and Evaluation and is primarily used by educators when developing instructional content. A reason why the ADDIE model was chosen for the ICT literacy training is because the trainers could use the information gained during the analysis stage to advise the development of the modules for the communities. Aside from that, the team also used Bloom's Taxonomy, a hierarchical ordering of cognitive skills, to address which levels of competency the users should achieve (Juan et al, 2010). While the report does mention the usage of these frameworks, it does not detail if the use of both the ADDIE model and Bloom's Taxonomy were efficient in addressing the learning needs of the indigenous communities.

Coming back to the observation that many of the telecentre users have little formal education, it is pertinent to consider that these users are accustomed to informal learning conducted within the community. Indigenous communities have their own ways of learning within a community, as evidenced by the learning practices of indigenous communities around the world (Bates et al., 2009; UN, 2019). Research has also shown that indigenous community members do not thrive in learning environments that do not include their learning styles and preferences, as reported in studies conducted with indigenous communities (Salleh & Ahmad, 2009; Hogue, 2012; Abdul Wahab et al., 2013; Wong & Osman, 2016; Buxton, 2018; Rosnon & Abu Talib, 2019). Findings in the literature regarding this subject have primarily written that these indigenous students often fall out of the education system, and felt like they did not fit in with the system due to a

lack of familiar cultural supports, making the stress of education even more overwhelming (Jessop & Williams, 2009; Leonard & Mercier, 2016; Milne, 2016; Olsen Harper & Thompson, 2017). Other factors contributing towards the higher dropout rates of indigenous learners in school include institutional, faculty, and student racism (Hardwood et al., 2012; Jain & Crisp, 2017) and academic weakness (Scholfield et al., 2013; Marshall et al., 2015; Powless, 2015; Olsen Harper & Thompson, 2017).

Empirical studies in Malaysia have also reported low motivation among indigenous students to perform in school (Salleh & Ahmad, 2009; Shaari et al., 2011; Abdullah et al., 2013; Abdul Wahab et al., 2013). Identified factors contributing towards low motivation levels of indigenous learners include indifference and lack of awareness among parents about the importance of education for their children (Wong & Osman, 2016). It was observed that existing programmes and initiatives catered for indigenous learners undertaken by both the Ministry of Education and schools in Malaysia still do not show good and lasting results as the motivation levels of indigenous learners have yet to be considered satisfactory. The worrying state of low motivation levels among indigenous learners has also been highlighted by international researchers from countries such as New Zealand, Australia, Canada, and the United States (Deyhle, 1983; Charleston, 1988; Cajete, 1988; Masters, 2009; Bishop, 2010; Chigeza, 2011; Anderson R., 2014).

These low motivation levels reported of indigenous learners indicated a need to examine existing practices in teaching and learning and how this can be enhanced to strengthen the motivation levels of indigenous communities. Although numerous studies on improving intrinsic motivation within academic spheres have been conducted (Gottfried et al., 2001; Fredrick & Eccles, 2002; Hong et al., 2009; Walker & Greene, 2009; Ryan &

Deci, 2020, literature on improving intrinsic motivation among indigenous communities in informal learning spaces such as the telecentre is still limited and can be explored further.

There has also been an increased interest and call for research into culturally sensitive instructional design over the years, with investigations being conducted on how to engage indigenous and minority races (Henderson, 2009; McLoughlin & Oliver, 2010; DeLorme, 2018). Similarly, the work done by Young (2009) brings to attention the need to use culture as a design construct. Young introduced the Culture-Based Model ID-TABLET (CBM ID-TABLET) framework, incorporating twenty-five cultural elements with 70 design factors tied to these features. Through this framework, Young proposed that using culture as a design construct would result in an instructional design that is more representative of users' cultures, as their needs and wants could be adequately addressed.

The adoption of a culturally-based instructional design framework can be seen to be appropriate in Sarawak. The state boasts of a multi-ethnic community and is home to over 20 different ethnic indigenous groups, some of whom still reside in parts of Sarawak's most remote and rural locations. These indigenous communities have rich cultural and traditional identities specific to each ethnic group. Over the years, numerous research has been conducted with these indigenous groups (Callison et al., 2021; Hausknecht et al., 2021), and in line with indigenous research methodologies, it was only pertinent that considerations be given to the needs and protocols of these communities. Such was an approach taken by a research group in Universiti Malaysia Sarawak (UNIMAS), which sought to bring ICTs to some of Sarawak's most remote and rural locations. Through their work with the rural communities in the Sarawak Highlands, a model known as the CoERI model was developed. The CoERI model brought together researchers from multiple

disciplines and made up four research clusters; cultural and social, technology infrastructure, development and services, and information and research management (Yeo et al., 2012). These clusters enabled the researchers to elicit meaningful change to the indigenous communities as the clusters focused on the specific needs according to the different phases of the project. Beginning with the needs analysis stage, the CoERI Model also looks at planning and design, technology access and deployment and finally, the evaluation and reflection stages of the project, as is illustrated in Figure 1.1.

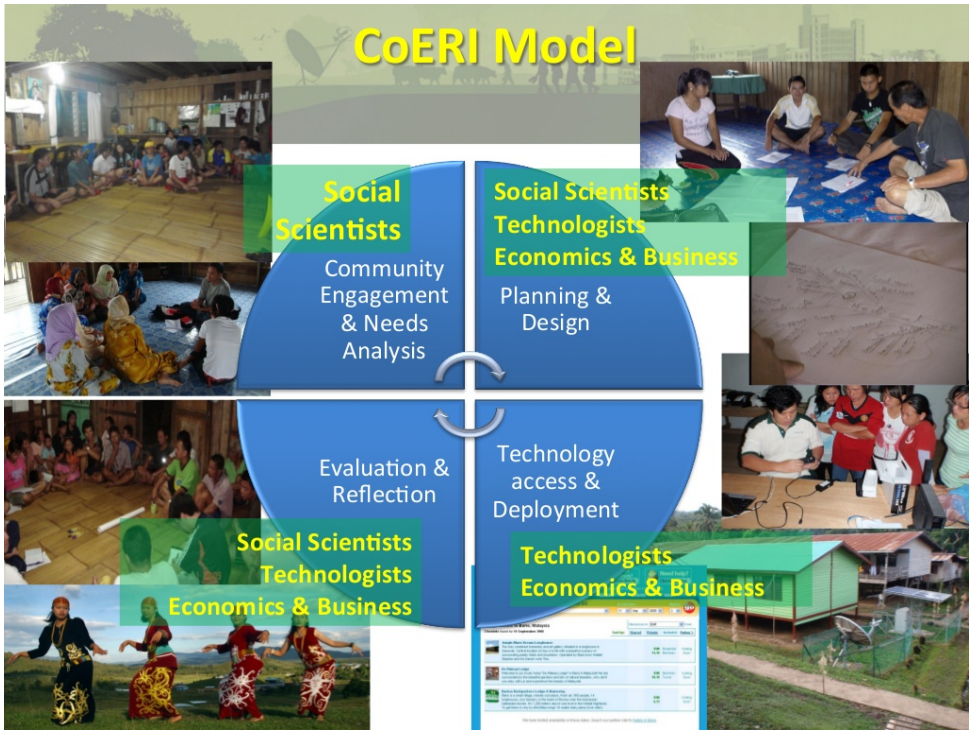

Figure 1.1: CoERI Model for telecentre projects

Although the adoption of the CoERI model into the rollout of the telecentres at the research sites in Sarawak specify that the project teams had taken the needs of the communities into consideration by making them an integral part of the project and ensuring that the rollout was adaptable enough to include local context within which the

model is being replicated (Yeo et al., 2012), the model appears to focus more on the project management aspects rather than the learning aspects of the telecentre rollout.

Given this, the current study aims to investigate the usage of the existing instructional design model at the telecentres in Sarawak and if the current approach used was representative of the needs of the indigenous communities involved. Specifically, this research will explore if the existing approach could foster meaningful learning experiences for the users, especially in terms of the motivation to share knowledge and co-create knowledge among telecentre users. Using the CBM ID-TABLET as a guiding framework, the study will also investigate if the use of an indigenised instructional design in the rollout of a community-led MOOC programme can contribute towards strengthening knowledge sharing and co-creation among indigenous communities before discussing how technologies can be adapted to suit the needs of indigenous communities, especially in Sarawak.

1.3 Research Motivation

Like in many other countries, both developing and developed, Malaysia's digital / ICT infrastructure development has concentrated primarily in its cities and towns (Mohd Noor & Kassim, 2007; Darus, Mohd Ariffin, Jalil, & Mohd Yusof, 2021; Surianshah, 2021). Digital infrastructure distribution on a geographical basis has mainly reflected regional inferences in economic development and population density, with the predominantly rural states of Sabah and Sarawak falling far short of the national average, which further highlights a disparity between the digital / information-rich and the digital/information poor in Malaysia (Mohd Noor & Kassim, 2007; Darus, Mohd Ariffin, Jalil, & Mohd Yusof, 2021; Surianshah, 2021).

In recognition of the digital divide issue in Malaysia, several steps have been put in place by both the Malaysian government and private sectors to enhance digital literacy in these areas, such as to create awareness among the rural population and to provide the infrastructure to the rural regions (Mohd Noor & Kassim, 2007). Initiatives to bridge the digital divide in underserved areas by offering basic Internet access and ICT training to the members of these communities in Malaysia are evidenced by the establishment of Medan Info Desa, Pusat Internet Desa, Community Broadband Centres, and the Pusat Internet 1Malaysia. Currently, while internet penetration has increased among communities in Malaysia, communities in underserved areas are still lagging behind their counterparts (Commission, 2021).

ICT penetration has been particularly challenging in Sarawak due to its vast size and terrain. Many communities living in the more geographically remote locations of the state have yet to fully benefit from internet and ICT developments that are on par with those living in the urban areas. In 2012, Sarawak ranked at the third-lowest household broadband penetration of all the Malaysian states at 47.5%. Not much has changed over the years, as it was reported that many areas in Sarawak have yet to receive comprehensive and stable communications coverage, especially in rural areas (Sulaiman & Halamy, 2021).

These low penetration numbers indicate that many individuals in the state have lower ICT literacy or knowledge, especially those in remote and rural locations. Interventions by the government and agencies have also been initiated in the state, most notably the telecentre initiative spearheaded by a research team at UNIMAS, which sought to bring ICTs into the hinterlands of Sarawak. Through the project, three telecentres were established in the Kelabit Highlands of Bario (eBario), the Lun Bawang village in

Ba'Kelalan (eBa'Kelalan), and the Penan settlement in Long Lamai (eLamai) (CoERI, 2010).

Since the inception of eBario in 1997 and the replication of the eBario model in Ba'Kelalan and Long Lamai, these telecentres have received both national and international recognition, evidenced by the numerous awards and mentions received by all three telecentres. The eBario telecentre in Sarawak has also been central to implementing multiple award-winning community-based projects, highlighting that with the right project and community buy-in, projects can be both successful and sustainable. Various studies have also been conducted to evaluate the impact these telecentres have had on the community, particularly in socio-economic development. It has been reported that the communities experienced growth in terms of their socio-economic status and their communication patterns (DAGS, 2010).

Although the telecentre has brought about significant impacts on the communication and economic livelihoods of the community members, another aspect of the telecentres in Sarawak that has yet to be sufficiently addressed in the literature; the learning experiences of the indigenous communities at the telecentre, particularly in terms of the design and delivery of the learning activities conducted there. Undoubtedly, every telecentre will engage the community in learning activities, such as ICT literacy training, human capital development training, and e-learning. Similar to what has been observed in international literature, the design and delivery of these training programmes among the communities in Sarawak were rarely discussed in local literature. As most of the reported research has emphasised on assessments and evaluations rather than on the learning experiences at the telecentre, this was indicative of a gap in the existing local literature.

Current literature on learning experiences is derived from service-learning programmes (Vogelgesang et al., 2002; Petkova, 2017; Levkoe et al., 2020), learning abroad programmes (Gearing et al., 2020), and from within classrooms (Tomlinson, 2015; Nel, 2017). Researchers have reported that some of the impacts experienced by learners are changes in their critical thinking, knowledge acquisition, and inter-cultural competence. Oliver and Harvey (2002) observed that learning impacts are commonly framed to include behavioural changes, skills, or attitudes. Learning motivation has also been noted as an impact of learning. Individuals use motivation to improve their skills, gain more knowledge, and record changes in behaviour in terms of knowledge sharing, knowledge hiding, and the co-creation of knowledge.

In trying to establish if the community members had experiences sharing knowledge and co-creating knowledge with one another when using the telecentre, casual conversations with the community at Bario were held to learn more about their usage patterns and their user experiences at the telecentre. Using these conversations and observations as a guide to the direction of the research in its initial phase, this study sought to gain a deeper understanding of the community's perceptions of the telecentre. Conversations with the community members revealed that they were all largely appreciative of the establishment of the telecentre. They informed that usage of the telecentre during its heyday was limited to mainly communicating with family members who were not living with them and conducting economic activities such as promoting their homestays and other traditional products they have for sale. Findings in the literature have also echoed these statements, with reports noting that activities at the telecentre centred primarily around the usage of Facebook, email, and other social networking platforms, all

of which were used to communicate and promote their services to the general public. (Alao et al., 2017; Furuholt & Sæbø, 2017).

The conversations shed light on the usage patterns of the community and how they were first introduced to the subject of ICT literacy by the research team. The dialogues also revealed that they did not particularly feel compelled to share the knowledge they gained from their learning experiences with other community members and would generally not involve themselves in knowledge-sharing activities unless asked to do so. They did not see the need to collaborate with others to co-create knowledge, and neither did they think of using the telecentre to preserve indigenous knowledge at the time. **The reason for this was mainly because they expected to receive information on how to use ICTs the way they were taught and not how to expand the usage of how to use these ICTs through co-creation of knowledge.**

However, it was also informed that all activities ceased when the telecentre could no longer function fully. The community stated that when the telecentre was no longer operating, they accepted that it was no longer there and moved on with their lives, heavily depending on mobile phones and sometimes, the community radio (Samani et al., 2013). Unable to fully operate due to the lack of access to the internet and electricity, the telecentre soon became a memory of the past and is today a white elephant. Conversations with the community members also revealed that efforts to make the telecentre sustainable were also unsuccessful due to the challenges faced by the community in terms of internet connectivity and a stable supply of electricity.

Nevertheless, they told the researcher that while they do have alternatives to connecting to the internet and using communication services, they believed that there was

still a lot of potential in the telecentres and what it can be used for. One of the suggestions put forth was to use the space as a knowledge centre or a learning area to partake in activities that would allow them to share their knowledge with the community, their younger generations, and people visiting their villages. Such sentiments were a stark contrast from what they did at the telecentre when it was operational, as they stated that they were not involved in any activities whereby they would share knowledge with others, co-create knowledge, or do anything in terms of knowledge preservation for the community at the telecentre. These were the initial casual conversations that the researcher had with the community members at one site, which sparked the interest in finding out why these activities were not carried out at the site when the community members themselves expressed that they see value in doing so.

Considering that knowledge sharing within the community is deeply embedded in their way of life and how they learn together, this then led to the question of why were they not sharing their knowledge gained at the telecentre. One of the elders gave some insights into why this happened at the telecentre, which was that the trainings at the telecentre exposed the community to using computers. When asked further on the comment, he mentioned that while it was necessary and exciting to learn about technology because this was something new, it was not something that he found particularly important in his daily life. Such knowledge would only be used at the telecentre, and there was no need to share the knowledge with anyone because they can ask the telecentre managers who knew more about it. Knowledge sharing would only happen if other community members explicitly asked him.

From this, the question of motivation to share the knowledge learnt within the community members emerged. Were the community members motivated to share what they learnt and if they were not, what was the cause of this? Investigations into the level of involvement the community members had at the telecentre, especially in terms of the learning activities there was conducted, with the researcher then proceeding to examine the types of learning activities conducted at the telecentre and the way these activities were designed and delivered, before studying if the existing methods used were suitable for indigenous communities.

In order to better understand if these methods were suited to the learning needs of the indigenous communities, it was necessary to find out how indigenous peoples learn within their communities, as there have been distinctions made between formal learning and indigenous learning systems. Formal learning systems have instructional design models that can be used when delivering the content of the subject matters to their learners; however, there is much to learn about an indigenised model that can be applied when reaching out to indigenous learners. The question to be asked was: would the community members react differently and be more involved in knowledge sharing or knowledge co-creation activities if the instructional design was an indigenised one instead of what was practised at the telecentre?

Gustafson and Branch (1997) believed that the fundamentals of the ADDIE model and other similar models were broadly applicable and accurate against claims made by other researchers stating that these models are not well-suited to current pedagogies. However, there is a growing body of literature recognising the need to better understand the function, impact, and implications of culture and globalisation on instructional design

(Damarin, 1998; Seufert, 2001; Willis, 2005; Heemskerk et al., 2005). Critique on the current instructional design has included researchers advocating for more culturally inclusive learning environments and instructional design, especially for indigenous learners, as it has been empirically reported that current practices do not fully take into consideration the needs of indigenous learners (Henderson, 2009; McLoughlin & Oliver, 2010; DeLorme, 2018), indicating that there is a growing trend and interest in the research pertaining towards culturally inclusive learning environments and methods. Aside from that, the role that culture has in the development of instructional design for indigenous learners is another aspect that must be considered, as was highlighted by Young (2009). Her work brought to attention that methods used for integrating culture in design were limited in scope, and that novel ways must be found to integrate culture in the design of ICTs and its engagement in the design process. Young's proposed Culture Based Model (CBM) attempted to fill the gap where a complete framework to align culture with the ADDIE model has not been available. Young considers 70 design factors that describe eight areas of CBM, all of which are intended to aid the instructional design process. While empirical work using Young's CBM is limited, it has been observed that the model is sound in theory (Richey, 2009), and therefore there is merit in using the model for further research work.

Considering that the bulk of the current literature on this topic has concentrated mainly in academic settings and online learning environments, and **research focusing on telecentre settings with indigenous communities has yet to be fully explored**, the present study aimed to investigate if the application of an indigenised instructional design in the learning activities offered at telecentres to indigenous communities in Sarawak would be useful in creating impactful learning experiences for them. The study intended to

use the motivation of the community members to share knowledge, co-create knowledge and participate in knowledge preservation as a way of measuring impactful learning experiences. The reason for this was because the community members at the current telecentre sites have stated that they were keen on sharing knowledge; however, this was not done at the telecentre when it was still operating. These observations were seen during the initial interviews with the community members from the first study site and further reported by community members from the other research sites, hence forming the questioning point for the researcher to find out the reasons why this knowledge sharing did not happen at the telecentre.

1.4 Research Objectives

The main objectives of the research were to explore if the current instructional design model used at the telecentre, which was based on the fundamental model of ADDIE, suited the learning needs of the indigenous communities involved, and to examine if the adoption of indigenous ways of learning and learning criteria into the instructional design of training modules rolled out at the telecentre would strengthen the motivation of the indigenous community members to engage in knowledge sharing and knowledge co-creation.

Specifically, the objectives of the study were:

i. To determine if elements of existing instructional design models implemented at the telecentres for indigenous communities contribute towards their knowledge sharing and knowledge co-creation practices;

ii. To propose and investigate how an indigenised instructional design could motivate knowledge sharing and knowledge co-creation among indigenous community members; and

iii. To describe the role of the telecentre in supporting learning and teaching, knowledge sharing, and knowledge co-creation activities among indigenous communities.

1.5 Research Questions

Based on the research motivation outlined in Section 1.2, the present study aimed at answering the following research questions:

i. To what extent does the current instructional design model used at the telecentre motivate knowledge sharing and knowledge co-creation among the community members?

ii. How can an indigenised instructional design used in learning programmes at the telecentre motivate knowledge sharing and knowledge co-creation among indigenous community members?

iii. How can the telecentre support the learning needs of indigenous communities, especially as a platform for teaching and learning, knowledge sharing, and knowledge co-creation activities among indigenous communities?

1.6 Significance of the Study

The study brings to attention important considerations that need to be taken when planning learning and teaching activities with indigenous communities, especially in terms of choice of instructional design to be used. As has been noted in the literature, there was a need to look at culturally inclusive instructional design, which could potentially be more

effective in strengthening motivation among indigenous users and retaining their interest, curiosity, and sense of achievement and competence in the activity. As researchers today are concerned with the alarming numbers of dropouts in school by indigenous students (Hardwood et al., 2012; Jain & Crisp, 2017), this study could possibly shed some insight on overcoming this problem through the use of an indigenised instructional design. While the study focused on informal learning environments, the findings of this study could still contribute to the body of research in this respect.

Apart from that, the use of an indigenised instructional design can aid when planning, designing, and implementing learning activities at telecentres for indigenous communities, as this serves as a guide for informing future project initiators intending to work together with indigenous communities on projects. By considering the usage of an indigenised instructional design, project initiators will be able to ensure that the projects meet the cultural needs and requirements of the indigenous communities, especially in terms of their key concerns, priorities, and interests, as well as to get community involvement, participation and use in the project. As reported by Whyte (1999) and Gomez et al. (1999), the success of the telecentre can be determined when there was community involvement. The link between the success of the telecentre and participation of the community was also reiterated by other researchers such as Roman and Colle (2002), Colle (2005), Rao (2008), Tanner and du Toit (2015) and Mishra and Unny R (2018).

The findings of this study could also contribute towards strengthening the interest and motivation of communities to be involved in such projects in the future.

1.7 Definition of Key Terms

i. **Indigenous communities**: "Inheritors and practitioners of unique cultures and ways of relating to people and the environment. They have retained social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they live" (UNITED NATIONS)

ii. **Telecentres**: "A physical space that provides public community-based access to ICTs for educational, personal, social and economic development" (Harris, 2001)

iii. **Instructional design**: "the theory and practice of design, development, utilisation, management, and evaluation of processes and resources for learning" (Reiser, 2018)

iv. **Culturally inclusive instructional design**: "instruction that accommodates diverse ethnic and cultural backgrounds among the learners expected to use it" (Reeves, 1997)

v. **Autonomy:** "A sense of initiative and ownership in one's actions. It is supported by experiences of interest and value and under- mined by experiences of being externally controlled, whether by re- wards or punishments" (Ryan & Deci, 2020)

vi. **Competence**: "The feeling of mastery, a sense that one can succeed and grow. The need for competence is best satisfied within well-structured environments that afford optimal challenges, positive feedback, and opportunities for growth" (Ryan & Deci, 2020)

vii. **Relatedness**: "A sense of belonging and connection. It is facilitated by conveyance of respect and caring" (Ryan& Deci, 2020)

viii. **Intrinsic motivation**: "Doing an activity for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000); "the inherent tendency to

seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (Ryan & Deci, 2000)

ix. **Knowledge sharing**: a process where "elders play an important role within the community and contribute in meaningful ways by sharing their knowledge of language, place and culture. The younger generations benefit from engaging with elders, hearing traditional stories, and learning their cultural practices" (Hausknecht et al., 2021)

x. **Knowledge co-creation**: "comes from a position of equality rather than dominance. It is seen as a way to tap into the collective intelligence of a group and a process of collective visioning and problem solving. As a method, co-creation focuses on civic engagement, shared decision-making, power sharing, intersectional collaboration, processes and relationships" (Ruhanen, Saito, & Axelsen, 2021)

1.8 Outline of the thesis

The thesis consisted of five chapters and was organised as follows:

Chapter One presented the background of the study, problem statement, research objectives, research questions, and the significance of the current research. The definition of key terms to the study, such as indigenous communities, culturally inclusive instructional design, and intrinsic motivation, was also discussed here and the research overview and structure of the thesis.

Chapter Two highlighted a comprehensive review of the literature according to the different areas leading towards the current investigation. Analysis of the areas of inquiry such as ICTs and the digital divide, telecentres, indigenous ways of learning, instructional

design, culture-based models as well as motivation was included in this section. Apart from that, the underlying theories of this study, identified gaps in the literature, and the research direction of the study were also discussed in this chapter.

Chapter Three discussed the methodology used in this study and highlighted the rationale for the study as well as the choice of methodology deployed in the study. The chapter also looked at the rationale for choosing the research sites, introduced the research site and its associated characteristics, followed by a detailed introduction to the selected research sites and the rollout of the telecentre projects at these sites. The different protocols used throughout the data collection phase with the indigenous community members was also addressed. Sampling of participants, research design, the trustworthiness of the study, and ethical considerations were also discussed here.

Chapter Four described the design and implementation of the training modules at the sites, followed by the analysis of the interviews with the trainers from the project team. Document data obtained from the project team were also presented in this chapter. Interview data obtained from respondents from all three telecentre sites, analysis of the data collected during the deployment of a community-led learning programme, which included data collected from the project team were also presented here. Interviews with and observations of the participants from the research sites were also discussed here. Conditions where motivation was more apparent among the community members and the participants were also reported in this chapter.

Chapter Five presented a discussion of the findings based on the previous chapter and sought to answer all the research questions guiding the present study before the conclusion of the research was presented. The discussion was organised according to the

research questions, which included a comparison between the ICT-literacy training and the community-led learning programme, followed by a proposed selection of requirements representative of an indigenised instructional design. Using the proposed selection of requirements against the learning programme conducted with the participants, it was found that the programme was an apt representation of a learning activity which used an indigenised instructional design. A discussion on using an indigenised instructional design to strengthen motivation was then presented, before the role of the telecentre in supporting the learning needs of indigenous communities, especially in fostering knowledge sharing and knowledge co-creation ensued. The chapter also reported the contributions and limitations of this study and addressed the implications for future research before the conclusion of this study.

1.9 Summary

The chapter presented an overview of the study, detailing the research motivation and highlighted the research objectives and research questions guiding the present study. The significance of the study was also explained here. A description of the key terms and overall structure of the thesis was also presented in this chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The objective of this study was to learn about the motivation to share knowledge and co-create knowledge among indigenous community members at the telecentre in Sarawak and if the motivation to participate in these activities could be strengthened through the usage of an indigenised instructional model. Analysis of the literature first looked at ICTs and the digital divide, the establishment of telecentres to overcome this digital gap, and the telecentre initiatives in Malaysia and Sarawak, followed by a discussion on the types of activities conducted at telecentres. Literature pertaining to community learning, communities of practice, indigenous ways of learning as well as research calling for the creation of more inclusive learning environments were studied. From this, a deeper inquiry into instructional design, as well as using culture-based models in creating a more inclusive and potentially indigenised instructional design, were discussed. Apart from that, as the study intended to look at levels of motivation, an inquiry was made into motivation and how to measure motivation among learners. Literature regarding knowledge sharing and knowledge co-creation was also explored in this review of the literature. Based on the literature review of the areas stated above, it was expected that a greater understanding of the current research would be obtained to direct the guiding questions and direction of the research.

2.2 Information and Communication Technologies

The emergence of information and communication technology (ICT) has become increasingly important worldwide, especially as information technology and the ability to use it is recognised as imperative towards generating wealth, power, and knowledge in our time (Castells, 1998 in Benjamin & Dahms, 1999; Avgerou, 2010; Walsham, 2017; Wang, Zhou, & Wang, 2021). Numerous studies have acknowledged that ICT has played a crucial role in social and economic advancements in recent years. It has been recognised that globalisation and technological change has created a new global economy fuelled by information and knowledge (Tinio, 2003; Chen & Qu, 2008).

The term ICT can be used to describe a "variety of goods, applications and services that can be used for creating, disseminating, processing and transforming information, such as T.V, radio broadcasting, hardware and software, computer services and electronic media" and could "accelerate and enhance the dissemination and sharing of information and facilities in the communication processes, across vast, geographically dispersed areas" (Marcelle, 2000; Chew et al., 2013). ICTs have been reported to be effective in reducing the knowledge gap, improving socio-economic conditions of societies, accelerating business and economic growth, boosting educational opportunities, increasing access to health and communication facilities, and enhance the accountability of governance (Chew et al., 2013). ITU Telecommunication Development Bureau Director Brahima Sanou stated in 2017 that "ICTs continue to be a key enabler of economic and social development, bridging the digital divide and fostering an inclusive digital economy".

Despite the increasing numbers of ICT users around the globe and the rising numbers of youths in Least Developing Countries (LDC) using the Internet, ITU reported

that the total number of users of the Internet in LDC post pandemic is 27% compared to 57% in developing countries and 90% in developed countries (ITU, 2021). The numbers show an upward growth compared to previous statistics which measured 17.5% in LDC compared to 41.3% in developing countries and 81% in developed countries (ITU, 2017), indicating that the digital divide still exists between communities who have access and those who do not. The digital divide, as observed by Benjamin and Dahms (1999, p. 50), can be described as:

> "Skills to use, and access to, ICTs (especially the Internet) offers great advantage to an individual to seek a good job, education, commercial products, and more. There increasingly is a division between those who have access to these systems and the information they contain (the 'information haves') and the many who do not (the 'information have-nots'). This has been referred to as the 'Digital Divide".

A similar view on the digital divide was also reported during the United Nations / Malaysia workshop on bridging the digital divide in 2000, where it was agreed that:

a) The term 'digital divide' dealt not only with lack of information but also lack of literacy and basic skills, local content, and community participation;
b) Development of human resources was one of the prerequisites to reduce the digital divide. Issues such as equitable access, equitable distribution of wealth, government participation, and monitoring of development should therefore be given high priority.

It was also recognised during the workshop that:

a) The gap in information technology between the haves and the haves-not was widening, especially between Europe and North America on the one side and Asia and the Pacific on the other;
b) The challenges posed by the digital divide, which included marginalisation of the population and uneven telephony services.

The United Nations/Malaysia workshop also noted that affordable access to ICT played a critical role in reducing the digital divide and that wireless access technology was necessary for isolated parts of some countries of the region. Access to ICTs allowed communities a way to share information, which was subsequently viewed as vital to development, as information was fundamental to the social and economic activities that comprise the development process (Harris, 2001; Islam & Hoq, 2010; Hanna, 2010). Considering that ICTs played a crucial role in the socio-economic development in developing countries, it was believed that the introduction of ICTs to the underserved communities would eventually lead to an improvement of their livelihood (Harris, 2001; Rao, 2004; Abdulwahab & Md Dahalin, 2021), as through the use of ICTs, access to information can be provided through the implementation of technologies and applications in ways that are relevant to the needs of the community.

It must be noted that in developing countries such as Malaysia, the challenge of ensuring that all groups of the population have equal access to ICTs remains. Despite the growth in providing access to technology and skills in navigating ICTs, digital transformations have yet to be fully achieved (World Bank, 2018; Sayed Umar et al., 2021). The effect of the digital divide was again brought to centre stage during the recent

COVID-19 pandemic, which saw the increased need for an online presence in order to support educational, governmental and industrial needs (Sayed Umar et al., 2021). As people transitioned towards working from home and depending primarily on online resources in their daily lives, emerging research began to reveal the effects faced by those disadvantaged by the digital divide (Hidalgo et al., 2020; Beaunoyer et al., 2020; Litchfield et al., 2021). These digital inequalities were perceived to put disparaged communities at a higher risk of both the pandemic as well as socio-economical consequences of the pandemic, calling for more attention to be given to further reduce this digital gap (Nations, 2021).

2.3 Telecentres

Access to these ICTs by underserved communities has been central in the research investigating the outreach of these ICTs towards users around the world, as the global technology boom brought to attention not only the advancements in technologies but also highlighted the vast difference between those who had access to this development and those who did not. Populations residing in rural and remote locations face difficulties in leveraging on the development of technology like their urban counterparts. Communities located in geographically remote and rural areas are significantly affected. These disparities are particularly evident because they do not have the necessary infrastructure and exposure to technology to benefit fully from these technological advancements (Chapman & Slaymaker, 2002; Heeks & Kanashiro, 2009; Sparks, 2013; (Philip et al., 2017).

The opportunity to have similar, if not equal, access to technology has been a subject of discussion for the past thirty years, as researchers seek to find ways to bridge

this gap between the communities. Oestmann and Dymond (2001) reported that "even in advanced economies, there are rural and remote communities that have been left behind in terms of educational and technological equity and access". There is also a growing call for developing countries to adopt the usage of ICTs as a potential means to increase access to and improve the relevance and quality of education (Tinio, 2003). As a result of this, various governments, agencies, and organisations worldwide sought to improve the living and socio-economic status of citizens through the implementation of various ICT programmes that have a strong emphasis on social and economic development (Brown & Grant, 2010; Walsham, 2012; Williams et al., 2016). Of the many initiatives, the most popular and widely deployed intervention has been telecentres, as these establishments are seen as solutions to development problems caused by the lack of access to ICTs. These community learning centre, telehouse, and telecentre initiatives were introduced to societies as a tool to bridge knowledge, social and economic gaps between the 'information rich' and 'information poor' (Gomez et al., 1999). Telecentre initiatives have also been globally embraced as a way of addressing digital divide issues through the provision of technology for the development of human capacity, learning of digital competencies and encouragement of social and economic development (Oestmann & Dymond, 2001; Etta & Parvyn-Wamahiu, 2003; Harris & Harris, 2011; Furuholt & Sæbø, 2017; Githinji, 2022). These community spaces are strategically located facilities providing public access to ICT-based services and applications and are generally equipped with "telecommunication services, office equipment such as computers, printers and photocopiers, multimedia hardware and software and meeting spaces for local business and community use" (Oestmann & Dymond, 2001; Githinji, 2022), and "physical spaces that provide public access to information and communication technologies, notably the Internet, for

educational, personal, social and economic development" (Reilly & Gómez, 2001). Telecentres also serve the communities by offering access to ICTs for educational, personal, social, and economic development (Harris, Kumar & Balaji, 2003; Kapondera & Namusanya, 2017; Githinji, 2022), and the general expectation of these telecentres is that they would support "educational and community development on both rich and poor countries" (Dhanarajan, 2001).

There are multiple models of ownership and management of telecentres, which include NGO-sponsored, local government handled, commercial or industry-run, school-based, and university-related (Oestmann & Dymond, 2001; Kapondera & Namusanya, 2017). Oestmann and Dymond (2001) also noted that "in developing countries, telecentre initiatives are most commonly financed and supported by external agencies, often in partnerships", such as:

- International and regional (development) organisations such as the International Telecommunications Union (ITU), United Nations Development Programme (UNDP), the World Bank, the Food and Agriculture Organization of the United Nations (FAO), and the Organization of American States (OAS);
- National international development agencies such as the Canadian International Development Research Centre (IDRC), Canadian International Development Agency (CIDA), USAID, the Danish International Development Agency (DANIDA), the Swedish International Development Agency (SIDA);
- Educational and cultural institutions such as UNESCO, The British Council, and the University of West Indies; and
- International and local NGOs

Testimonies on the success that these telecentres have had towards improving socio-economic status and providing the communities with increased educational opportunities have been reported worldwide. A farmer in China reported that he managed to improve his income after getting agricultural market information from the Internet, while another reported that she could learn about the latest technologies relating to silk worm production by using the Internet at the telecentre (Colle, 2005). Apart from that, another farmer utilised the services at the telecentre to obtain market prices for peanuts, highlighting that the telecentre is an important space of access to information and communication for people (Colle, 2005).

Oliver and Short (1996) posited that telecentres were integral towards increasing the level of awareness among rural communities about information and computing technologies, noting that the training programmes and support services provided in the telecentre network helped to raise peoples' knowledge of and expertise with computers. Internet training is a popular form of education at the telecentres as more learners and community members turn to the telecentres to pursue educational programmes. In fact, many telecentres offer educational services such as the provision of ICT literacy courses and e-learning opportunities (Chigona et al., 2017).

However, studies have stressed that ICT, the provision of ICT based services alone, is insufficient for telecentres to create social impact unless it also **addresses local contextual needs of the community** (Bala et al., 2000; Md. Dahalin et al., 2017; Githinji, 2022). These observations highlight one very salient feature that needs to be taken into consideration for telecentre initiatives to be successful; that these initiatives need to

correspond with the needs of the community that the telecentre serves, which is an angle that the current study focuses on.

2.4 Telecentre Initiatives in Malaysia

Like in many other countries, both developing and developed, Malaysia's digital / ICT infrastructure development has been concentrated primarily in its cities and towns (Mohd Noor & Kassim, 2007). Digital infrastructure distribution on a geographical basis has largely reflected regional inferences in economic development and population density, with the predominantly rural states of Sabah and Sarawak falling far short of the national average. The report further highlights a disparity between the digital / information-rich and the digital/information poor among various groups in Malaysia (Mohd Noor & Kassim, 2007).

In recognition of this, the Malaysian government established the National IT Agenda (NITA) under the Third Outline Perspective Plan (2001-2010) and the Multimedia Super Corridor (MSC) under the Eighth Malaysia Plan (2001-2005) to boost the development of the global ICT industry (Chew et al., 2013). Aside from that, several steps were also put in place by the Malaysian government and private sectors to enhance digital literacy in these areas, such as creating awareness among the rural population and providing the infrastructure to the rural areas (Mohd Noor & Kassim, 2007). Initiatives to bridge the digital divide in underserved areas by offering basic Internet access and ICT training to the members of these communities in Malaysia are evidenced by the establishment of Medan Info Desa, Pusat Internet Desa, Community Broadband Centres, and the Pusat Internet 1Malaysia. These establishments are examples of the first few

attempts made by the government at increasing the ICT penetration rates to its people, thus narrowing down the digital gap.

Another project implemented by Malaysia is the *Pusat Internet 1Malaysia (PI1M)* (now known as the *Pusat Internet (PI)*), which is a government initiative spearheaded by the Malaysian Communications and Multimedia Commission (MCMC) in an effort to bridge the digital divide in underserved areas by offering basic Internet access and ICT training to the members of these communities (http://usp.skmm.gov.my/FAQs/Pusat-Internet-1Malaysia- (PI1M).aspx). Through this initiative, users of the Pusat Internet are able to utilise high-speed broadband connectivity as well as Wi-Fi facilities provided under the 1Malaysia Wireless Village project. Each Pusat Internet comes equipped with 20 computer terminals with pre-loaded basic ICT applications and can also enjoy other services such as faxing and printing. All courses organised at the Pusat Internet are administered and conducted by the manager and assistant manager of the respective Pusat Internet. Efforts have also been extended to reach communities that are placed in remote rural locations, such as the highlands of Sarawak, whereby telecentres were established in the Kelabit Highlands of Bario (eBario), the Lun Bawang village in Ba'Kelalan (eBa'Kelalan), and the Penan settlement in Long Lamai (eLamai) (CoERI, 2010).

Table 2.1: Hipotesis Kajian

No	Type of telecentre	No of telecentres (as of 2011)	Objectives	Target group	Management structure
1	Pusat Internet Desa by Ministry of Energy, Water and Communication (2000)	42	To bridge the digital divide between rural and urban communities through shared facilities with computers and internet access. Provide classes and seminars	Women Senior citizens Youth Students Entrepreneurs Government and private sector employees Small and medium businesses Individuals (local community members)	Post office (annexe.) Supervised by a manager and assistant

Table 2.1 Continued

2	Medan Info Desa by Ministry of Rural and Regional Development (2011)	236	To create a knowledgeable society by 2020. To provide equal opportunities to all communities with respect to ICT. To attain a knowledge-based economy,	Small businesses Schools Youth Disabled people Farmers Women's groups Political parties Government departments	Management Board (chaired by a District Officer), consisting of members of the community. A manager and four trainers.
3	Community Broadband Centre by Malaysian Communications and Multimedia Commission (MCMC) (2010)	246	Provide ICT services to the community in rural areas, e.g. WIFI access, training programmes, IT-related events. Bridge digital divide and prime society for the information age	Children Women Adults Entrepreneurs Senior citizens	Supervised by a manager and assistant manager

However, Chew et al. (2013) observed that despite the aggressive rolling out of these telecentres across the nation, few studies identifying the critical issues affecting the development of ICT projects in the rural communities had been conducted. Some of the issues that were identified by Chew et al. include:

- Quality and availability and maintenance of infrastructure;
- Community involvement;
- Ability to meet local needs and interests;
- Numbers of staff needed to handle tasks and responsibilities;
- Seminar and courses provided; and
- Partnerships with other entities

The issues identified by Chew et al. (2013) are important as they could potentially be used as indicators when discussing the efficacy of training programmes rolled out at telecentres, especially when looking at the motivation of community members to undergo the training and to potentially partake in knowledge sharing and knowledge co-creation activities after participating in the training. The issues that could be used for this purpose include (i) community involvement, (ii) ability to meet local needs and interests, and (iii) seminar and courses provided. These issues are of particular importance especially when considering the role of the community towards their own teaching and learning process, as well as community priorities, as the ability to meet with local needs and interests are crucial in order to allow for meaningful learning for the community members.

2.5 Telecentres as Learning Spaces

Telecentres have been used as a learning space for the users of the telecentres, as can be seen through the numerous learning activities that have been organised at the telecentre. Oliver and Short (1996) also reported that telecentres have increased the level of awareness among rural communities of information and computing technologies and the training programs and support services have helped to raise peoples' knowledge of, and expertise with, computers and have become a focus of many of the educational programs sought by the students and delivered through the telecentres. It was observed that telecentres were often used as places to "interact and share ideas on various issues important to their lives" (Kapondera & Namusanya, 2016, p. 2), reiterating the observations made by Chikumba (2010) and Buhigiro (2012). ICTs were also capable of providing "diverse options for taking in and processing information, making sense of ideas, and expressing learning" and that extra support can be given to students with special needs and different learning styles as these platforms would have features such as "simplified screens and instructions, consistent placement of menus and control features, graphics combined with text, audio feedback, ability to set pace and level of difficulty, appropriate and unambiguous feedback, and easy error correction" (Information and Communications Technology (ICT) in Education, n.d., n.p).

Oliver and Short (1996) also observed that students were very appreciative of the innovative and interactive programmes provided at these telecentres, such as the talkback television, audio conferencing and computer networks. Feedback collected from the students was generally positive and included them stating that they found the programme appealing and effective. They also reported that communication through email provided another effective dimension for teaching and learning through telecentres. While these

links are used primarily for informal communication, there is the prospect of the future of these technologies becoming integral components of lesson design, enabling collaborative and cooperative activities between the remote students as part of their coursework.

It has also been recognised that as the world moves towards becoming information and knowledge-based societies, the establishment of community learning centres has been seen to be able to meet with the learning needs by "providing a variety of learning opportunities that can empower people within a community and improve their quality of life" (UNESCO, 2016, n.p).

In recognition of the importance of non-formal, lifelong learning and development of skills, UNESCO (2016, n.p.) also observed that the future of these centres is:

> "likely to place an even greater emphasis on learning and skills development. The dramatic growth of information on the internet will continue. Furthermore, the information content will be more sophisticated and interactive. The development of e-government and e-commerce could have a profound impact on the lives of people in remote communities. Digital technology will become not just more sophisticated, but cheaper and easier to use. People and communities will want to use the technology for more than just accessing information from the internet. The question is: Will they do so collectively through the development of community centres?"

Based on the observation by UNESCO (2016), it can be deduced that communities today want to do more than becoming mere recipients of information; but instead, there is a

possibility that they would like to become contributors to the body of knowledge available online. Considering this possibility, one question that the current study attempts to answer is if telecentres are an ideal location for users to participate in knowledge sharing and knowledge co-creation activities.

2.5.1 Learning Activities at Telecentres

Telecentres have been recognised to be capable of providing useful services in education and could potentially act as a centre to provide people with information literacy skills to develop the economy (Benjamin & Dahms, 1999). Latchem (2001) stated that telecentres are also capable of providing support for distance education and could provide the following services according to the local needs and circumstances:

- Non-formal adult and community education
- Counselling, enrolment, tutoring, library support, study support and examination supervision for formal accredited study
- In-service training for professionals and para-professionals, public sector employees, business and industry
- ICT training aimed at generating employment and business enterprise
- Government and community information and online news services
- Online discussion and working groups

Some telecentres have also built formal networks with schools, universities, and other training providers, such as the WREN telecottage in Warwickshire, United Kingdom (Evans, 2001). Apart from that, telecentres can also provide offline training programmes for the community to increase their skills and knowledge. An example of such training is

the ICT literacy training conducted at telecentres to familiarise local communities with using ICTs and the internet (Juan et al, 2010). To date, most active telecentres report that the learning activities conducted consist mainly of ICT training, training modules as well as academic-based activities (Yasya, 2020).

2.5.1.1 e-Learning at Telecentres

The usage of ICTs has also enabled learners in rural locations to gain access to education via e-Learning. Hussain et al., (2013) also observed that online learning activities facilitated more effective education and offered significant benefits over traditional methods. They also reported that the proper planning, design, and implementation of online learning activities could lead to the effective learning and contribution of ICTs to student performance and that online learning activities facilitate more effective education and offered significant benefits over traditional methods (Hussain et al., 2013). The same study also revealed that using ICTs in education improved students' attitudes toward learning, the development of teachers' technology skills, and increased the community's access to education and literacy.

Anand et al. (2012) reported that several critical factors for the successful provision of e-Learning in rural areas were identified, namely the development of suitable learning content that suits the needs of learners, fast Internet, marketing, keeping ahead with new technologies so that the delivery does not become obsolete, training of staff that design and deliver e-learning and the willingness to learn and self-discipline of learners. The study also reported several challenges when delivering e-Learning in rural areas, such as lack of suitable infrastructure for fast Internet connectivity, IT illiteracy, limited financial capacity of rural residents, and lack of support staff in rural areas. However, it was also reported

that 95% of the participants in an e-Learning programme indicated that they were keen on participating in future e-Learning programmes in the future. Challenges in terms of ICT readiness was also observed in rural communities in Sarawak, with the elder generations shying away from using ICTs due to technology phobia and literacy (Sulaiman & Halamy, 2021), indicating that there is a need to look at alternative ways for indigenous community elders and members to overcome their fear towards using technology at the telecentres and ways of assessing their progress which would not rely solely on literacy skills.

2.5.1.2 MOOCs and CL-MOOCs

Apart from that, programmes such as Massive Open Online Courses (MOOCs) can also be organised at the telecentre, as these platforms offer a wide variety of courses, ranging from up-skilling courses to more traditional online degree programmes to a large pool of students (Zhu et al., 2020; Blum-Smith et al., 2021). Over the years, MOOCs have evolved from being a platform that catered to the learning needs of learners with a specific background to one that is better suited to the needs of developing countries, such as more context-sensitive, geo-located and crowd learning (Pariyar et al., 2020). Such specifications are also relevant for rural communities, which have their own challenges and unique contexts that should not be overlooked. It has been observed that the traditional delivery of MOOCs takes on a pre-dominantly one-way knowledge flow, whereby the courses from "established universities in the global north are integrated into the curriculum of developing countries", which in turn hampers the ability of rural communities to contribute their local knowledge (Pariyar et al., 2020).

In consideration of this, the Community-Led Massive Open Online Course (CL-MOOCs) project was initiated as a response to the existing MOOC model, which was seen

to be inhibitive in providing support to the learning context and ways of life of underserved communities, which include indigenous communities. As highlighted in Figure 2.1, the CL-MOOC approach changes the "role of the MOOC platform to allow users to create their own learning modules and becomes recognised for contributing knowledge, thoughts and ideas" (Kulathuramaiyer et al., 2020). Through the proposed CL-MOOCs design model, the delivery of MOOCs that supports the inclusion of the challenges and contexts of rural communities was made possible.

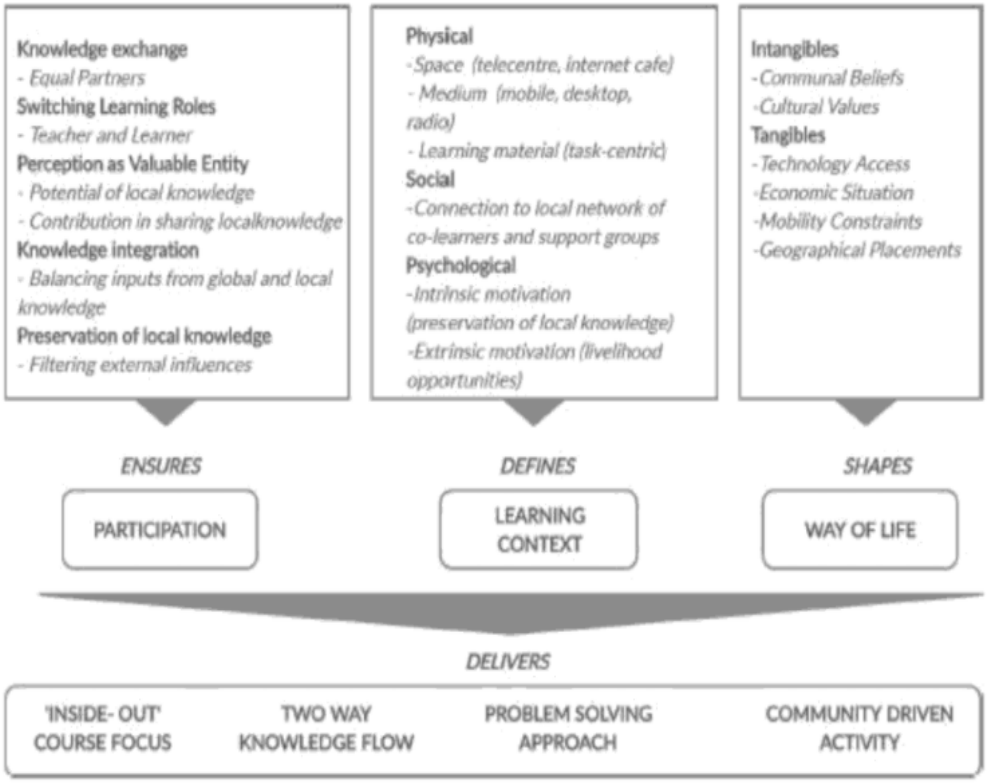

Figure 2.1: Kelompok Definisi Resilien

2.5.2 Evaluation of Learning at the Telecentre

Oliver and Short's (1996) research with the Western Australian Telecentres Network showed that the students and instructors were very receptive towards interactive

technologies and communication through email gave an added effective dimension for teaching and learning through telecentres and that although these links are used mainly for informal communication, there is the possibility in the future of these technologies becoming essential components of lesson design allowing collaborative and cooperative activities between the remote students as part of their coursework (Oliver & Short, 1996). Learning at the telecentres has been reviewed by researchers, both internationally and on a national scale; however, the bulk of the research has mainly discussed distance and online learning. Other evaluations of the telecentre have concentrated on:

Table 2.2: Telecentre evaluation themes (compiled by author)

Evaluation themes	**Literature**
User acceptance and readiness	Abdul Razak & Abdul Malek, 2008
Effectiveness • Facilities / Infrastructure • No of users	Amariles, Paz, Russell & Johnson, 2006; Hassan & Megat Tajuddin, 2010; Ibrahim, Sulaiman & Faziharudean, 2011
Human development	Cecchini & Raina, 2004; Mathur & Ambani, 2005; Ibrahim, Abdul Malek, Salman, 2015
Sustainability	Ernberg, 1998; Harris, 2001; Hudson, 2001; Hassan & Megat Tajuddin, 2010; Abdul Malek, Ahmad, Awang, Alfitri, 2014
Management	McConnell, 2001; Hanna, 2010; Ibrahim, Yasin, & Md Dahalin, 2010; Chew, Abu Samah, & Omar, 2013
Financial	McConnell, 2001; Abdul Razak & Abdul Malek, 2008; Ibrahim, Yasin, & Md Dahalin, 2010
Needs assessment	McConnell, 2001; Roman & Blattman, 2001; Cecchini & Raina, 2004; Hanna, 2010; Lin, Kuo, Myers, 2015
Telecentre performance & Impact assessment	Gomez & Hunt, 1999; Whyte, 1999; Earl & Carden, 1999; Wakelin & Shadrach, 2001; Amariles, Paz, Russell & Johnson, 2006; Ibrahim, Abdul Malek, Salman, 2015

Table 2.2 Continued

Evaluation planning and guidelines	San Sabastian, 1999; Contreras-Budge, 1999; Scharffenberger, 1999; Hudson, 1999; Whyte, 2000
Gender analysis	Holmes, 1999

The review of existing literature highlighted several themes of evaluation regarding the telecentre and the activities conducted at the telecentres. As observed, telecentre evaluations have largely concentrated on telecentre management, facilities and services offered at the telecentres, as well as the impact that the telecentre has had on the communities served, especially in terms of economic and human development. Literature on the planning and guidelines towards establishing a telecentre were also limited to what was reported primarily during the earlier years of telecentre establishment. Recent literature showed extensive work studying sustainability of telecentres, and five factors affecting sustainability have also been identified, namely financial and economic factors, **cultural and social factors**, technological factors, political and institutional factors and lastly, environmental factors (Thai et al., 2022). Although there were various success stories on the usage of ICTs in learning, it was reported in the study by InfoDev that although it is generally believed that ICTs were capable of empowering teachers and learners, promoting change, and fostering the development of 21st-century skills, there was still limited data supporting these beliefs.

The observation made by Thai et al. (2022) on cultural sustainability highlighted the importance of the "contributions and support to telecentres from local inhabitants and vice versa", which indicated that when community members are part of the telecentre operations and if they were involved in the design and development of the learning

activities conducted at the telecentre, this could potentially increase sustainability of the telecentre as well. In this respect, this brought to attention another area of evaluation that has not received as much empirical attention, which was the instructional design used at the telecentre when implementing learning activities for the communities, especially indigenous communities. Particularly, culturally inclusive instructional design and the potential of using this to encourage knowledge sharing and knowledge co-creation among indigenous community members have yet to be fully addressed empirically, indicating a gap in the literature regarding this aspect.

2.6 Learning Approach at Telecentres

As it has been established that telecentres often function as learning spaces, it was then pertinent to investigate how these learning activities are conducted at the telecentre. A study conducted by Juan et al. (2010) reported that the training conducted at the telecentre used the Analysis, Design, Development, Implementation, Evaluation (ADDIE) model of instructional design and was structured in a formal learning setting, with a trainer explaining the content of the course and the participants taking on a learner role. The subsequent telecentre replications at the research sites also followed the initial modules and training design developed for the eBario telecentre. However, as the participants of the training consisted primarily of indigenous community members, the question that arose was if this was well suited to the learning needs of the participants, as there is a distinct difference between formal learning and the ways that indigenous communities learn.

In order to fully understand the potential of using an indigenised instructional model to encourage knowledge sharing and knowledge co-creation among indigenous community members, it was essential to first understand how the community learns and

how learning activities have been conducted at the telecentre. The reason for this was so that a deeper understanding of whether these existing methods are suitable for indigenous communities and if these methods are representative of how indigenous communities learn. As was reported in the Open Learning Exchange (OLE) project in Nepal, there was a fundamental change in the pedagogical approach to primary education brought about by using ICTs and that the main change was the move from being teacher-centric towards becoming pupil-centric education. Teachers had commented that the students knew more than them now, and students had also become more creative by using laptops in areas other than schoolwork, as was demonstrated by a student who had used the laptop to compose music (Thapa & Sein, 2014). The above observation highlights then when a learning activity is geared towards the learner rather than the instructor, there can be changes in the learner's experiences, and this could potentially motivate the learner to partake in knowledge sharing and co-creation activities.

Having a learner-centric approach towards training and learning activities also fits in with the way indigenous communities learn. However, as the study investigated learning activities conducted at the telecentre and later with the communities residing at the telecentre research sites, literature on non-indigenous paradigms of learning, together with indigenous learning, was also examined.

2.7 Types of Learning

In order to understand this difference, a review was conducted to examine the different forms of learning. Generally, learning can be distinguished into three different types, which are formal learning, non-formal learning, and informal learning.

Table 2.3: Differences between Formal, Non-formal, and Informal Learning (Source: Eshach, 2007)

Formal	Non-formal	Informal
Usually at school	At institution out of school	Everywhere
May be repressive	Usually supportive	Supportive
Structured	Structured	Unstructured
Usually prearranged	Usually prearranged	Spontaneous
Motivation is typically more extrinsic	Motivation may be extrinsic but it is typically more intrinsic	Motivation is mainly intrinsic
Compulsory	Usually voluntary	Voluntary
Teacher-led	May be guide or teacher-led	Usually learner-led
Learning is evaluated	Learning is usually not evaluated	Learning is not evaluated
Sequential	Typically non-sequential	Non-sequential

Malcolm et al. (2003) noted that not all learning experiences are the same in all situations. When examining particular learning situations, it is pertinent to have ways of analysing the attributes of formality or informality. Malcolm et al. go on to identify several features to differentiate formal, non-formal, and informal learning, namely:

Table 2.4: Interrelationships between formal, non-formal, and informal learning (Adapted from Malcom et al., 2003)

Aspects	**Attributes**
Process	Formal: • Engagement in tasks structured by a teacher • More didactic, teacher-controlled pedagogic approaches • Summative assessment • Led by teacher

Table 2.4 Continued

Process	Informal: • Learning processes are incidental to everyday activity • Democratic, negotiated or student-led practices • Predominantly formative and negotiated assessment (relatively informal); none (informal) Led by industrial trainer, trained mentor or guidance counsellor (less formal); friend or work colleague (informal)
Location and setting	Formal: • Situated at the school or college • Close-ended, time restrictions, specified curriculum, predetermined learning objectives, external certification Informal: • Situated at the workplace, local community or family • Open-ended, few time restrictions, no specified curriculum, no predetermined learning objectives, no external certification

According to the available literature on these three forms of learning, it was surmised that learning experiences at the telecentres would fall under non-formal or informal learning.

2.7.1 Community Learning

Often perceived to mean the learning of individuals within a community, community learning can also be defined as an instance when everyone perceives themselves as having contributed to a group outcome, and all members of the group can individually describe what the group as a system knows (Kasl & Marsick, 1997). Other

definitions for community learning include a specific community where learning is ongoing and changing (Brooks & Moore, 1997), learning in a collective, whereby the learners are members of an epistemic community such as working groups, organisations or industries (Lawson, 2000). One of the questions often asked in the literature is how to better understand the way participants learn in the communities (Hairon, Goh, Siew, & Wang, 2015), as well as how "mentors' mediating actions operate to promote particular kinds of learning environments for student teachers (Rachamim & Orland-Borak, 2018). Recent years have seen a surge in the literature examining community learning in schools with an emphasis on collaboration, continuous learning, broadening learning networks and shared leadership (Kools & Stoll, 2016; OECD, 2020; (Tarnanen et al., 2021).

For the purpose of this study, community learning was defined according to the definition provided for by Brooks and Moore (1997), as the focus of the study looked at how the community members contribute collectively towards their teaching and learning process, and how this process can evolve to meet with changing needs and priorities.

2.7.2 Communities of Practice

On the other hand, communities of practice describe people who engage in a process of collective learning, whereby learning is construed as a social process that is situated in a cultural and historical context rather than as an individual effort (Wenger, n.d.; Farnsworth et al., 2016). It was also posited that learning occurs through our participation in multiple social practices, practices which are formed through pursuing any kind of enterprise over time (Farnsworth et al., 2016). Wenger also posited that not all communities are communities of practice, and that communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it

better through regular interaction. There are several characteristics of communities of practice, namely that they are formed through the social interaction of members with one another using formal, informal or technological settings, involve the sharing of relevant information between each member, includes collaboration between the members to either solve problems or create new knowledge, and fosters development of a shared-identity among its members (Li, et al., 2009; Jørgensen & Hadders, 2015). These characteristics are similar to indigenous ways of learning, considering that indigenous communities also learn through social settings and often share information that is relevant to them as individuals and as members of the community as a whole, therefore the present study relied on this definition to describe communities of practice.

2.7.3 Indigenous Ways of Learning

Indigenous communities around the world have ways of learning that are distinct to their own cultures. Traditional knowledge is passed down between generations through stories, songs, dances, performances, and the arts (UN, 2019). The learning process for many indigenous cultures happens through the process of "observing and doing, and interacting over long periods with knowledgeable elders and the natural environment" (Bates et al., 2009, p. 6). It was also noted that this learning process is "so subtle and unobtrusive that often it is not recognised as learning at all, even by the learners themselves" and that "the knowledge resulting from this latter process is not necessarily abstract information, but is instead intricately bound to experiential process" (Bates et al., 2009, p. 6). Learning through inclusion and through using hands-on experiences is placed as a priority in the learning process among indigenous community members. One of the main features of indigenous learning is that it is a process that involves all members of the community, and knowledge is shared through observation, imitation, narratives,

collaboration, and cooperation. Skills are learnt through interactive exchanges between community members and often in informal settings. Indigenous communities have been reported to create educational environments that are closer to their ways of life and upbringing, rather than in a structured environment that is prevalent in Western methods of education (Te Kīpa Kēpa et al., 2021).

Indigenous learning has been widely discussed in the literature, especially when looking at bridging formal education together with indigenous ways of learning. There are numerous studies and in-depth studies on the learning practices of indigenous communities worldwide, whereby studies have been conducted on how to best align indigenous learning practices with the educational practices in schools and institutions. Much of the studies undertaken have observed the challenges of this, with Chavajay and Rogoff (2002) noting that it has been hinted that indigenous American ways of learning in the family and community are qualitatively different from the ways learning occurs in traditional Western learning environments, emphasising cooperation and mutual responsibility in groups rather than adult direction and assignment of discrete roles and responsibilities to children and that indigenous people have often denoted their experiences as living in two different worlds, continually negotiating European school and indigenous ways of life. Article 14 of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) states that indigenous peoples have the right to establish and control their educational systems and institutions, providing education in their own languages in a manner appropriate to their cultural methods of teaching and learning. The necessity for the inclusion of cultural methods of learning when rolling out learning programmes is highlighted here, as is the case in telecentres.

Similarly, Chino and DeBruyn (2006) also observed that for many tribal communities, the conceptualisation and implementation of capacity-building strategies are themselves disparate in that they are based on imported Western frameworks rather than on indigenous epistemologies and indigenous "ways of knowing".

There are certain patterns of similarity with regards to how indigenous communities learn based on the existing literature, which is tabled below:

Table 2.5: Indigenous ways of learning (compiled by author)

	American Indian	Canadian First People	Alaskan Natives	New Zealand Maori	Malaysian Orang Asli	Sarawak Kelabit
Observation	√	√	√	√	√	√
Imitation					√	√
Narratives/ storytelling		√	√	√	√	√
Collaboration		√		√	√	√
Apprenticeship	√				√	√
Community involvement	√			√	√	√
Music and dance				√		√

2.7.4 Comparison between Indigenous and Non-indigenous Ways of Learning

Indigenous knowledge is different from non-indigenous knowledge, or 'scientific knowledge' that most of us are familiar with. The table below identified some differences between education systems based on indigenous and non-indigenous knowledge. While it may not be feasible to totally reorient formal education to an indigenous system, however, there could be some lessons that can be learnt.

Table 2.6: Comparison between Indigenous and Formal Education (Source: UNESCO, 2010)

Aspects of Education	**Indigenous Education**	**Formal Education**
View of Knowledge	• Sacred and secular together; includes the spiritual • Holistic and integrated – based on a whole systems view of knowledge • Stored orally and in cultural practices • Powerful predictability in local areas (ecological validity) • Less valued in distant areas	• Secular only; often excludes the spiritual • Analytical or reductionist – based on sub-sets of the whole • Stored in books and computers • Powerful predictability in natural principles (rational validity) • Weak in local use of knowledge
Objectives	• Long-term wisdom • Cultural and ecological sustainability • Practical; for use in everyday life • Integration of critical thinking and cultural values in decision making	• Short term recall • Economic sustainability • Abstract; to pass examinations • Use of logical and critical thinking in making decisions
Methods of Teaching and Learning	• Lengthy period of acquisition • Learning through experience • Teaching through example, modelling, ritual and storytelling • Tested in practical life situations	• Rapid acquisition • Learning by formal education • Teaching through abstract concepts and didactic methods • Tested artificially in examinations

2.8 Instructional Design

Instructional design is a curriculum-focused approach, which is usually developed by a central group or core tutor. Instructional design can be defined as a systematic methodology to design and develop materials and content to aid in the acquisition of new knowledge and skills. The greatest goal of the instructional design is to assist in the

learning needs and learners' achievement through adequate and appropriate facilitation of content and encouragement interaction. Gustafson and Branch (2002) also noted that the processes within instructional design can lead to a clear tactic that is more proficient, efficient, and pertinent to instruction. Although there are many other definitions of instructional design, most viewpoints and components are alike. While there are many different instructional design models available, they all include similar essential phases of instructional design: analysis, design, development, implementation, and evaluation phases.

2.8.1 Instructional Design Models

Many instructors today rely on learning theories and instructional design models to ensure effective instruction, as learning theories provide the basis for the selection of instructional strategies and allow for consistent prediction of their efficiency (Khalil & Elkhider, 2016). Learning theories also give instructional designers lucidity, direction and focus throughout the instructional design process (McLeod, 2003)'. In the words of Merrill (2001), a theoretical tool, in and of itself, is not an instructional design theory but defines instructional workings that can be used to explain instructional recommendations more accurately. Learning theories help instructional designers comprehend how people hold and remember information and stay driven and engrossed in learning. The main theories that have been linked to instructional design include behaviourism, cognitivism, constructivism, and connectivism.

Table 2.7: Learning theories

Learning theory	**Key aspects of the instructional design process**
Behaviourism	Task analysis Example: identifying observable behaviours or steps learners need to take to achieve the desired learning outcome designer observes learners from various expertise levels completing the ask to create a thorough task analysis to inform the design of instruction Criticised because of emphasis on external behaviours only
Cognitivism	Usage of taxonomies of learning outcomes that specify what mental processes are relied upon for various types of learning Example: Bloom's Taxonomy, later revised Brought about the shift from learning theory to instructional theory – focused on the design of instruction rather than how learners process information or learners' behaviour.
Constructivism	Cognitive constructivism • Individual personal experiences • Probing questions to help learners identify problems, reflect on knowledge, misconceptions, and progress Example: anchored instruction – incorporates instructional technology such as video Social constructivism • Social interaction – exchange of ideas to aid construction of new knowledge Example: group activities – projects, experimentation, discussions. Learners engage with content and then decompress with one another to develop or construct meaning from various activities – teachers as facilitators to scaffold learning
Connectivism	Learners make connections between ideas located throughout personal learning networks

As learning theories help to frame variables that are crucial in finding solutions, therefore understanding theoretical frameworks and suitably including them within the

scope of instructional design is imperative for designers to efficiently prepare and present instruction (McLeod, 2003).

Instructional design (ID) models translate general principles of learning and instruction in order to provide a procedural framework to educators and instructors. With the use of this framework, suitable instructional materials and conducive learning environments can be created to achieve successful learning outcomes (Khalil & Elkhider, 2016). While there are many different types of instructional design models, it was emphasised by Mutlu (2016) that most of the existing instructional design practice are typically based on the generic ADDIE model, which comprises of five stages, namely: Analysis, Design, Development, Implementation and Evaluation. According to Molenda (2003), the ADDIE model seemed to exist more as a label than as a definite ID model, and the ADDIE model was an idiomatic term used to define a systematic method to instructional development. The ADDIE model was also described as an overarching term that indicates a family of models that share a common underlying structure. (Molenda, 2003). Other popular instructional design models include the Dick & Carey ID Model, Kemp ID Model, and Gagne's Nine Events of Instruction ID Model (Mutlu, 2016). A summary of selected ID models are tabled below in Table 2.8:

Table 2.8: Instructional design models (compiled by author)

Description	Instructional Design Model			
	ADDIE	**Dick and Carey**	**Kemp**	**Gagne's Nine Events of Instruction**
Attributes	Considered to be the 'mainframe' of instructional models Process represents a dynamic, flexible guideline for building effective training and performance support tools	Follows more of a behaviourist approach Champions a systems view of instruction as opposed to viewing instruction as a sum of isolated parts Components are executed iteratively and in parallel rather than linearly Instruction from instructor's perspective	A holistic, systemic, flexible, and non-linear (cyclic) model emphasising on the adoption of continuous implementation and evaluation throughout the instructional design process Designers can start from any phase and skip phases as needed Emphasis on learners over content during instruction	Based on the behaviourist approach to learning Addresses conditions of learning -the idea that different things are best

Table 2.8 Continued

Phases	1. Analysis 2. Design 3. Development 4. Implementation 5. Evaluation	1. Identify instructional goals 2. Conduct instructional analysis 3. Analyse learners and contexts 4. Write performance objectives 5. Develop assessment instruments 6. Develop instructional strategy 7. Develop and select instructional materials	1. Instructional problems 2. Learner characteristics 3. Task analysis 4. Instructional objectives 5. Content sequencing 6. Instructional strategies 7. Designing the message 8. Instructional delivery 9. Evaluation instruments	1. Gain attention 2. Inform students of objectives 3. Stimulate recall of prior learning 4. Present the content 5. Provide learner guidance 6. Elicit performance 7. Provide feedback 8. Assess performance
Usage	Widely used across the training industries	Can be used to design individual learning as well as design instruction of groups Instruction can be instructor-led or self-directed	Can be used in a range of settings, industries, businesses, higher education, medical, military, and government	Widely used across the training industries
Critiques	Linear nature of the model may make it restrictive Too detailed in process and planning, difficult to be creative Comprehensive analysis in the early stages is time consuming	Process can be rigid and cumbersome in real-life ID situations	Slow paced, lacks creativity, less attractive to modern learners	Steps require a lot of guided assistance when teaching new skills – could lead to learners that are very dependent on guided information

2.9 Instructional Design and Culture

When faced with the question of whether existing instructional models that are based on the fundamental model of ADDIE are flexible and descriptive enough to provide cultural guidance for instructors, researchers such as Gustafson and Branch (1997) would argue that they are. These authors defended ADDIE and other instructional design models as being broadly applicable and accurate against claims made by other researchers stating that these models are not well-suited to current pedagogies. While the authors recognised developments in instructional development models, they maintained that these models do not depart from earlier models, stating that although they had no argument with those who were exploring different ways of developing learning environments, they believed many claims for uniqueness were overstated.

What had to be noted here was that in a later study conducted by Visscher-Voerman and Gustafson (2004), it was found that activities in the instructional design process do deviate from the activities and order proposed in the ADDIE model and were more diverse and heterogeneous. McLeod (2003) postulated that instructional designers also need to consider the learners' needs and characteristics, content and context, the strengths and weaknesses of the learning theory considering the scope of instruction as well as the designer's own intentions, preferences, and expectations. The more recent studies indicated that there is a growth in the existing views of instructional design, as more complex characterisation of the instructional design process is being embraced (Parrish & Linder-vanBerschot, 2010; Russell et al., 2013; Ipek & Ziatdinov, 2017).

However, despite the indication of such growth, it was observed that the majority of instructional design practice was still dominated by conventional instructional design

models, and although culture-focused research is budding in the instructional design discipline, these proposed models were often either untested, tested only by their creators, and tend to prescribe instead of describing instructional design processes (Henderson 1996; Richey, 2009; Young, 2009; Russell et al., 2013). Recent years have shown developments in the field of instructional design, with contemporary models such as the Integral ASIE ID Model, the Backward Design Model, and the Four Component Instructional Design Model (4C/ID) (Md. Zain, Muniandy, & Hashim, 2016; Wiggins & McTighe, 2016; Frerejean, et al., 2019), however, these models appear to lack specific considerations towards culture and indigenous ways of learning in its constructs.

Looking at how the future of the telecentre is positioned as a learning centre, it was important to then look at the current practices at the telecentres when planning and implementing learning activities and explore the implementation of an indigenised instructional design for the use of indigenous communities at telecentres, which was the focus of this study.

2.9.1 Culturally Inclusive Instructional Design

Recent literature has highlighted a growing interest in creating culturally inclusive learning environments. Gronseth et al. (2020) noted that it was important for designers to recognise that there will likely be a great diversity of learning preferences, abilities, and experiences that learners will bring to a course or other learning experience. Brinck (2005) opined that learners will experience obstacles to their learning when learner variability is not addressed in the instructional design and that this would limit the effectiveness of their learning experience (Gronseth et al., 2020). These observations highlighted the need for learning instruction to be inclusive for all learners, especially indigenous learners, who

have varied learning needs. This was also reiterated by researchers such as McLoughlin and Oliver (2001), who have advocated for a cultural dimension in the design process, and the need to provide culturally sensitive learning environments. They observed that a limitation in current instructional design models was that they do not fully contextualise the learning experience and are themselves the product of particular cultures. Gronseth et al. (2020) also posited that it was important for designers to recognise the cultural diversity in learners and to examine how this could contribute to the way they bridge their prior knowledge with new learning and the types of scaffold and tools that could enable successful learning.

In this vein, the research of McLoughlin and Oliver (2001) shed insight on the subject. In their research, they examined the design processes involved in the development of an online learning environment that catered for Indigenous Australian learners. They advocated the need to incorporate local values, ways of learning and cognitive preferences of the target population as well as to go beyond surface level design considerations, to attain culturally inclusive constructivist learning environments. It was in their view that instructional designers would have to follow design principles and instructional methods that best attain the desired outcomes so that they would be able to design culturally appropriate online units of instruction. Rather than applying a set of prescriptive theories, instructional design has to be sufficiently flexible and able to ensure that learning activities and tasks are designed to take learners' needs and perspectives into account. This finding was also reiterated by Scheel and Branch (1993), who observed that instruction which recognises and includes cultural backgrounds irrespective of subject matter domain, may be called culturally pluralistic instruction (McLoughlin & Oliver, 2000). They further argued that while there were many current instructional design models and paradigms

which could be interpreted as culturally and socially determined, these models included cognitive, social and pedagogical issues but may not acknowledge the need for cultural contextuality. Another observation echoing this can be found in the work of Reeves (1997), who outlined pedagogical dimensions that can be used to design multimedia tools and learning environments. One of these dimensions include cultural sensitivity, and they explained that internet-based instruction should accommodate varied ethnic and cultural backgrounds among the learners expected to use it. Henderson (1996) has argued that instructional design cannot and does not, exist outside of a consideration of culture and that it impinges on notions of cultural identity and cannot be culturally neutral.

In an attempt to explain how the dimensions of cultural contextuality can inform instructional design, Henderson (1996) first identified and offered several design paradigms which looked at including culture as a construct towards instructional design, each reflecting particular world views and consist of values, pedagogies, inclusions, and exclusions that result from the societal contexts of the designers themselves. From this, three identifiable approaches, all of which are limited with respect to cultural dimensions of learning and pedagogy, were found.

Table 2.9: Instructional Design Paradigms

ID Paradigm	Definition	Limitations
Inclusive or perspectives	• Acknowledges multicultural realities, driven by equity and social justice	• Soft multiculturalism • Inclusion of the exotic • Tokenism
Inverted curriculum approach	• Conceptualises society as unequal • Minority perspectives	• Does not cater for cognitive needs • Does not support equity in learning outcomes

Table 2.9 Continued

Culturally unidimensional	• Cultural minorities are invisible • Culture is presented as homogenous	• Dominant cultures only are acknowledged • Culture is represented as peripheral

Following this, Henderson proposed a multiple-cultural model of instructional design, which is characterised by an approach endorsing multiple cultural realities. This approach takes on a form of 'eclectic paradigm' which involves designing flexible learning resources to enable students to learn through interaction with materials that:

- Reflect the multicultural realities of society;
- Include multiple cultural ways of learning and teaching;
- Promote equity of learning outcomes

McLoughlin and Oliver postulated that the application of the multiple cultural model requires a universal and inclusive perspective, understanding to cultural difference and an appreciation of the abundant ways in which culture influences learning. It was observed that instructional designers need to consider the pedagogical dimensions of the cultures they are delivering resources for, and to be mindful of the numerous ways in which each culture could interpret instruction. This has also been reiterated by other researchers, seeing that it has been argued that one of the essential foundations of student-centred learning environments is cultural inclusivity with a focus on enabling learners to access learning resources in a manner that is congruent with their values, beliefs and styles of learning (Chen et al., 1999). This perspective would back the development of an

instructional design that would support local needs with high levels of cultural contextualisation.

Although the work of McLoughlin and Oliver was very much centred on the learning needs of indigenous Australian learners in an online learning environment, the design principles developed by them can also be used to build culturally appropriate instructional design for other indigenous communities. The ten design principles for culturally inclusive instructional design proposed by McLoughlin and Oliver are tabled in Table 2.10.

The findings were then summarised and guidelines for the design and features of planning online instruction for indigenous Australian learners. These guidelines were tabled in Table 2.11.

Table 2.10: Design principles for culturally inclusive instructional design by McLoughlin and Oliver

No	Principles	Explanation
1	Adopt an **epistemology** consistent with, and supportive of constructivist learning and multiple perspectives	Adoption of the community of practice model enables leaners to have access to community knowledge, support structures and shared interests This form of emancipatory pedagogy ensures recognition of students' capacity to construct their own knowledge, bring prior experience and culturally preferred ways of knowing to learning tasks and develop a sense of ownership and pride in their own knowledge.
2	Design **authentic learning activities**	In adult indigenous education, instructional design of educational programs must incorporate the skills and values of the community, its cultural traditions and its values and issues in order to create a unified and authentic learning environment. interactive, dialogic approaches have been found to equip indigenous students with the analytic and verbal skills they need to succeed in the contemporary world (Ryan, 1992; McCarthy et al., 1991)
3	Create **flexible tasks and tools for knowledge sharing**	One of the basic principles of instructional design is that indigenous learners should be able to share what they have constructed with others. This reinforces the social, collaborative focus of learning and creates and online community.
4	Ensure **different forms of support, within and outside the community**	One of the principles of a 'community of practice' is that there is scaffolding for novices until they develop skill and competence. In an online community, similar structures can be provided to learners through Web based tools
5	Establish flexible and **responsive student roles and responsibilities**	Awareness of student needs must inform the design process
6	Provide **communication tools and social interaction** for learners to co-construct knowledge	Learners should be able to access multiple channels of communication with tutors and with other learners

Table 2.10 Continued

7	Create **tasks for self-direction**, ownership and **collaboration**	For indigenous community members a sense of place is critical to identity and belonging. students can create their own sense of progress and decide on a learning path that will lead them to successful completion of the unit shared workspaces. students are encouraged to explore the wider learning space of the Web by searching for URL's and resources to augment the ones provided.
8	Ensure **flexible tutoring and mentoring roles that are responsive to learner needs**	the need for support, conversation and direction may be great at the initial stages of the course. Roles of tutors need to be interchangeable and modifiable in the light of student feedback flexibility and support can be built in by ensuring that tutors have an online presence that is visible, with help features and discussion forums providing learners with rapid feedback and scaffolding
9	Create **access to varied resources to ensure multiple perspectives**	This can be achieved by moving away from instructivist approaches where all texts are prescribed by the teacher to constructive approaches where learners actively add to the resources For indigenous learners the creation and inclusion of the indigenous perspectives is an important dimension and a means of recognising and integrating cultural knowledge
10	Provide **flexibility in learning goals, outcomes and modes of assessment**	learners should have control over their own learning goals, the topics they choose to research and the pace and sequence in which they access the resources. For indigenous learners studying online, flexibility in assessment is essential By offering choice and structure learners can develop self-knowledge of their own learning needs and levels of performance

Table 2.11: Guidelines for culturally inclusive instructional design

Cognitive/ cultural issue	Instructional design consideration
Awareness of learner needs and preferences	Instruction and learning tasks must support differences in learning style and communication
Communication and social interaction	Multiple channels and forums for communication between learners and tutors should be provided
Authentic task design	Learning activities build on diversity and provide bridges to the students' culture and community
Multiple perspectives and access to resources	Enable learners to create resources and to add culturally relevant sources of information. Emphasise learner input.
Scaffolding and support	Students need scaffolding or support structures to ensure that they develop skills and confidence. Include peer scaffolding in task design.
Flexibility in goals, modes of assessment and learning outcomes	Ensure flexibility and inclusivity by offering choice, multiple modes of delivery and assessment. Students should be able to choose their own pathways through the content and negotiate tasks for assessment.
Tutor roles	Create multiple roles for online tutors and mentors at various stages of the course to ensure provision of feedback and support
Collaboration and co-construction	Create motivating tasks where learners can share ideas and work on projects, drawing on cultural resources
Clear communication of aims, objectives and requirements	Plan for maximum clarity and ease of use, while designing for choice. Avoid assumptions about cultural stereotypes and expectations
Self-direction and integration of skills	Plan activities so that technology use and information access and become part of students' repertoire of study skills and lifelong learning strategies

As the guidelines outlined by McLoughlin and Oliver (2000) highlighted the considerations that must be taken in order to build culturally inclusive instructional design, the present study used these guidelines, together with the recommendations made by Henderson, Young and the indigenous community members, to guide the development of

an indigenised instructional design for the telecentre users at the research sites. McLoughlin and Oliver (2000) recommended that instructional designers start the process of culturally inclusive design by adopting the epistemology and pedagogy of social, constructivist learning and by acknowledging that learning is culturally and socially contextualised, the design process becomes grounded and located within the communities and individuals for whom the learning materials are intended. Tasks and environment design need to be imbued with the particular culture, values and expectations of the target group. By designing from a culturally informed, constructivist theory such as situated cognition or cognitive apprenticeship, instructional designers can plan activities where learning is a process of participation, communication and co-construction of knowledge (Branch, 1997).

To achieve this balance, instructional designers need to move beyond the narrowly prescriptive boundaries of current instructional design models. It was proposed that a multiple cultural model of design that caters for diversity, flexibility and cultural inclusivity in the design process affirms the social and cultural dimensions of constructed meaning.

2.9.2 Culture within the ADDIE Spectrum

One notable paper written by Thomas et al. (2002) aptly titled 'The Third Dimension of ADDIE: A Cultural Embrace' calls for the inclusion of culture into every phase of the instructional design process. The paper considers that education is not just a process of passing down knowledge, but rather it is a process of knowledge co-construction within socio-cultural context. The authors bring to attention the fact that while culture has been addressed, yet forgotten during the analysis phase in the field of

instructional systems design. Designers should aim to continue getting to know and understand the learner throughout the design process, as culture is very much a part of the formation of knowledge that it must underpin not only the analysis phase but all phases in the design process.

According to Thomas et al. (2002), in order for instructional design to be culturally inclusive, it was necessary to consider the expansion of the ADDIE model to reflect a third dimension of culture. They also stated that instructional designers need to understand the three parameters of Intention, Interaction and Introspection in order for this to be achieved.

1. Intention: Question their intentions to carry out the analysis, design, development, implementation and evaluation in a manner that is culturally sensitive and grounded in the notion that culture is inescapable, and seek out evidence that the integrity of the intentions remain clear;
2. Interaction: Interact with the people for whom they design because if culture and thought spring from human interaction and socialisation, then any knowledge of culture must be grounded in interaction; and
3. Introspection: Consider their own thoughts, beliefs, attitudes, desires, and feelings towards these cultures.

The authors also argued that while Henderson (1996) proposed the use of the multiple cultural model of instructional design to address the limitations of other instructional design models as the multiple cultural model is extremely culturally sensitive and that it is reinforced by the end-user in the development phase, it is important that introspection be seamlessly inserted throughout the instructional design process.

Clearly, a great amount of attention has been paid towards including culture in instructional design in the literature. Researchers continue to support the inclusion of culture as a part of the instructional design process (Young, 2010; Latchem 2018), as it was pointed out by Thomas et al. (2002) that when culture was not directly addressed in the design of instruction, a consequence of this would be that the design of the product would inadequately address the needs of the people for whom the instruction was designed for. The question now is, why is adding culture as a dynamic in instructional design still being advocated for today? In reference to the existing literature, some of the reported challenges faced with regards to the academic performance of indigenous peoples include the relatively higher dropout rates of students (Jessop & Williams, 2009; Hardwood et al., 2012; Leonard & Mercier, 2016; Wong & Osman, 2016; Olsen Harper & Thompson, 2017; Rosnon & Abu Talib, 2019), and relatively lower performance levels of indigenous students when placed into western-style learning environments and settings. Many studies have been conducted to see how to engage indigenous students in the classroom, from all over the world, Canada, Australia, New Zealand and even Malaysia, yet reports of successfully overcoming these challenges are scarce, as it has been observed that culture has yet to be fully embraced in instructional design. As Thomas et al. pointed out, many instructional design processes include culture as a component to consider in the initial stages, such as during the Analysis stages of the design process; however, more often than not, the products are seen as culturally neutral, rather than culturally sensitive or culturally appropriate, an opinion which was also reiterated by DeLorme (2018).

Therefore, this study intended to investigate if an indigenised instructional design that suits the needs of these indigenous communities could potentially strengthen their motivation to partake in learning activities. Particularly, this study explored the potential of

an indigenised instructional design when planning learning activities with indigenous communities at telecentres. The study used Young's ID-TABLET as a reference guide when designing culturally inclusive training at telecentres because this model has been recognised as one of the most comprehensive design frameworks that consider and pays attention to culture in the process of instructional design, which suited this study's objective of understanding the role of culture in indigenising instructional design.

2.10 Culture Based Model ID-TABLET

In the years of research conducted by Patricia Young, it was found that methods of integrating culture in design are limited and that the incorporation of culture in the design of ICTs will need original ways of engaging the design process.

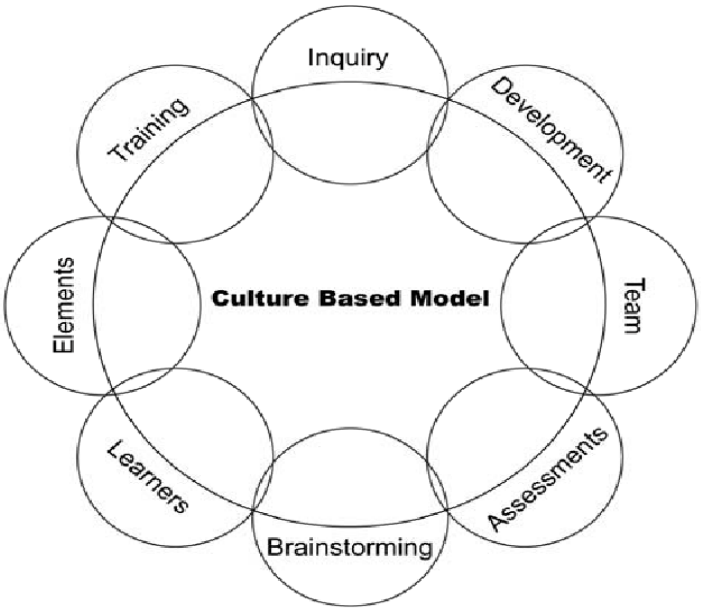

Figure 2.2: Culture Based Model ID-Tablet

With this observation, Young sought to establish culture as a design construct in instructional design while maintaining that her work maintains the traditional definition of

instructional design. Young proposed to use this framework to fill the gap where a complete framework to align culture with the ADDIE model has not been presented.

Young's culture based model ID-TABLET, as illustrated in Figure 2.2, is made up of eight areas of CBM, which include Inquiry, Development, Team, Assessments, Brainstorming, Learners, Elements and Training. Within these areas are 70 design factors that describe features of the areas, which are intended to aid the designer or researcher in understanding the intricacies of a society, culture, or target audience (Young, 2008). Several questions are used to further guide the ID-TABLET components, which act to explain how details and information can be derived accordingly.

Table 2.12: Guidelines for culturally inclusive instructional design

Component	Design factors
Inquiry	1. Genre 2. Framing 3. Omission 4. Backgrounding 5. Foregrounding 6. Visual representations
Development	1. Consider technical, aesthetic, content, culture-based, and target audience design specifications 2. Mass distribution formats 3. Effective technology 4. Diversity ICT format 5. Understand target audience 6. Explore environmental and individual/ group cultures 7. Quality design 8. Authenticate product 9. Control for interference 10. Model the product or process
Team	1. Cultural expert 2. Enlist educators 3. Culturally informed team

Table 2.12 Continued

Assessments	1. Multiple evaluation options 2. Assess the assessment 3. External review 1. Culture-specific assessments
Brainstorming	2. Financial support 3. Pilot studies/ field tests of product 4. Assess community's response 5. Community representative on team 6. Investigate target audience to authenticate product 7. Reflect and assess learning goals 8. Affordable design 9. Meet needs of target audience 10. Discuss and consider cultural context 11. Present and consider outcomes
Learners	1. Extend learning 2. Differentiate opportunities to learn 3. Empower and engage learners 4. Teach proactive learning 5. Identify educational objectives 6. Culture-specific instructional strategies 7. Enrich instructional content 8. Adapt instruction to learner 9. Plan for instruction 10. Enculturate the learner
Elements	1. Anthropology of culture 2. Psychology of culture 3. Science of culture
Training	1. Product training 2. Culture-based training

One of the main components of this model is Elements, which describes in detail the design factors that are representative of culture, including tangible and intangible qualities, across three main sections. These elements are detailed in the table:

Table 2.13: Design factors in the Elements component

Section	Design factors
Anthropology of Culture	1. Cultural aesthetics 2. Cultural artifacts 3. Cultural capital 4. Cultural classification 5. Cultural communications 6. Cultural demographics 7. Cultural environment 8. Cultural history 9. Cultural knowledge 10. Cultural language 11. Cultural physiology 12. Cultural relations 13. Cultural resources
Psychology of Culture	1. Cultural beliefs and values 2. Cultural experiences 3. Cultural ideas 4. Cultural identity 5. Cultural interests 6. Cultural misconceptions 7. Cultural ways
Science of Culture	1. Cultural anomalies 2. Cultural cultures 3. Cultural futures 4. Cultural infinities 5. Cultural nature

Research conducted by Russell et al. (2013) pointed out that existing literature on the role of cultural dimensions in instructional design is often reliant on the findings of Hofstede (1984), who defined culture as a programming of the mind. In the work of Wang and Reeves (2007), they relied on Sondergaard's (2002) review of Hofstede's cultural dimensions in their critique of his work. Russell et al. further expanded this critique and contrasted the findings of Wang and Reeves with the cultural elements of Young's culture based model.

Table 2.14: Comparison between Hofstede and Young (Russell, 2011)

Criticisms of Hofstede's cultural dimensions	Differences in Young's cultural elements
Used inappropriate instruments to measure culture	Derived from description and exploration of culture rather than measurement
Chose nations as the unit for studying culture	Chose a minority group within a nation as the unit for studying culture
Represented entire national cultures with participants from one company	Represented minority group culture with multiple artifacts from diverse settings
Derived from data that is old and obsolete	Derived from multi-disciplinary literature review and continuous qualitative data gathering
Presents four or five polaric dimensions of culture	Offers twenty-five descriptive elements of culture

When comparing the two works of research, Young's qualitative method of scrutinizing instructional design artefacts to stem the CBM framework bolsters her model against criticisms such as those made against Hofstede's method for deciding his cultural dimensions (Russell et al., 2013).

While the research of Young was primarily based on the backgrounds of people of colour in the United States of America, her CBM is not exclusively for only one group of the population, as the findings can be used to include other groups of indigenous peoples. In the present study, as inquiry was made into the role of culture within the indigenous communities in impacting their learning experiences, Young's model of culture was a framework referred to throughout the research order to understand how the ICT-literacy training programmes conducted at the telecentre during the initial implementation, as well as the community-led learning programme that ran at the research sites, fit into a culturally sensitive instructional design. Her framework also provided a guide to understand the perspectives of both the project team as well as those from community members. Referring to her design factors aided in understanding which parts of the design process interacted with the cultural elements of a community and how this interaction could elicit an ideal

system that can be used to strengthen motivation in knowledge sharing and knowledge co-creation among indigenous communities in Sarawak.

2.11 Knowledge Sharing

Nonaka et al. (1996) opine that knowledge is now more than just a resource but is the fundamental organisational resource in the current knowledge economy. However, this valuable resource is mostly possessed by individuals, who will need to partake in knowledge sharing activities in order for it to be passed on. Knowledge sharing has been defined as a process where "elders play an important role within the community and contribute in meaningful ways by sharing their knowledge of language, place and culture. The younger generations benefit from engaging with elders, hearing traditional stories, and learning their cultural practices" (Hausknecht et al., 2021). Lin (2007) offers another definition of knowledge sharing, which is that it is "a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organisation." Other definitions of knowledge sharing include a set of behaviours that encourage the exchange of acquired knowledge between individuals and teams (Chow & Chan, 2008), a personal act, which results in a mentally perceived value being attached to the leveraged knowledge (Swift et al., 2010), the act of exchanging ideas, experience through deliberations to create new knowledge (Bartol & Srivastava, 2002) and, the process of giving and receiving knowledge (de Vries et al., 2006).

Based on these different definitions of knowledge sharing, it can be surmised that the act of knowledge sharing is a social one, which involves interaction between individuals. Bandura's social cognitive theory describes human behaviour as a dynamic, reciprocal and interactive network of a triad of personal factors, behaviour and the

environment (Bandura, 1989). The emphasis put forward by this theory is that individuals often consider the environment, personal goals and social networks before committing or taking the initiative to share knowledge (Okyere-Kwakye & Md Nor, 2011). Perceived rewards that come with this initiative can be intrinsically based, in that individuals partake in these activities for the enjoyment of helping others, or it can be extrinsically based, relating to the expected rewards and potential benefits gained for their behaviour (Lin, 2007; Ford & Staples, 2010; Mansor & Saparudin, 2015).

The process of knowledge sharing allows for individuals to assist and collaborate with others to solve problems, develop new ideas, or implement policies or procedures (Wang & Noe, 2010). Individuals can choose to share both explicit and implicit knowledge with one another, and from this, create new knowledge (van den Brink, 2001). Knowledge sharing also leads towards significant impacts to the creation of a learning organizational culture, knowledge, and innovation (Casimir et al., 2012) through the identification of existing and accessible knowledge that can be transferred in order to solve specific tasks in a more efficient manner (Christensen, 2007).

Knowledge sharing very much depends on individual factors such as beliefs, experience, motivation, perceptions, attitudes, and values (Lin, 2007; Volady, 2013). On the other hand, organisational knowledge sharing depends on the feedback, contributions and participation from colleagues, the level of collaboration in and across the business units (Wahlroos, 2010).

2.11.1 Knowledge Sharing in Organisations

Nonaka (1991) posits that two types of knowledge exist within organisations, namely explicit knowledge and tacit knowledge. Explicit knowledge has been defined as

knowledge that is easily codified, storable, transferable, and easily expressed and shared. Sources of it are manuals, policies and procedures, and databases and reports (Serban & Luan, 2003). On the other hand, tacit knowledge concerns personal knowledge that is owned by an individual and can only be shared when the individual intends to. Examples of tacit knowledge include hands-on skills, best practices, special know-how, heuristic, and intuitions. Tacit knowledge is also personal in terms of context, is job-specific and is difficult to formalize and codify, difficult to capture, communicate and share, and poorly documented but highly operational in the minds of the possessor (Serban & Luan, 2002).

Efficient knowledge sharing among employees determines the success of knowledge management in organisations (Wang & Noe, 2010), and this is essential for organisations to have efficient knowledge sharing in order for sustainable development, long-term survival, and effective development of cooperation to happen (Kim & Tcha, 2012; Gaál et al., 2015). Jahani et al. (2011) state that individuals who possess the knowledge often recognise that their knowledge is a powerful resource, which can often lead to a "knowledge is power culture" that is characterised by knowledge hoarding and competitive behaviour among people within an organisation (du Plessis, 2007). It is acknowledged that for knowledge to be shared, individuals must be motivated to share it; however, this is also dependent on whether this knowledge is linked with attaining a competitive edge. Lee and Al-Hawamdeh (2002) posit that the fear of losing ownership of knowledge may cause the possessor of the knowledge to refrain from taking part in knowledge sharing activities, as this may mean the reduction of one's competitiveness. It was noted that in order to prevent this from happening, organisations should have strategies in place to promote knowledge sharing and creation.

McCall, 2008 (in Haradhan, 2019) found that there are four factors influencing knowledge sharing within the organisation, namely:

i) individual factor: this is closely related to one's behaviour to share knowledge with others;
ii) relational factor: refers to individual relationships in a group;
iii) informational factor: a complex type of knowledge; and
iv) organizational factor: this is related to the emotional bond between an individual and the organization

Knowledge sharing within the organisation usually involves staff members sharing and exchanging both tacit and explicit knowledge. van den Hooff and de Leeuw van Weenen (2004) opine that during the knowledge sharing practice, new knowledge is created through the process of knowledge donation and collection. Donation of knowledge happens when individuals within the organisation are eager and willing to share and give their knowledge to others through listening, discussion with others to develop their self-knowledge and solve problems quickly (Cummings, 2004; Lin, 2007). On the other hand, collection of knowledge occurs when the receiver of knowledge must consult colleagues through observation, listening or practice from internal and external sources, and encourage others to share their intellectual capital with them (van den Hooff & de Leeuw van Weenen, 2004; Lin 2007). Cultural factors that influence the creation of knowledge include an individual's self-motivation to share knowledge, the social relationship among individuals, and organisational culture (Lee & Al-Hawamdeh, 2002).

There significant differences between the ways that knowledge is shared within an organisation and the methods of knowledge sharing practised by indigenous communities, which is highlighted in the following section.

2.11.2 Knowledge Sharing among Indigenous Communities

Sharing of knowledge within the indigenous community is communal, with the community elders passing down their knowledge through narratives, song, dance. It was also observed in the literature that knowledge creation and sharing depends on the social, cultural practices and technological factors surrounding rural communities. It is observed that knowledge sharing among indigenous communities is vastly different from that in organisations. Indigenous communities acquire new knowledge primarily through observations and personal experiences, through the acts of doing and solving problems, as well as through the sharing of ideas with one another (Lwoga, 2010; Mtega et al., 2013; Kabita et al., 2021). Apart from that, indigenous communities often participate in formal and informal group discussions, whereby in formal group discussions, the community members would meet because of a specific reason and would discuss amongst themselves to share or solve problems together. By participating in activities like these, the community members are afforded the opportunity to share and create knowledge. On the other hand, informal sessions were mostly social sessions, whereby the community members would discuss topics of interest. Chilimo (2008) also reported that friends, families, and relatives often interact with one another, and through these interactions, new knowledge was shared and at times created. Barnhardt and Kawagley (2005) describes that basic skills and communal knowledge are shared simply through observation and imitation of the elders in the family. Based on the reported literature, it can be surmised that the ways indigenous

communities share knowledge are through observations, social interactions and discussions.

Khurram and Giangiulio, 2019 identified several barriers to knowledge sharing within the organisation, namely (i) communication, (ii) individual behaviour, (iii) trust, and (iv) organisational structure. There are also several levels involved when it comes to sharing knowledge within an indigenous community, as Daes (1993) reports that indigenous knowledge is a communal matter, and the consent to share knowledge depends on the type of knowledge to be shared. Similar to that of an organisational structure, indigenous communities also have their own hierarchical structures, and certain information or knowledge cannot trickle past certain levels of the hierarchy. Examples of this knowledge include sacred, secret and spiritual knowledge (Isaac, 2005).

2.12 Knowledge Co-creation

Although the terms knowledge creation and knowledge co-creation are not clearly distinguished within the knowledge management literature and are usually interchangeably used in that knowledge co-creation is a special case of knowledge creation, there is literature that suggests the distinction between the two constructs is that knowledge co-creation necessitates some extent of a collaborative process in building new knowledge (Lee & Cole, 2003; Puntambekar, 2006; Jakubik, 2008). Bagayoho et al. (2014) posit that people co-create knowledge when they share knowledge, but also when they are asked to collaboratively leverage their current knowledge to create new knowledge.

Knowledge creation is described as a process that results in the production of new knowledge, and a commonly used conceptualisation of this process observes that it is made up of four mechanisms: socialisation, externalisation, internalisation, and combination

(Nonaka, 1994). Bahayoho et al. (2014) offer explanations of these four mechanisms posited by Nonaka and Takeuchi, which are detailed below:

1. Socialisation: conversion of tacit knowledge to new tacit knowledge between organisational members (e.g., apprenticeship)
2. Combination: creation of new explicit knowledge by manipulating existing explicit knowledge (e.g., literature survey reports)
3. Externalisation: convert tacit knowledge to new explicit knowledge (e.g., articulation of best practices or lessons learned)
4. Internalisation: assimilation of explicit knowledge in action to the point that it becomes tacit knowledge

It was also observed that while knowledge creation can happen individually, more often than not, social interaction is an essential aspect of the knowledge creation process. It is when this social exchange involves individuals collaborating on a joint task that knowledge co-creation is said to happen.

Bahayoho et al. further explain that there are three different phases of the knowledge co-creation process, namely initiation, transition and normalisation and that these processes are facilitated by enabling actors. The initiation stage is the formative stage of the whole process, and it is during this stage that group members familiarise themselves with one another and test various approaches to their task. Transition happens when group members adjust to correct earlier problems and institute new arrangements, and the emphasis shifts from knowledge sharing to collaboration which will lead to knowledge co-creation. Finally, during the normalisation stage, the group makes the final effort to meet expectations and experiences both the positive and negative consequences of past choices.

It was noted that at this stage, the accumulated experience of a group could either effectively complete the task or impede the completion of the task.

Knowledge co-creation was chosen as a focus of this study considering that indigenous communities usually work together collaboratively on joint tasks, knowledge co-creation is more representative of what happens within the community, as compared to knowledge creation. The study did not examine all three stages of the knowledge co-creation process, but explored the first two stages of the co-creation process.

As knowledge sharing and knowledge co-creation within indigenous communities happen naturally to them, especially when engaging in learning activities, the question that comes to mind is whether the indigenous communities took part in knowledge sharing and knowledge co-creation activities when they were participating in the ICT literacy trainings, especially for the indigenous communities in Sarawak. In the event that knowledge sharing and knowledge co-creation did not happen at the telecentre, a logical question that follows would be to ask if it was because the communities were not motivated to do so?

2.13 Self-determination Theory

Self-determination theory was used to gauge the motivation of the community members to share knowledge and co-create knowledge with one another and others, especially if the three basic psychological needs of autonomy, competence, and relatedness are satisfied, and if these three needs were met with when the community members could use their own ways of indigenous learning as well as when the content of the learning activities and materials resonated with their own priorities and needs.

Self-determination theory (SDT) is a macro-theory of motivation and human development, which posits that individuals show optimal functioning (e.g., motivation, engagement, performance, and learning) when their basic needs for autonomy, competence, and relatedness are satisfied (Ryan & Deci, 2000). As a theory of motivation, development, and psychological needs, SDT is fundamentally concerned with providing students with significant opportunities for realizing accurate aims and developing capabilities that include curiosity, interest, confidence, access to resources, and empowerment (Neimiec & Ryan, 2009). SDT has been widely tested in various contexts, and results from these studies consistently demonstrate that when the basic psychological needs of autonomy, competence, and relatedness are satisfied, individuals will show greater motivation, learning, performance, and personal well-being (Ryan & Deci, 2000). SDT advocates that in order to foster both the growth tendencies and the social and emotional well-being of people, support for basic psychological needs is vital (Ryan et al., 2019). The three identified fundamental basic psychological needs are autonomy, competence and relatedness.

Autonomy refers to the sense of having free will and control over one's actions and behaviours and concerns an awareness of initiative and ownership in one's actions and is reinforced by experiences of interest and significance (Ryan & Deci, 2020). As has been argued in the literature, feelings of autonomy can be diminished if a person is placed in an environment that controls their behaviour (Amabile et al., 1976; Benware & Deci, 1984; Grolnick et al., 1991; Reeve & Deci, 1996). Comparatively, people are seen to thrive in environments where they can choose and are given the opportunity for self-direction, as they afford a greater sense of autonomy (Ryan & Deci, 2000). Competence, on the other hand, refers to the feeling of proficiency, a sense that one can accomplish and develop and

the need for competence is best satisfied within well-structured situations that offer ideal challenges, positive feedback, and chances for growth (Ryan & Deci, 2020). Relatedness concerns a sense of belonging and association and is facilitated by conveyance of esteem and caring (Ryan & Deci, 2020). It was also observed that thwarting of any of these three basic needs is seen as damaging to motivation and wellness. Accordingly, SDT's analysis of educational settings is primarily focused on the extent to which they meet or frustrate these basic needs. (Ryan & Deci, 2020).

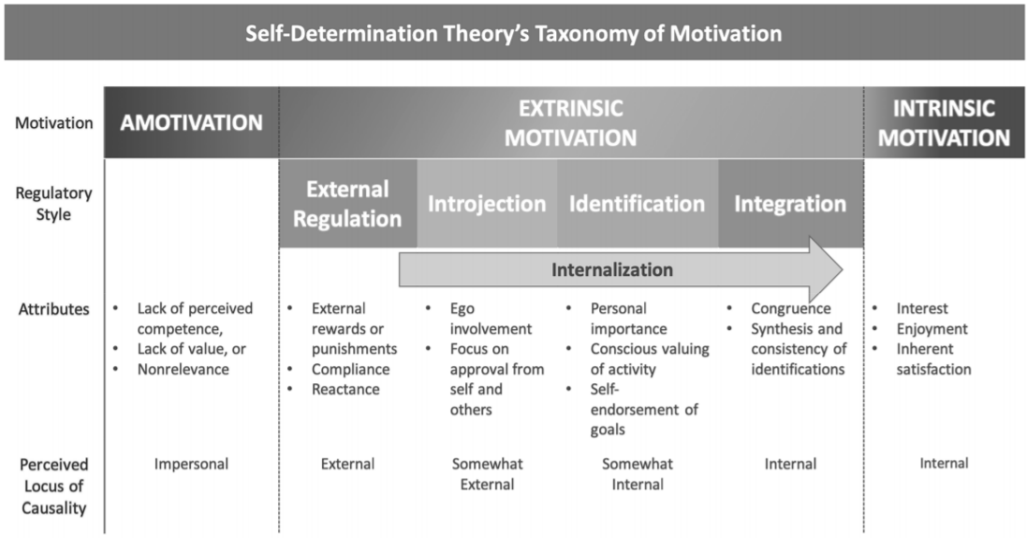

Figure 2.3: Self-Determination Theory's Taxanomy of Motivation

According to SDT, an individual's motivation is shown over a continuum and ranges from non-self-determined to self-determined. Three main categories of motivation are indicated in this continuum, namely ammotivtion, extrinsic motivation, and intrinsic motivation. The movement across the continuum is described based on the regulatory style of each category, beginning from external, introjected, identified, integrated, and intrinsic regulations. Ammotivation is used to describe individuals who do not possess self-

determination in their actions and is depicted as the state of lacking the intention to act. Ammotivation stems from non-value of an activity, feelings of incompetence, or not expecting an activity to yield the desired outcome due to a lack of contingency (Ryan & Deci, 2000; Ryan & Deci, 2002). External motivation is controlled by external, introjected, and identified regulation, and as individuals move across these regulations, it is seen that the person begins to head towards internalising their motivation. On the other hand, intrinsic motivation is described as "an inherent tendency to search for novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (Dincer & Yesilyurt, 2017).

2.13.1 Intrinsic Motivation

Reeve (2012) explains that people own innate growth tendencies (e.g., intrinsic motivation, curiosity, and psychological needs) that give a motivational foundation for their high-quality classroom engagement and positive school functioning. In this respect, SDT attempts to describe the conditions that foster and promote intrinsic motivation and curiosity, as well as those that undermine them. Deci and Ryan explain that intrinsic motivation pertains to activities conducted for an individual's own sake or for their integral interest and enjoyment (Ryan & Deci, 2020). It was further explained that play, exploration, and curiosity-spawned activities demonstrate intrinsically motivated behaviours, as they are not reliant on external incentives or pressure, but instead provide their own fulfilment and pleasures (Ryan & Deci, 2020). Deci and Ryan (2000) also state that it is vital to remember that intrinsic motivation will happen only for activities that hold intrinsic interest form an individual – those that have the attraction of originality, challenge, or aesthetic value for that individual. Intrinsic motivation is also seen to be the

likely reason for the multitude of human learning across the life span, as contrasted to externally directed learning and instruction (Ryan & Deci, 2017).

Malone and Leeper (1987) also suggest that activities are intrinsically motivating when people engage in it on their own volition, instead of wanting to receive some external reward or to avoid some external punishment. Intrinsic motivation is defined as learning that happens in a situation where the most narrowly defined activity from which the learning transpires would occur without any external reward or punishment. Intrinsic motivations are also seen to produce both (a) higher levels of sustained interest in the activity or the instructional content of the activity in future situations and (b) better learning of that instructional content.

They also identified several factors that could lead towards increased intrinsic motivation, such as:

i. Challenge: people are more motivated when they pursue goals with personal meaning and when attaining the goal is possible but not necessarily certain. These goals may also relate to their self-esteem when performance feedback is available.
ii. Control: People want control over themselves and their environments and want to determine what they pursue.
iii. Cooperation and competition: Intrinsic motivation can be increased in situations where people gain satisfaction from helping others. It also applies to cases where they are able to compare their own performance favourably to that of others.
iv. Curiosity: Internal motivation is increased when something in the physical environment grabs the individual's attention (sensory curiosity). It also occurs when

something about the activity stimulates the person to want to learn more (cognitive curiosity).

v. Recognition: People enjoy having their accomplishment recognized by others, which can increase internal motivation. (Malone & Lepper, 1987)

Literature on intrinsic motivation has largely considered learners within formal education and has shown that intrinsic motivation has played significant roles in terms of school achievement and higher performance (Taylor et al., 2014; Froiland & Worrell, 2016). Of late, a decline in the importance of intrinsic motivation for school-related activities has been reported in studies from multiple countries (Lepper et al., 2005; Gottfried et al., 2007; Gillet et al., 2012; Scherrer & Preckel, 2018), indicating that the conditions that support or foster these feelings of intrinsic motivation are not given sufficient attention. An analysis by Gnambs and Hanfstingl (2016) also suggests that conducive conditions need to be maintained or created as the decline in intrinsic motivation is associated with decreasing psychological need satisfaction. The opinions described here is well suited to the objective of this study, as the research is concerned with investigating if the learning condition provided at the telecentre can support these needs of indigenous communities and strengthen their intrinsic motivation to participate in knowledge sharing and knowledge co-creation activities.

2.13.2 Measuring Intrinsic Motivation

Researchers often rely on indicators to measure intrinsic motivation, which includes affective (e.g., interest and positive attitudes towards the task) and behavioural (e.g., time spent on the task during a free-choice period) variables. Many researchers opt to use behavioural variables when measuring motivation. On the other hand, Vellarand

(1997) used a different approach to measure motivation, as it was opined in his work that motivation must be measured independently from its determinants and consequences in order to provide conceptual clarity to the assessment of intrinsic and extrinsic motivation. According to Vallerand, by focusing on the "why of behaviour" mooted by McClelland (1985), equation of the operational measure of motivation with the conceptual definitions of intrinsic or extrinsic reasons for engaging in an activity could be done. The tying of this operational definition of motivation to its determinants and consequences could also be achieved without the problems of circularity. Using self-report questionnaires, Vellarand attempted to extract reasons for engaging in an activity and used this to reflect the various concepts of motivation before noting that endorsement of the reasons is then assumed to reflect the underlying motivation. Known as the Academic Motivation Scale, this set of questionnaires was developed to assess contextual motivation towards education and includes several measures of motivation at the contextual level, which aims to assess motivation towards various spheres of activities. Different subscales have also been combined in a self-determination index in order to derive a single score, and while this may be useful at times, it was opined that a multidimensional approach to motivation was preferred by the researchers (Vellarand, 1997).

Although quantitative approaches have been the most widely applied approach when measuring motivation, there has been numerous qualitative studies conducted that measure motivation. Indicators or questions from quantitative surveys are taken and adapted into open-ended questions, and responses are noted based on the expression of interest, perceived competence, perceived choice and tension.

2.14 Summary

In this chapter, a review of existing research that has been conducted over the years on the areas related to the current study was done. In the next chapter, chosen methodological approaches and the justifications for choosing these methods will be discussed.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Every research must be supported by research design and methodological approaches, with detailed explanations on the rationale for the strategies chosen and the flow of the work conducted throughout the research. For this study, the research relied on qualitative research methods to guide the investigation, for reasons explained below. Fieldwork was carried out on-site during 2017-2019, and some of the qualitative data sources used in the study included observations, semi-structured interviews, and document analysis (Myers, 1997).

3.2 Research Design

When considering the research design to be used in the study, the researcher had to first select a research approach that would resonate with both the goals of the researcher and the nature of the research topic. Considering that the research intended on exploring and understanding the learning experiences of the indigenous communities at the telecentres, the qualitative approach of inquiry was seen to the most appropriate method to be employed in the study, as qualitative research has been described as a way for exploring and understanding the meaning individuals or groups ascribe to a social or human problem (Creswell, 2009) and supports a way of considering research that honours an inductive style, a focus on individual meaning, and the significance of rendering the complexity of a situation (adapted from Creswell, 2007 in Creswell, 2009). Proponents for qualitative research agree that qualitative research methods involve the systematic collection,

organisation, and interpretation of materials derived from in-depth interviews or observations, which will then be used to explore the meanings of social phenomena as experienced by people themselves, according to their own experiences and in their own natural contexts (Malterud, 2001; Kaplan & Maxwell, 2005).

Several reasons underlie the decision to use qualitative inquiry for this research: namely, the research objective and the nature of the research questions guiding the study. Firstly, qualitative methods were well suited for the research questions of the present study, which aimed to understand "the *meaning* for participants in the study, of the events, situations, experiences, and actions they are involved with or engage in" (Maxwell, 2012, p. 221). According to Maxwell, meaning involves everything concerning the "participants' perspectives," including "cognition, affect, [and] intentions". The central research question guiding this study was primarily concerned with the meaning that indigenous communities assigned to their experiences with learning and training at telecentres, particularly as it related to their feelings of autonomy, competence, relatedness, and intrinsic motivation. Hence, qualitative methods were deemed appropriate for the current investigation.

Secondly, qualitative methods were also suitable for studies in which a problem or issue needs to be investigated (Creswell, 2013). Given the limited empirical research on the instructional design used at telecentres, particularly in terms of strengthening the motivation of indigenous communities to share knowledge and co-creating knowledge, little was known about the phenomenon that was being investigated in this research. Hence, qualitative methods were seen to be apt for exploring the phenomenon and highlighting some of its core attributes.

Finally, this research considered the nature of the subject studied, namely indigenous communities in remote and rural locations in Sarawak. A reason for choosing to do qualitative research instead of quantitative, which is usually the methodology of choice for research investigating motivation, was because a majority of the respondents participating in this study have limited literacy skills. Hence it was deemed that the most appropriate method of engaging them during the data collection phase was through semi-structured interviews.

3.3 Research Framework

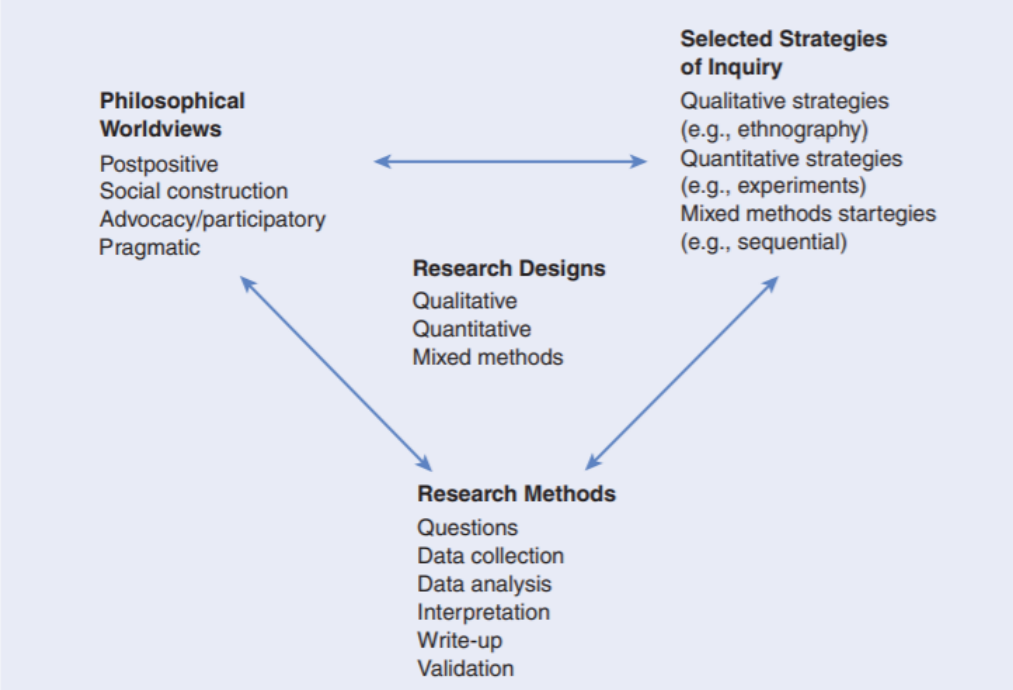

Figure 3.1: Framework for design

In designing the research framework for the current study, the researcher reviewed the different philosophical worldviews and chose the perspective that was most compatible

with the research interests of the study, as the choice would influence the outcome of the research (Poni, 2014). Peterson and Gencel (2013) articulated that philosophical paradigms are a basic set of beliefs that guide action and that there are four identified worldviews that researchers can consider, namely: positivist (or post-positivist), constructivist (or interpretivist), advocacy/ participatory, and pragmatist. Creswell (2014) also reiterated this, explaining that these four worldviews inform qualitative research and identify how these worldviews shape the practice of research. The current study opted to use the constructivist paradigm, as the goal of the social constructivist worldview is for individuals to seek meaning of the world in which they live and work, developing subjective meanings of their experiences. These meanings are diverse and manifold, leading the researcher to look for the intricacy of views rather than narrow the meanings into a few classifications or ideas (Cresswell, 2009).

Peterson and Gencel (2013) also observe that when conducting research under the social constructivism lens, the queries become wide-ranging and general so that the participants can create the meaning of a situation, usually forged in dialogues or interactions with other people.

Through this lens, the researcher focused on specific contexts of the lives of people in order to understand the historical and cultural settings of the participants, with the intention of interpreting the meanings that they had about the world. Crotty (1998) identified several assumptions when discussing the constructivist paradigm, namely:

1. Meanings are constructed by human beings as they engage with the world they are interpreting; therefore, qualitative researchers tend to utilise open-ended questions in order to engage the participants into sharing their views

2. Humans engage with their world and make sense of it based on their historical and social perspectives as we are all born into a world of meaning bestowed upon us by our culture; thus, qualitative researches seek to understand the context or setting of the participants through visiting this context and gathering information personally.

Considering that the constructivist paradigm places a heavy emphasis on the construction of knowledge and reality through social interaction, the collective sharing of the knowledge as compared to the individual experience, this paradigm was therefore seen to be appropriate for the purpose of this study. As the objectives of the present research was to access the interpretations indigenous community members of their experiences with learning activities at the telecentre, as well as their ways of knowledge sharing and knowledge co-creation as a community, the constructivist paradigm of research was suited to understand these situations and phenomena. Using the constructivist paradigm also allowed the researcher to pursue and highlight the multiple realities of their experiences, rather than uncovering single realities.

The researcher acknowledges that these personal observations and analysis of the data represent just one possible interpretation of this phenomenon.

3.4 Research Site Selection

Having decided upon the research design that the present study would undertake, the researcher then decided on the research sites that would be used for the study. Considering the objectives of the research, it was decided that the sites involved in the study would comprise of sites where telecentre projects had been carried out with indigenous communities. To identify these sites, the researcher engaged in conversations with the CoERI team members who had initiated the eBario, eBa'Kelalan and eLamai

telecentre projects in remote, rural locations in Sarawak. Based on these conversations, three sites were identified as being suitable research locations, in line with the objectives of this study. Before the characteristics of the sites are discussed, a brief overview of Sarawak and its contextual features will be first laid out.

Sarawak is situated in Borneo, a tri-nation island state comprising the Malaysian states of Sarawak and Sabah, the Sultanate of Brunei, and the Indonesian province of Kalimantan. As the largest state in Malaysia, Sarawak is less populated and less industrialised in comparison to West Malaysia; however, the state is rich with bio-diverse rainforests, lengthy shorelines and natural resources, which are primarily timber, oil and gas.

The state's population is widely spread out, with a large percentage of the people living in rural areas. Sarawak's rough terrain and vastness of the state has limited the extent of land transport accessibility into the interiors, and some places remain only accessible via river transport or small planes. Present road infrastructural plans for the state is the Pan-Borneo highway project, which will enhance the existing coastal road infrastructure, which is currently known as the Trans-Borneo highway. As 64% of Sarawak's total land area is covered with primary and secondary forests, air transportation remains the most practical means of transportation to connect remote, sparsely populated, or otherwise inaccessible parts of the state with the rest of the country.

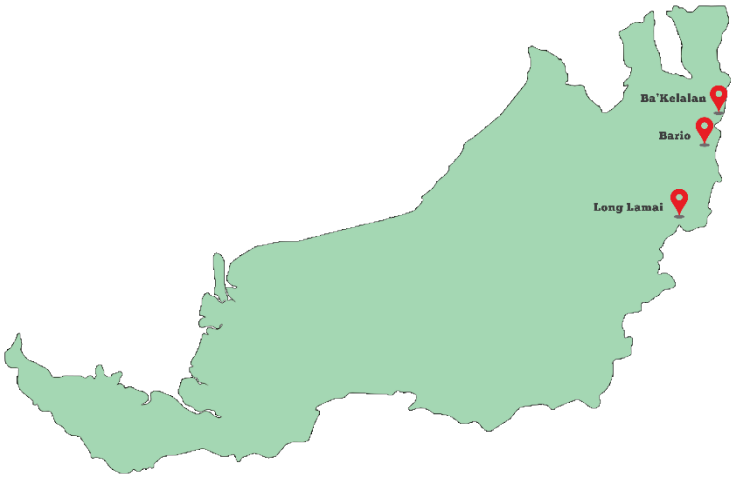

Figure 3.2: Map of Sarawak and research sites

Sarawak is divided into three regions coastal lowlands comprising peat swamp as well as narrow deltaic and alluvial plains; a large region of undulating hills ranging to about 300 metres; and the mountain highlands extending to the Kalimantan border (Government, 2020). With a population of over 2.8 million (DOSM, 2020), Sarawak is home to over 20 different ethnic groups, of which are tabled below:

Table 3.1: Ethic demographics of Sarawak

Major ethnic group	Iban, Malay, Chinese and Bidayuh
Sarawak Indigenous Races	Bidayuh, Bisayah, Dusun, Iban, Kadayan, Kelabit, Kayan, Kenyah (including Sabup and Sipeng), Kajang (including Sekapan, Kejaman, Lahanan, Punan, Tanjong and Kanowit), Lugat, Lisum, Malay, Melanau, Murut or Lun Bawang, Penan, Sian, Tagal, Tabun, Ukit

Common languages widely spoken in the state include Bahasa Melayu, English, Mandarin, Iban, as well as other local dialects, and the main religions practised in Sarawak are Islam, Christianity and Buddhism (Unit, 2017).

Education in Sarawak is administered at the Federal level by the Malaysian Ministry of Education (MOE). The state, however, is responsible for coordinating educational matters in Sarawak, which is placed under the purview of the Sarawak Education Department. The education system follows that of Malaysia, whereby it is divided into several stages: early childhood, primary, secondary, and tertiary education. While education in government schools is provided free of charge to citizens, only primary level education is compulsory in Malaysia.

In recent years, Malaysia has started to place emphasis on introducing ICT into the education system, as evidenced in the Malaysia Education Blueprint 2013-2025. As the state moves in the direction of technology integration in the classroom, schools in Sarawak are now striving to meet the latest Smart Schools Qualification Standards. In 2019, it was noted by the then State Education Director Dr Azhar Ahmad that 93.68% of 1,457 schools in Sarawak had achieved the minimal standard of three-star ratings in technology integration in the classroom. However, while this number was commendable, he also noted that there were still 92 schools, located mostly in the rural and interior, that needed assistance and intervention to boost their ICT usage to reach the minimum level of three stars (Aubrey, 2019).

3.4.1 ICT Situation in Sarawak

The statement above highlights the current ICT situation in Sarawak, whereby the penetration of ICTs in localities at remote and rural areas are greatly disadvantaged in comparison to their urban counterparts. As Malaysia's digital / ICT infrastructure development has been concentrated primarily in its cities and towns (Mohd Noor & Kassim, 2007), digital infrastructure distribution on a geographical basis has largely

reflected regional inferences in economic development and population density with the predominantly rural states of Sabah and Sarawak falling far short of the national average. Such disparities are especially apparent in remote locations of Sarawak, where access to basic infrastructures such as electricity and water are also limited. As of 2020, many areas in Sarawak have yet to receive comprehensive and stable communications coverage, especially in rural areas, due to geographical challenges and lack of electricity supply (Sayed Umar et al., 2021) Plans are in place to increase connectivity in underserved regions of the state, as evidenced by the announcement made by the Malaysian Communications and Multimedia Commission (MCMC) stating that a total of 600 telecommunication towers throughout the state will be built under the SMA Rural Transformation project (Lim, 2020).

3.4.2 Telecentre Initiatives in Remote Sarawak

In an effort to bridge the digital divide in Sarawak, particularly among communities that are located in remote and rural locations, an initiative to bring ICTs to these locations was spearheaded by a research team from Universiti Malaysia Sarawak (UNIMAS). The team sought to introduce ICTs to indigenous communities; however, several criteria were adopted by the team as guidelines in the design, planning and implementation of the project.

The predetermined criteria were:

- Extreme cases: Establishment of the telecentre at locations that did not have road access, 24-hour power supply, and telephone connectivity.
- Holistic approach: The rollouts do not only cover ICT infrastructure and usage but will also cover social aspects, support infrastructure, and economics

- Research components: An outcome of the project would be a methodology/ approach based on lessons learnt to enable replication
- Capacity building: That the collaboration will ensure the building up of expertise in the area of Rural ICT. This follows the 'training the trainers' concept, whereby these trainees will become trainers to pass forward the information to other organisations.

(Source: CoERI, 2010)

These criteria were determined so that their project would be different from other existing initiatives in Malaysia, such as the Medan Infodesa (MID) and Pusat Internet Desa (PID). Upon deliberation, the first site chosen to establish a telecentre was in Bario.

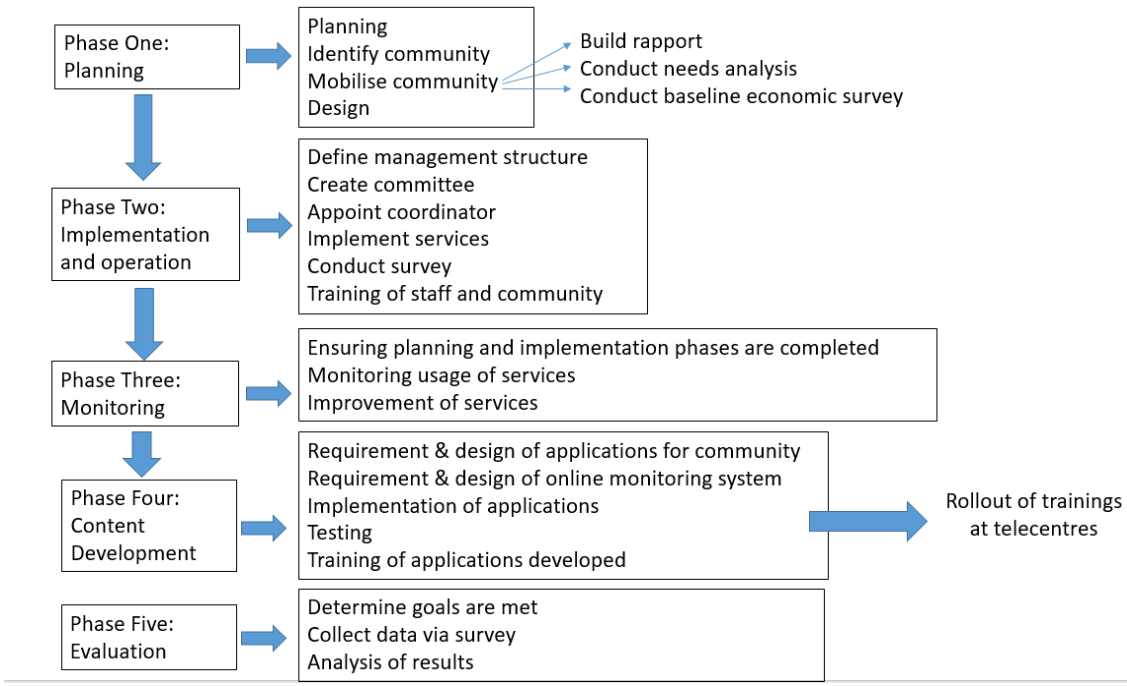

Figure 3.3: Phase of telecentre establishment (Adapted from coeri documents)

The eBario project was first initiated in 1998 in Bario, which is located on the remote plateau in the Kelabit Highlands on the island of Borneo, in the state of Sarawak. It is surrounded by densely forested highlands, some rising to as high as 2,400m above sea level. The highlands include Sarawak's highest peak, Mount Murud, and has the largest remaining rural concentration of the Kelabit people, with roughly 1000 individuals scattered around a dozen distinct communities. The community's main economic activity is agriculture, mainly growing Bario rice. The cool climate is also well suited for the cultivation of citrus fruits. Bario is also famous for its Bario made salt and the refreshing Bario pineapple.

The objectives of this telecentre project, also known as the eBario Telecentre, or Gatuman eBario, were to demonstrate that access to ICTs, specifically the Internet, could precipitate significant improvements in the lives of such communities. Central to this strategy is two measures: to provide the community with access to the Internet and assess the impact that it would have. As part of the program, the researchers spent time with members of the community in order to understand their living condition, their culture, the existing uses and accesses to information sources and their needs for improved information delivery. Baseline studies were conducted in order to understand the conditions of life in the community. In this way, a number of prioritised proposals for information systems utilising the Internet were agreed upon with the community representatives (Bala et al., 2002).

Public telephones, computers for the two schools, a community telecentre with computers and with satellite access to the Internet were provided for the community through the implementation of this project. The telecentre supported education, e-

government services, e-commerce, e-health, telemedicine and personal communication. It was powered by an innovative hybrid system of solar panels and a diesel generator. Internet access was provided through the use of solar-powered VSAT (very small aperture terminal), a satellite telecommunication system, a pioneering application of this technology in rural Malaysia.

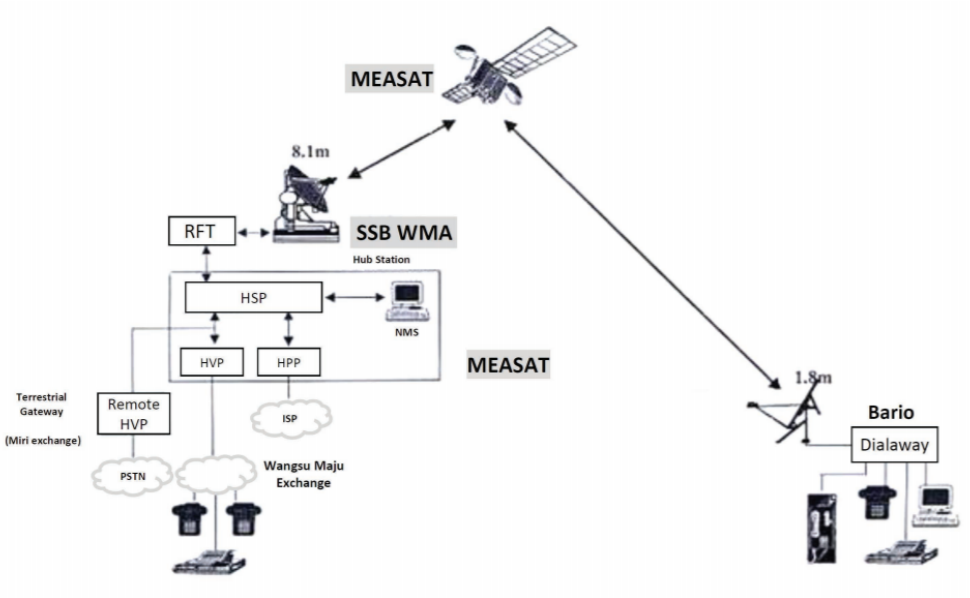

Figure 3.4: eBario architecture

The impact of the eBario project as a successful bridging-the-digital-gap project (Yeo et al., n.d.) culminated in the development of the eBario model, which is a set of characteristics found by the researchers throughout the implementation of the project (CoERI, 2010). The eBario model provided the necessary guidelines needed to replicate the success of the telecentre project at other locations, which are:

1. Emphasis on people, social relations, and local context rather than just the functions of the technologies

2. Defines actual needs of the community and attempts to provide relevant technologies that can serve that needs
3. Acknowledges and works with local champions who can lead, motivate and mobilise members of local communities – act as catalysts and motivator, and vision carriers
4. Capitalises on local strengths and resources in the development of telecentres (planning, implementation and operation, evaluation and monitoring) of the telecentres. Members of local communities participate in the decision-making process, from problem identification to solutions in the community, leading to a greater sense of responsibility and ownership.
5. Develops sustainability models to ensure the existence, growth and continuous relevance of the telecentres in local communities
6. Fosters and develops smart partnerships with government agencies and non-governmental agencies such as the industry, NGOs, and community.
7. Provides ongoing training and education of telecentre personnel and members of the community. This training is not only on application or usage of technologies but also on the management of the technologies in terms of troubleshooting.
8. Evaluates the performance of the telecentre to assess its financial sustainability and continuous relevance to the needs of local communities.

Following the eBario project, two other telecentres were established in remote and rural locations in Sarawak by the research team, namely Ngerabit eLamai and Tutum Bala eBa'Kelalan. The replication of these telecentres was based on the eBario model, which is a set of guidelines developed by the research team based on the experiences learned from the eBario project (Yeo et al., 2012).

Figure 3.5: Ngerabit eLamai

The second telecentre site was Ngerabit eLamai, Located close to the border between Indonesian Kalimantan and Sarawak, Long Lamai is one of the biggest and oldest settlements of the Eastern Penans in Sarawak, with 450 inhabitants. Its remote location makes travelling to Long Lamai somewhat of an adventure, as there is no direct road access to the village, and visitors have to fly to Miri to Long Banga (or drive 8 hours over logging roads) and take a 1.5 hours' boat ride (or an hour of hiking through dense rainforest) before they can reach Long Lamai. The infrastructures available at Long Lamai include a primary school, church, and a football field. There is limited access to communication facilities in this remote village.

The Penans were once nomadic in the recent past, and the community at Long Lamai currently live from farming today. However, they are still dependent on the forest for hunting and collecting various forest products. The people of Long Lamai are

subsistence farmers, growing paddy, fruits and vegetables for their own consumption and for sale. The selling and buying activities occur both in the villages of Long Lamai and Long Banga.

Ngerabit eLamai provided similar facilities at the eBario telecentre such as the provision of computers, telephones, and services such as printing and photocopying. The establishment of the telecentre in 2009 also allowed the community to partake in various activities such as e-commerce and e-tourism. Other projects that have been successfully initiated at Long Lamai include the Indigenous Knowledge Governance Framework (Toro), Grassroots Grant Assistance for Human Security Project from the Government of Japan under Official Development Assistant (ODA) for Long Lamai electrification using Micro Hydro, Energy Optimization for Rural ICTs Telecentre, Initiative for e-Commerce Capacity Building of Penans in Long Lamai, Sarawak, Ngerabit eLamai: ICTs Supporting Socio-economic Transformation and Constructing a Competitive Rural Tourism Competency Index for Rural Tourism Destinations in East Malaysia (TPOA, n.d.).

Figure 3.6: Tutum Bala eBa'Kelalan

The third telecentre site was Tutum Bala eBa'Kelalan. Ba'Kelalan is located approximately 3000 feet above sea level in the heart of Borneo and is situated 4km from the international border between Sarawak and East Kalimantan and 170 km from the closest town, Lawas. The area is surrounded by some of the highest peaks and mountain ranges found in Sarawak. To the east is Apo Duat, a mountain range that separates it politically from East Kalimantan. Mount Murud, the highest mountain in Sarawak at 7900 feet, is located to the west of Ba'Kelalan. As a result of its remote location, Ba'Kelalan is outside the national grid and is with unstable communication and information structures.

Derived from the Kelalan River and Ba', which means wetlands in the Lun Bawang language, Ba'Kelalan consists of a group of 9 villages in the Kelabit Highlands: Puneng Kelalan, Long Muda, Long Kumap, Long Langai, Long Lemutut, Long Ritan, Long Rusu, Telal Buda' (Buduk Nui), Long Nawi (Buduk Nui), Long Rangat, Buduk Aru', Long Uba, Pa' Pala, Pa' Tawing, administratively known as Central Ba'Kelalan. The main economic activity in the area is the production of adan rice (also known as Bario Rice). Villagers also rear buffaloes and other domesticated animals as a source of income. The community is also known for the production of salt, as well as the Ba'Kelalan apple.

With a population of around 1500, the residents of Ba'Kelalan mostly belong to the Lun Bawang indigenous people, although several thousand people call the highlands home. Ba'Kelalan's remote location has resulted in the area lying outside the national grid with unstable communication and information infrastructures. There had been situations whereby villagers had to track for about 2 hours over to East Kalimantan to make phone calls, especially if there is an emergency. The community also relies on the radio for news and information. Due to this fact, the Lun Bawang people have shown great interest in

accepting and exploring the ways in which ICT, particularly the Internet, can support rural development in the villages.

The Tutum Bala eBa'Kelalan telecentre was established in 2010 and is a double story building that serves as both a computer centre on the upper level as well as a café and gallery showcasing community products on the lower level. Some of the facilities and services provided for at the telecentre include photocopying services, basic letter writing, and access to printers and scanners. The eBa'Kelalan Cafe was built mainly with the objective of getting the community to come together as a meeting point when having discussions, meetings and also for fellowship. The gallery room is used as an exhibition hall for the community to showcase their handicrafts, drawings and also local crafting.

The establishment of eBa'Kelalan telecentre highlights the enthusiasm that the community has towards using technology to propel themselves forward, and community members from each village were all actively involved from the beginning consultation to the management processes and implementation of events related to the telecentre project (Bala, 2012).

3.4.3 Rationale for Site Selection

One of the main factors which led to the identification of these three potential sites is because of the communities involved. All three sites had telecentre users that mostly consisted of indigenous communities; hence these sites were ideal in order to study if the training methods used by the trainer teams were suitable to be used within indigenous communities.

Aside from that, the communities at the research sites also consisted of a community of elders and younger generations and still practised many of the knowledge sharing traditions that are prevalent within indigenous communities (Harris & Harris, 2011). Investigation into the types of teaching and learning methods used within the community, giving insight to the perceptions of the indigenous communities towards teaching and learning, could be conducted if these sites were selected as research locations. The researcher could also find out in-depth if the current practices used in telecentres were aligned to the learning goals of these indigenous communities and would shed light on whether these were the best practices that can be used when designing learning for indigenous communities.

According to Morse (1994), the selection of the site is a vital part to consider when designing a qualitative investigation, and it was suggested that the setting of the research be determined earlier on in the research process in order to ensure access to the site. Flick (2006) reiterated this finding, as it was found that gaining access is often the most difficult part of the interview process. The observations made by Morse (1994) and Flick (2006) is especially relevant to the present study, as the current research involves indigenous communities located in remote, rural Sarawak. Hence, as it was important that the researcher understood indigenous research approaches as the main respondents for this study belong to indigenous communities, it was, therefore, pertinent to consider indigenous methods and perspectives when conducting research. Mooted by Smith (1999), the indigenous research approach views indigenous peoples as research partners rather than research subjects. Indigenous methodologies also "tend to approach cultural protocols, values and behaviours as an integral part of methodology", and "are 'factors' to be built into research explicitly, to be thought about reflexively, to be declared openly as part of the

research design, to be discussed as part of the final results of a study and to be disseminated back to the people in culturally appropriate ways and in a language that can be understood" (Smith, 1999, p.15).

Research involving indigenous communities in Sarawak also share the same priorities as highlighted by Smith (1999). As was pointed out by Winschiers-Theophilus et al. (2015), there is a process involved when working with indigenous communities known as cultural protocols. These cultural protocols emphasise on "free, prior and informed engagement process, development of mutual understanding and respect for customary laws, values and decision-making processes, particularly those concerning stewardship of resources and territories" (Winscheirs-Theophilus et al., 2015, p. 101). Researchers were advised to abide by certain practices that were considered to be respectful of the cultural norms of the communities, such as gaining community consensus when conducting research, planning timing so as to not inconvenience the community, consideration of the local context of the communities, and to not disregard the rules of the community.

Bearing these observations in mind, the researcher sought to include the respondents as research partners, paying close attention and being sensitive towards their cultural structures and protocols. Throughout the interview process, the researcher worked towards building a shared understanding about the partnership role with the participants, whereby the participants were the co-constructors of the research, and that the researcher would conduct the research by observing their indigenous protocols and respecting their ways and culture. As co-constructors of the research, the participants' voices were collected using qualitative methods of interviews and observations, which provided a

closer understanding of the perspectives and thoughts of the indigenous communities involved.

In order to facilitate the selection, entry and access process, discussions were first held with the project team members involved in the telecentre projects to determine which sites would be suitable for the purpose of this research. Upon identifying these potential sites, the researcher proceeded to meet with the telecentre managers as well as some of the community members at all three sites to explain the objectives of the study and to gauge their interest to participate in the research. The researcher was able to obtain consent and agreement from the community members to pursue the study at each site, and upon completion of this phase, the researcher then proceeded to consider if it was feasible to pursue the data collection at all three locations, as the study would be conducted by a lone researcher. Aspects such as financial resources, availability of the community members to participate in the interviews as well as transportation into the sites were considered; however, due to the limited number of potential respondents, it was decided that the study should include all three research sites. It was also at this point in time that an opportunity to assist with another project, a community-led learning programme, at the research sites were presented to the researcher; hence, the financial constraints of this research was reduced, making it easier for the researcher to access the research sites.

3.5 Participants

Once the sites had been determined, the researcher then proceeded with the recruitment of participants or informants of data who would be involved with the study.

3.5.1 Sampling

According to Hennink et al. (2018), sampling in qualitative research involves people who are to be observed or interviewed and includes settings, events, and social processes. The selection of study participants is significant to ensure the quality of the data gathered. Due diligence must be given towards the selection of a sample pool that can act as the right informants for the study. Bowen (2008) noted that an "appropriate sample is composed of participants who best represent or have knowledge of the research topic, with the objective of ensuring efficient and effective saturation of categories, optimal quality of data and minimum dross".

For this research, the approach used was the purposive sampling approach (Creswell, 2012; Tanner & du Toit, 2015) for the reason that there was a limited set of individuals who were able to provide the necessary information with regards to the telecentre, as well as indigenous ways of learning at the research sites. The significance of purposive sampling lies in the selection of information-rich individuals, and the respondents for this study were purposively sampled because (i) they could give an insightful and detailed understanding of the learning activities at the telecentre, and; (ii) they could provide information on the indigenous ways of learning within their own communities as they were either directly involved in the establishment and rolling out of these telecentres, or they are elders of the community who are the key holders of the indigenous knowledge and traditions of the community.

The three categories of research participants who were selected for this research were:

a. The team of trainers and researchers from the research institute that initiated the telecentre projects at all three sites;

b. The indigenous community members at all three research sites, belonging to the Kelabit, Lun Bawang and Penan indigenous groups; and
c. The indigenous community members who participated in the community-led learning programme

The snowball method (Browne, 2005) was also employed to recruit a selection of participants. During the initial stage of interviews, the researcher was able to connect with several trainers and the project manager for the telecentre initiatives at the research sites, who in turn suggested a few possible respondents that might still be living at the locations. These respondents then introduced the researcher to a larger pool of potential participants who were still living at the research locations, who then recommended other community members to participate in the interviews. The process underwent by the researcher accurately describes snowball sampling, where the initial key participants would provide suggestions on other participants who could contribute valuable data to the research (Hennink et al., 2018). Table 3.2 shows a list of the key respondents who were interviewed.

Table 3.2: Research Informants/Participants

Institutions	People Interviewed	Content of Interviews
Institute / Experts	Project site leader	Project planning and implementation, experiences with community members
	Project manager	Project planning and implementation, design of training programmes, experiences with community members
	Trainers	Design of training programmes and training modules, instructional design of training, methods used when implementing training, reflection on training sessions, experiences with community members, community motivation when undergoing training

Table 3.2 Continued

Telecentre research sites	Managers	Implementation of the training programmes, train-the-trainer programmes, feedback from the community, changes to modules, approaches to the instructional design used during the training
	Users	Telecentre: Expectations of the training, learning experiences at the telecentre, satisfaction with telecentre and training at the telecentre, instructional design, community ways of learning, knowledge sharing and knowledge co-creation activities at the telecentre, feedback to the training, overall perceptions of the training programme
		Community-led learning programme Learning experiences, satisfaction with the community-led learning programme, delivery methods of content, knowledge sharing and knowledge co-creation, feedback on and overall perceptions of the programme
	Non-users	Telecentre: Expectations of the telecentre, perceptions of the training, desired changes to the training programme
Community	Elders	Community ways of learning, priorities of the community, knowledge sharing and knowledge co-creation practices within the community, what does the community want to share, expectations of the telecentre and other training projects with the community

Through the snowball sampling process, the researcher was able to conduct several interviews with a larger group of respondents than expected, as many of the telecentre users had already moved away from the research locations. However, there was a concern as to the number of respondents that were successfully recruited for the study, as the numbers were relatively small; hence the researcher looked into literature regarding the appropriate sample size for a qualitative study.

3.5.2 Sampling Site

In the present study, a total of 17 interviews and two focus group sessions, with a total of 13 participants during each session, were held with the participants at the three sites between 2017 and 2019. At the first site, five respondents comprised of telecentre users and managers and two community elders, whereas at the second site, the respondents comprised of one telecentre manager, two focus groups, two telecentre users and one village head. At the third site, the respondents comprised of six telecentre users. The sample size varied according to the number of respondents recommended by the telecentre managers and community elders, as well as those who were able to commit their time to participate in the interviews. In this study, saturation was seen to occur as the interview process progressed, and no new information was forthcoming from the respondents; hence the researcher did not request for more nominations of potential respondents from the community.

3.6 Data Collection Instruments

Data collection methods for this study included open-ended interviews, observations, and reviews of document data. The data collection instruments utilised during the study comprised of interview guides developed based on existing questionnaires measuring self-determination theory, previous research with indigenous communities (Deer & Falkenberg, 2016) for the individual interviews with the respondents, a discussion guide based on similar constructs to the interview guide for the focus group discussions, and field notes.

3.6.1 Interviews

According to Patton (2015), there are three fundamental methods to collecting qualitative data through open-ended interviews, which include informal conversational interviews, standardised open-ended interviews, and the general interview guide approach (Butina, 2015). In the present study, the researcher opted to utilise semi-structured interviews to collect data from the respondents, documenting the narratives from them. Several interview guides were used throughout this process, outlining the general topics that would be discussed with the different pools of informants. The first group of respondents comprised of the trainer team from the research group (Appendix 1), whereas the second group of respondents were the telecentre managers at the research sites (Appendix 2). A small group of community members were interviewed for the preliminary interviews (Appendix 3) and a different interview guide was used for the larger group of community members interviewed subsequently (Appendix 4). As there were focus group interviews conducted at Ba'Kelalan, a separate interview guide was used for them (Appendix 5), and the main reason why focus groups were used in Ba'Kelalan was because the participants to the interviews had limited time available for the interviews and had requested that they all met together as a group as opposed to individual sessions. As for informants who had participated in the community-led learning programme organised at both Bario and Ba'Kelalan, a separate interview guide was also used for this group (Appendix 6).

Various interview guides were used to ensure that the relevant themes were covered; however, the guides did not impede or detract the interviewer from exploring pertinent topics that the informant brought up during the interview. The interviews were

mostly conducted on a one-to-one basis, although under some circumstances, the researcher also had focus group sessions with the community members.

3.6.2 Interview Process

The interview process in the present study followed the recommended suggestions put forth by Hennink, Hutter and Bailey (2018), who listed the following steps to be attempted by interviewers in order to gain access to explanations of participants:

- Use of a semi-structured interview guide to prompt the data collection (interview guides used for the current study are provided in the Appendix);
- Establishing rapport between the interviewer and the interviewee;
- Asking questions in an open, empathic way;
- Motivating the interviewee to tell their story by probing

The interview process proceeded much like a dialogue between the participant and the researcher, and the questions posed to the respondent were open-ended, with the researcher making an active effort at building rapport with the respondent. The interview sessions were conducted using interview guides, or a list of open-ended questions to ensure that all topics were explored. Conversations about the personal and learning experiences of users of the telecentre, the trainers, the project initiators, as well as community elders were conducted. During the interview, the researcher attempted to generate knowledge and meaning about their experiences with the ICT literacy training programme telecentre, and in subsequent sessions, their insight on the community-led learning programme. Participants were encouraged to speak freely, but subtle questions were used to prompt them to the issues that were under discussion. The goal for this was to obtain rich contextual data that can be used for analysis and to answer the research questions of the

study. The researcher also interviewed the same informant several times throughout the data collection period to discuss certain issues in-depth and to confirm if the information was conveyed correctly according to their meaning. Through these interviews, the researcher was able to deeply explore the feelings and perspectives of the respondents by using an open-ended, discovery-oriented method (Guion et al., 2011).

All interviews were carried out at the research sites at a time convenient for the participants, which was pre-arranged with the help of the community liaison. Interviews with individual respondents lasted about 30 - 45 minutes on average, while focus group sessions lasted about 1.5-2 hours long. The wide range in length was due to the fact that some respondents were more detailed with their elaborations, whereas others offered more limited responses to the protocol questions. All the respondents completed the interview protocol and were given the opportunity to share any other unique experiences with the researcher. Most interviews were audio-recorded, as there were some participants who requested that they not be recorded. Manual notes were taken during these sessions with the participants. Interviews that were audio-recorded were also transcribed by the researcher. The community liaison also assisted with translating interviews that were conducted in the native languages of the respondents into Bahasa Malaysia, and these translations were later translated into English by the researcher.

3.6.3 Interview Protocol

All the interviews began with open-ended questions to allow the respondents to discuss their experiences. As the study was interested in the community members' intrinsic motivation to know, intrinsic motivation to achieve, and intrinsic motivation to experience stimulation during the learning and training sessions, the researcher referred to the self-

determination theory (SDT) literature to inform the questions to be asked with regards to these constructs. Several quantitative instruments that were frequently used to measure these constructs within the SDT research served as a reference to determine how to structure and word the qualitative interview questions. The instruments that were consulted include the Academic Motivation Scale, Intrinsic Motivation Inventory, and Basic Psychological Needs Scales. Aside from that, the researcher also consulted quantitative interview instruments investigating knowledge sharing behaviour (Huang, 2009; Xue et al., 2011; Oliviera et al., 2015). Items from these instruments were compiled and organised according to the constructs that were to be measured before developing the interview protocol.

In developing the interview protocol, questions were structured around the following constructs:

a. Project team
    1. Frequency of trainings conducted
    2. Development of training modules
    3. Implementation of the training modules
    4. Reception of the community members towards the training sessions
    5. Community motivation to work on the modules outside of training sessions
    6. Aspects to improve on or change for future modules
b. Community members
    1. Learning at the telecentre
        a. Expectations of the training
        b. How was the training conducted?

c. Satisfaction of the users with the way the training was conducted.

2. Knowledge sharing practices within the community
    a. What type of knowledge does the community share?
    b. How does the community usually share knowledge?
    c. What kind of knowledge does the community want to share?
3. Knowledge co-creation practices within the community

Questions were phrased based on the type of close-ended statements from the interview instruments. An example of this was taken from the Academic Motivation Scale (*[I study for my course]…for the intense feelings I experience when I am communicating my own ideas to others*) and rephrased as an open-ended question (*How does it feel to share your ideas with others?*) to gain insight on the respondents' feelings of being motivated to partake in knowledge sharing activities. Prompts were also generated to elicit further responses from the participants when necessary.

Testing of the interview instrument was also conducted, and two community members were invited to participate in the initial interview session with the researcher. Criteria for selecting both of the participants for the interview was that they were users of the telecentres, as well as community elders. The reason for this was because the main objective of the interview was to find out more about (i) the user experiences of the telecentre, (ii) indigenous ways of learning, and (iii) knowledge sharing and knowledge co-creation practices within the community. These interviews were conducted face-to-face during the initial visit to the research site. Interviews were personally transcribed by the researcher, and observer comments were added, noting emergent themes and prompts for further inquiry.

Several guiding questions were used during the interview with the community members. These guiding questions centred around the following aspects:

1. Processes involved during the establishment of the telecentre which involved the community members
2. Personal expectations of the telecentre
3. Personal evaluation of the training sessions at the telecentre
4. Motivation to use the telecentre
5. Learning criteria as prioritised by the community members
6. Knowledge sharing and knowledge co-creation practices within the community
7. Motivation to share knowledge and co-create knowledge at the telecentre

During the interviews with both the respondents, the researcher asked them to comment on questions that were not clear or needed extra explanations on. The respondents were also asked to provide feedback as to how the interview guide could be better improved for its use during the main interview sessions with respondents from all three sites. Both respondents completed the entire interview with the researcher, and commented that overall, the interview guide was easy to understand, but it might be good if the interviewer could explain certain terms such as knowledge preservation and learning within the community to the respondents, as they might not be sure what these terms meant.

Examples of selected questions and responses from the respondents are highlighted in Table 3.3:

Table 3.3: Selected questions and responses

Selected questions	Selected responses
How was the community involved when the project team wanted to build a telecentre here?	Before we built the building, we had a discussion. The team came in a few times to discuss with the Penghulu, Ketua Kampung, and us also. They told us what they wanted to do, and what are the benefits. And we really supported the telecentre because it was a facility for the community to connect to the world outside. It is really very important.
How was the training at the telecentre conducted?	Some people from UNIMAS would come here and they would teach us the basics. Things like email, how to write documents. It was like a class, they teach us what to do. After that, they will ask us to try to do it ourselves, and if we have any questions we can ask them.
What information do you usually share with the other community members? How is this done?	We share about things like, what is new. What needs to be decided upon. We will discuss till we have a decision. Because for the village, this is very important. It is important for us to sit together and share about everything. Even when outsiders want to come in, we will sit together and we will talk about what we want to do, what is the purpose of them coming.

Throughout the interview phase, the researcher conducted two focus groups with the respondents at the second site. These focus groups consisted of respondents who were community members and elders, who had some experience with the telecentres and the ICT literacy training, both as users and non-users. These respondents were also part of the community-led learning programme which was conducted at two of the research sites. During the focus groups, or group interviews, group interaction was used as part of the method during the data gathering process and relied on participants' discussion with one

another on their experiences and points of view. The participants were also encouraged to ask questions and comment on the topic being asked by the moderator, which was seen as a useful way for exploring the experiences and knowledge of people (Kitzinger, 1995). It was also observed that group discussions are useful when the researcher wants to "encourage participants to explore issues of importance to them, in their own vocabulary, generating their own questions and pursuing their own priorities" (Kitzinger, 1995).

During the focus group sessions, the researcher was not only able to collect interview data based on the interview guide but also had the chance to observe the group of community elders discussing and sharing information with one another. Throughout both the sessions, the researcher was able to witness first-hand the way the community held discussions with one another, the nuances used by the community to convey their thoughts and how the discussion grew because of the interaction that they had with one another. For example, a question relating to areas of interest that they would want to learn or know about during a training session at the telecentre led towards the community elder sharing more about the information that they had gathered from the medical officer at the community clinic. From this, the conversation then moved on to the tips that they received from their children before another elder started sharing about traditional medicines that her family elders used to use and where to get these remedies from in the jungle. The community members then started to discuss the different types of plants that could cure certain ailments. These were the types of exchanges that were observed and noted by the researcher to use as a guide when analysing knowledge sharing practices amongst the elders in the community during the focus group sessions.

3.6.4 Observations

Observations were conducted as a data collection instrument during this study in order to understand the knowledge sharing and knowledge co-creation practices of the community members when they were participating in the community-led learning programme. During these workshops, the participants were involved in two activities, namely beading and cooking traditional delicacies, both of which were conducted based on the instruction of the indigenous communities themselves. Interactions among the community members were also observed to further elicit information on the motivation to participate in knowledge sharing and knowledge co-creation when the respondents were participating in the learning activities organised at the telecentre. These observations were also used to corroborate the information obtained through the interviews with the respondents. A total of four face-to-face observation sessions were conducted at both the research sites in Bario and Ba'Kelalan. The observation data was collected over two workshops at each site, with the researcher watching the participants throughout the workshops. Notes were taken during these sessions to take down the interactions made between the participants, and video recordings were also taken. The researcher also rewatched the recordings to make further notes regarding the interactions that could have been missed during the workshop.

During the first round of interviews conducted with the community members, the researcher paid attention to the communications that the respondents had with one another during the focus group sessions, as well as their expressions during the personal interviews. Apart from that, as the researcher stayed at the research site for a minimum of four days each time a site visit was scheduled, the researcher was also able to observe the community outside of the interview sessions. These observation experiences also provided

the researcher with a deeper understanding of the community, and this helped the researcher during the data analysis stage of this study.

Participant observation was conducted when the participants were participating in the development of the community-led learning programme, through the documentation of field notes during the research data collection period. Notes were taken to record and detail the observations of how the participants interacted with each other when partaking in the programme's learning and teaching activities. This was to let the researcher gain an insight into how the members of the indigenous community shared knowledge with one another, as well as their processes when co-creating knowledge together. Apart from that, the observations also allowed the researcher to see first-hand the changes in motivation levels as the project progressed, giving the researcher valuable insight on this aspect.

3.6.5 Document Analysis

The researcher obtained documents pertaining to the project planning, pre-and post-implementation documents (Needs Analysis, templates, Evaluation reports, Training manuals), as well as final reports and replication reports from the project team. The team also furnished the researcher with publications of the project that were presented during conferences. These documents were useful in illuminating the discussion on the implementation of the ICT literacy training programme at the telecentre.

3.7 Data Collection Procedure

The following Figure 3.7 illustrates the procedure followed, from determining the research sites to gaining access to the sites and engaging with the community members.

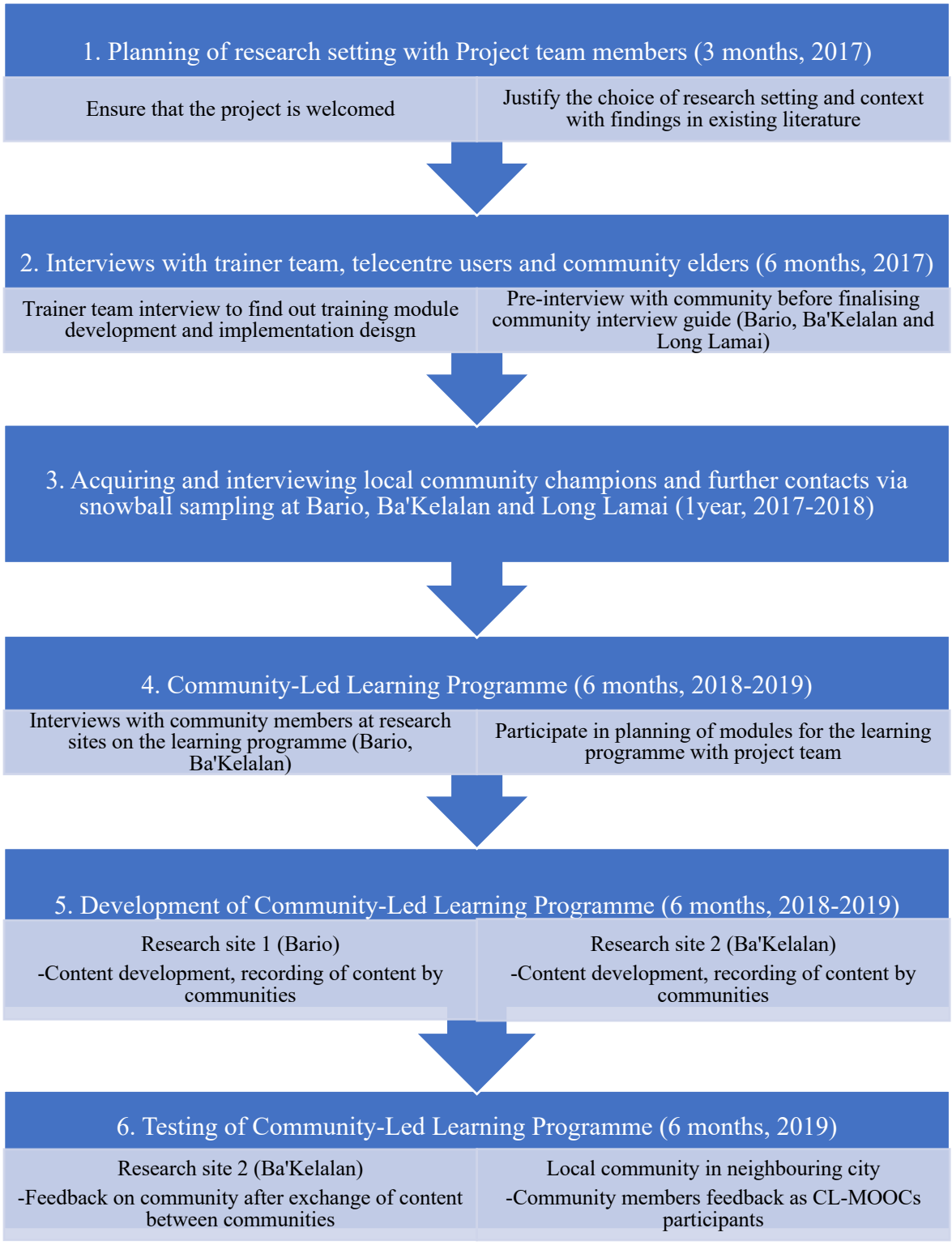

Figure 3.7: Data collection process flow

Data for this study was collected between 2017 to 2019 and was conducted in stages with all the respondents. The first pool of respondents consisted of project team members who were part of the telecentre initiatives at the three sites, and interviews with these members were conducted in 2017-2018. The project team members included the project manager, project site leaders as well the trainers who delivered the ICT literacy trainings at the telecentres.

First, the researcher approached the project leader of the telecentre projects and requested consent to collect documented data and to interview some of the members of the training team during the rollout of the telecentre programmes at the sites. Upon receiving approval to proceed with the initial data collection stage, the researcher then proceeded to contact some of the trainers and explained to them the objective of the research and the targeted respondents of the study. The trainers then provided the researcher with the necessary materials, which detailed the processes involved when designing the training modules for the telecentre managers and, subsequently, the community. An interview was also held with three of the trainers, who provided information on the training sessions conducted at the sites. Document data, such as project outline, needs analysis reports, feedback from participants during the training, final reports as well as module design and module outlines, procured from the team was then studied to determine the phases involved in the implementation of the ICT literacy training, and the instructional design methods used during the training sessions.

From this, the researcher was then able to proceed to the second step of data collection. Using the information from the documents and the interviews with the trainer team members, the researcher then proceeded with the initial stage of interviews with the

telecentre managers and users of the telecentre. Interviews with the community members were conducted over a two-year period, as the locations of each site were not easily accessible by the researcher. Due to the limited opportunities to enter the site, as well as to accommodate the schedule of the community members who could only participate in the interviews outside of the paddy planting, harvest period, and other community events, the researcher was only able to meet with the participants of each site several times a year. The researcher spent a minimum of four days to a maximum of ten days with the participants at each time. The first meeting with the community members involved community elders as well as telecentre managers, who acted as the key informants (Creswell, 2013) throughout the study. Respondents from the communities included both telecentre users and community elders residing at the research site, and the researcher explained the objectives of the research to all of the participants of the interviews who were willing to participate in the study. The researcher also emphasised to each respondent that their personal information will be kept confidential and that they can withdraw their participation in the interview and research at any time they wanted. The participants were also asked to sign a form indicating their consent to participate in the interview. The interview was conducted in two languages, namely English and Bahasa Malaysia. A local community member was used to explain questions and translate responses in the native language of each indigenous community. These interviews were carried out to get an initial insight into the telecentre projects and the communities who were involved in the early project.

These informants were sought based on their experience with the telecentre projects and were in an appropriate position to comment on (i) the design and delivery of the training modules; (ii) the impact of the telecentre on the community; and (iii) indigenous learning styles and practices within the community. The respondents were purposely

sampled based on the recommendations by both the project team members, who were also central informants during the discussions to determine the appropriate research sites for this study, as well as the community elders and telecentre managers.

During the initial stage of the study, the researcher first spent time with the community members in order to establish a relationship with the potential participants (Hennink et al., 2018). One of the reasons for going through this initial process was because of the observations made by Winschiers-Theophilus et al. (2015), who noted that indigenous communities tend to relate better with researchers when they make an effort to get to know and understand the community. Rather than immediately going into the community and conducting interviews with them, the researcher opted to build rapport with the community members first before slowly coming to focus on the interviews. Through this experience, the researcher was able to observe how the community interacted with one another and took part in collaborative activities together. Aside from that, the researcher was also able to identify the ways the community members shared information among themselves and with others outside of their circles, which then informed the data analysis stages of this study.

Subsequent visits into the research sites were then utilised for data collection, as the respondents were already familiar with the researcher and were more candid with their conversations. A total of five trips each were made to two research sites, whereas only a single trip was made to the third research site. Table 3.2 offers a breakdown of the amount of time spent at each community.

Table 3.4: Research trips into sites

Research site	Number of trips	Number of interviews conducted	Total number of participants interviewed	Dates of interviews	Total length of stay during data collection
Bario	Five	7	7	21-28/07/2017 10-17/02/2018 15-19/03/2018 27-31/03/18 8-15/07/18	29 days
Ba'Kelalan	Five	4 individual interviews, 2 focus groups	4 individual 13 focus group respondents	23-29/11/17 20-26/02/18 3-7/03/18 25-30/06/18 19-26/07/18	28 days
Long Lamai	One	6	6	20-28/05/18	8 days

During the subsequent phase of the study, the researcher used the feedback received from the three sites and referred to Young's ID-TABLET to explore if the usage of an indigenised instructional design approach, one which included the feedback from the respondents, would be more effective. These findings were then applied to the community-led learning programme that was carried out with the respondents from these sites, and the

data collected from this stage of the investigation was used to answer the research questions and objectives of this study.

3.8 Trustworthiness and Ethical Considerations

In order to improve the trustworthiness of the analysis, the researcher performed member checking with several of the respondents once the data analysis and preliminary set of findings for the first phase of data collection were completed. The researcher returned to two of the sites to talk with the respondents about the interpretation of the data and to gather their feedback on whether the analysis and the findings were in accordance with their meanings and experiences. The summary of the findings was explained to the community members, and they were asked to provide feedback on each theme and the extent to which it was representative of their experiences. Notes on their feedback were taken to be used during the refinement of the major themes and findings during the subsequent rounds of data analysis. As the researcher was unable to return to the third site, member checks were conducted through the telephone and were only done with the one respondent who was residing in Miri. Overall feedback from the respondents was generally positive, and the trustworthiness of the analysis was largely confirmed. Some of the respondents went on to explain their meanings in more detail to the researcher, and these responses were also noted to be used for refinement in the findings. An example of this was the usage of the term “significant learning”. Some respondents stated that they felt that all types of learning were significant; the only difference was that whether this learning would benefit them as an individual or as a community. For them, their priority would be learning that benefits the whole community, although it was also good for individuals to learn more things that are good for them.

Upon completion of the checks with the respondents, the researcher proceeded to revise and refine the initial analysis. Some of the refinements made included revision of the language of the findings and the inclusion of more sentences or paragraphs to better explain the meanings of the community members based on the feedback received. For example, the term “significant learning” was revised to “criteria for learning according to the community standards” to better reflect the meanings of the community.

Reliability of the themes constructed was achieved through member checking with the participants from the communities, as well as with experts in the area of ICT4D, who have worked with indigenous communities, in order to check the findings and interpretations of the interview data and observations. Through various meetings, the themes and sub-themes were broken down further and refined to best represent the information derived from the data. Apart from that, the researcher also returned to the raw data to ensure that the themes reflected the participant narratives.

All research conducted must follow certain standards of ethics, and Resnik (2020) describes research ethics as standards for conduct that differentiate between suitable and unacceptable behaviour. Similarly, the current study undertaken followed the recommended ethical considerations when conducting research with communities. Given the uniqueness of this study, in that the research involved indigenous communities located in remote, rural Sarawak that have been part of telecentre projects, the anonymity of the sites was difficult to achieve. However, the researcher made efforts to ensure the anonymity of all respondents participating in the study were protected. Throughout the duration of this study, the researcher ensured all participants that they would be given autonomy to participate in the study or vice versa. The researcher also explained to them

that they would voluntarily be participating in the study and that this study would not carry any monetary gain to the participant. As potential participants, they could choose to either take part in the study or not. They were also assured that they would be able to stop participation in the study at any stage of the interview process without having to give any reason. The participants were also asked to complete an Informed Consent Form (Appendix 6), and for participants who were illiterate, they were asked verbal consent to participate in the study.

All the participants were informed that they would be kept anonymous during the reporting of the data and would be assigned codes in lieu of their names.

Table 3.5: Coding convention

Location	**Assigned code**	**Role**	**Assigned code**
Telecentre 1	BA	**T**elecentre **M**anager	Tm
Telecentre 2	BK	**Us**er	US
Telecentre 3	LM	**S**econdary **Us**er	Sus
Miri	MY	**C**ommunity **E**lder	Ce
University	U	**V**illage **H**ead	Vh
		Trainer	Tr
		Project **M**anager	PM
		Focus **G**roup	FG
		Pilot **S**tudy **P**articipant	PSP

3.9 Data Analysis

After collecting the interview data, the next step taken by the researcher was to analyse the data. Data analysis began with the researcher writing observation notes after each interview, which documented initial impressions of the responses and any significant ideas that emerged during the interview. Through this process, the researcher started identifying preliminary themes and patterns to guide the researcher through the other interviews. These initial observations also aided the researcher to pay more attention to similar themes that emerged during the interview sessions with the subsequent respondents and allowed the researcher to identify any new and distinct information. The process of making these observation notes also allowed the researcher to make sense of the content and recognise when data saturation was reached. Once this was achieved, the researcher then proceeded to analyse the data using thematic analysis.

3.9.1 Thematic Analysis

Characterised as a qualitative research method that can be extensively used across a scope of epistemologies and research questions (Nowell et al., 2017), thematic analysis is a method for identifying, analysing, organising, describing, and reporting themes found within a data set (Braun & Clarke, 2006). Although researchers have maintained that thematic analysis is a tool to be used to assist researchers in analysis (Ryan & Bernard, 2000; Holloway & Todres, 2003), Braun and Clarke (2006) postulate that thematic analysis should be a introductory method for qualitative analysis, as it offers core skills for running many other forms of qualitative analysis (Braun & Clarke, 2006). Thematic analysis was chosen as the method of data analysis in the study because of its highly flexible nature that could be utilised to suit the needs of the study, and could provide a rich and detailed, yet complex account of the data (Nowell et al., 2017). Braun and Clarke (2006) and King

(2004) also postulate that thematic analysis is a useful approach to examine the different perspectives of the participants, highlighting the similarities and differences that would lead towards the discovery of unexpected insights. By using thematic analysis in the present study, the researcher was able to discern the different perspectives from the three main indigenous communities with regards to traditional learning methods and their knowledge sharing and knowledge co-creation practices. The researcher was also able to identify their primary concerns and insights on learning at the telecentre, and could piece together the components that were important to them with regards to how the indigenous communities teach and learn effectively using their own ways of learning.

There are six phases of thematic analysis, namely (i) familiarising yourself with your data, (ii) generating initial codes, (iii) searching for themes, (iv) reviewing themes, (v) defining and naming themes, and (vi) producing the report (Nowell et al., 2017). The thematic analysis for this study was also conducted according to these six phases.

Examples of the themes and transcript excerpts used in the thematic coding are tabled below:

Table 3.6: Sample of three data extracts and codes generated

Sample data extract	**Code generated**
"It was meaningful because I learnt how to do things I didn't know before. But as I said earlier, when we don't have someone to ask or refer to on the spot, we can forget what we want to ask or do. So in the end, we don't do anything about it"	- Learning at the telecentre - Challenges faced
"Maybe if we have extra sessions with more people, or if we can have discussions"	- Sharing knowledge after training
"We must learn good things, things that will make us better people. Learning is only good if we can use it for good things"	- Significant learning

An example of the initial diagramming of themes during the data analysis stage is presented below:

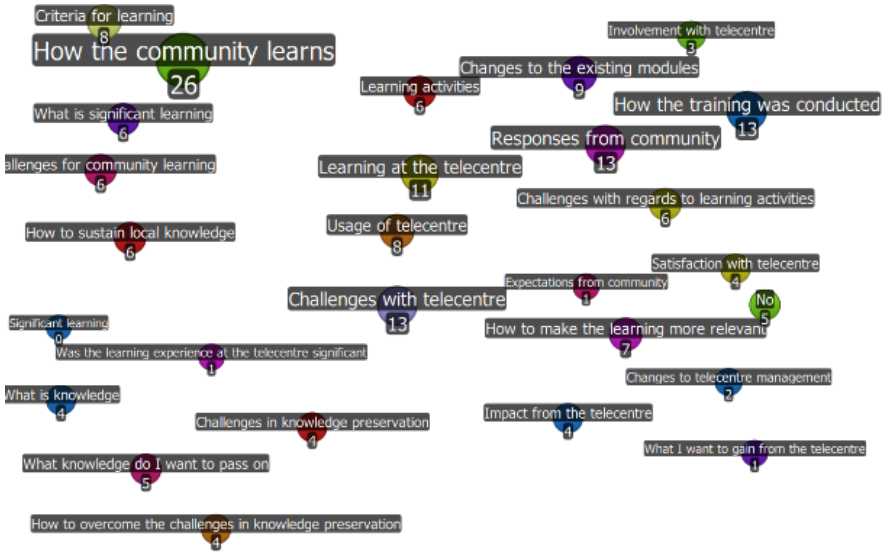

Figure 3.8: Initial diagramming of themes

3.9.2 Document Data

The document data obtained for the present study was first processed to organise the information into categories that were related to the research questions in this study. All content that was relevant and meaningful for the study was identified, reviewed and further categorised so that the information could be used to further inform and confirm information gathered from the interviews.

3.9.3 Observation Data

Field notes were gathered during the participant observations to document the process and sessions. These notes, together with the descriptions made by the researcher during the observations, were described in further detail during the documentation of the

comprehensive field notes and were then organised into categories and themes that would further inform and confirm the information gained from the interviews.

3.9.4 Data Triangulation

Critics of qualitative methods have argued that qualitative research lacks the scientific rigour that quantitative methods can give to a study; however, advocates of qualitative research have rejected this assumption as they state that the scientific rigour in qualitative research can be found through the conduct of a systematic and reflective process. It is fundamental that study outcomes are held as 'valid' and supported by evidence (Maxwell, 2012; Patton, 2015).

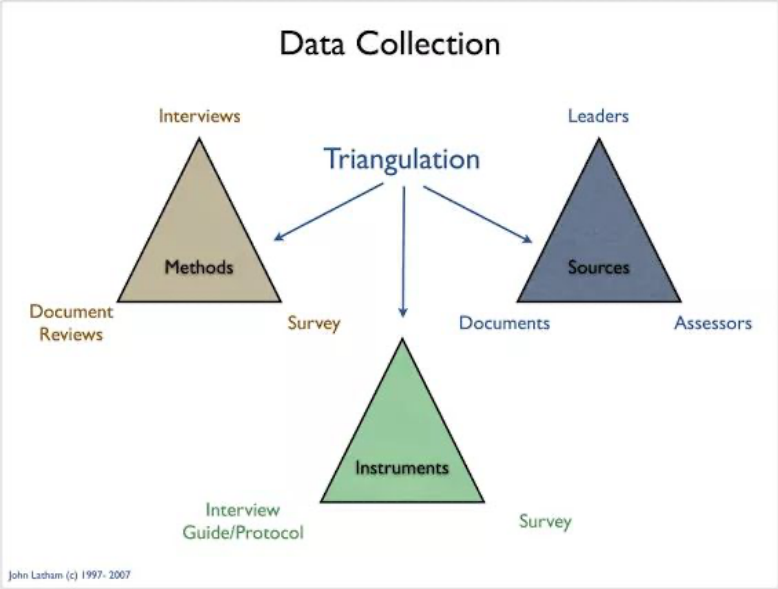

Figure 3.9: Data triangulation process

In this study, the researcher relied on triangulation to achieve this. The objective of triangulations is to obtain insights about the same phenomena from different perspectives to make an informed notion of its complexity. Triangulation also elicits richer data and access to the views of a broader and more diverse set of individuals involved in the topic

under investigation (Lennie, 2006). Examples of triangulation include (1) methodological triangulation, which is the use of multiple qualitative and/or quantitative methods; (2) data triangulation, whereby researchers use different sources of information to increase the validity of a study; (3) theory triangulation, or the use of multiple perspectives to interpret a single set of data; and (4) investigator triangulation which involves using several different investigators in the analysis process (Denzin, 1970, in Fusch et al., 2018; Krefting, 1991).

In the present study, triangulation was achieved through the use of interview data, observation, member-checking, as well as document data, and external documents. By using these methods of triangulation, the research was able to access the broader views and perspectives of the respondents, while fulfilling the necessary rigour needed for reliability of the research.

3.9.4.1 Interviews

Several different interview guides were used throughout the data collection, which were used for different groups of respondents. Participant interviews offered a range of views and revealed the dynamics of knowledge sharing and knowledge co-creation among indigenous community members. Information gained from the interviews were first transcribed, before being coded and organised into themes during the data analysis stage. All notes and elucidations from the interviews were also cross-checked using member checking with the participants in order to ensure that the interpretations made were as accurate as possible to the meanings conveyed.

3.9.4.2 Observations

Observations were made during several workshops conducted with the participants at two of the research sites during the rolling out of the community-led learning programme. These observations were conducted by the researcher, who made notes and video recordings of the interactions and communications made by the participants during the workshop. These observations were useful in terms of understanding the nuances and ways that the community learned and shared knowledge with one another, as well as the ways the community co-created knowledge with each other. The observations also provided the researcher with valuable insight on how these interactions form the ways of how the community learns, informing in greater detail on indigenous ways of learning, aside from what was informed during the interviews.

3.9.4.3 Document Data

Document data provided examples of project planning, training modules, and training design and reflected the actual practices when initiating learning activities at the telecentre. Whenever possible, the information gained from document data was used to corroborate information from the interviews and observations. An example of this was when the trainer teams informed the research team that there were no specific assessments that took local ways of learning and assessments into consideration when they were developing the modules for the ICT training. Module outlines obtained from the trainer team corroborated the statements made by the trainer team here.

The researcher also relied on external documents such as publications by the trainer teams regarding the ICT training sessions at the three telecentre sites as well as on the community-led learning programme conducted at two of the research sites. These

publications allowed the researcher to corroborate information regarding the instructional design used during the ICT training sessions at the telecentre as well as the details of the community-led learning programme organised at the research sites with the other data obtained through interviews, document data and observations.

3.10 Summary

In sum, this chapter sought to explain the choice of the methodology used in this research, with justifications for the approach and processes involved during the data collection and data analysis phases.

CHAPTER 4

DATA FINDINGS

4.1 Introduction

The data collection journey was conducted over a period of two years, spanning several phases of interviews conducted with the team of trainers from the project team and community members from the research sites. The initial stage of data collection was conducted with communities from three established telecentre sites in Bario, Ba'Kelalan, and Long Lamai. Information gathered during this stage was used to build on guidelines and criteria informing an indigenised instructional design which could be used to strengthen the motivation to share knowledge and co-create knowledge among indigenous community members. From this, a second stage of data collection was conducted with respondents from two research sites in Bario and Ba'Kelalan, who were participants of a community-led learning activity designed for communities. The main branches of data analysed are the interviews with the trainers from the project team, community members at all three telecentre research sites, interviews and observations of the participants in the subsequent stage of the data collection, and document data obtained from the project team. Findings of the data will be reported according to the phases of data collection.

4.2 Data Analysis Process

The data collected was analysed in several stages, the first being the researcher getting familiarised with the data. The interview sessions were transcribed by the researcher, and notes were added to the initial observation notes made during the interview. The transcriptions and observation notes were documented using Microsoft

Word, and the data was named according to the coding convention assigned to the respondents.

Once the initial familiarisation with the collected data was complete, the researcher then proceeded to generate the initial codes of the data. An overall observation of the data was conducted by the researcher, and the initial production of codes were done according to the themes that first emerged. In the case of the interviews with the trainers, the first interview was first observed and the most frequent themes to emerge at this stage were used as a base guide for the further categorization of the codes from the other interviews. Following this, individual extracts of data were coded into the themes as they fit, and as many times necessary.

Table 4.1: Transcription of data

Selected questions	Selected responses	Observation notes made during interview
How was the community involved when the project team wanted to build a telecentre here?	Before we built the building, we had a discussion. The team came in a few times to discuss with the Penghulu, Ketua Kampung, and us also. They told us what they wanted to do and what are the benefits. And we really supported the telecentre because it was a facility for the community to connect to the world outside. It is really very important.	Respondent was very animated when describing the setup of the telecentre. Excitement when talking about how the telecentre changed their lives, and what they wanted to achieve.

Table 4.1 Continued

How was the training at the telecentre conducted?	Some people from UNIMAS would come here, and they would teach us the basics. Things like email, how to write documents. It was like a class; they teach us what to do. After that, they will ask us to try to do it ourselves, and if we have any questions, we can ask them.	Respondent did not seem very enthusiastic about the training programme. When probed further, respondent shrugged and answered nonchalantly. Seems indicative that respondent was not very enthusiastic, but was satisfied with how things were going.
What information do you usually share with the other community members? How is this done?	We share about things like what is new. What needs to be decided upon. We will discuss till we have a decision. Because for the village, this is very important. It is important for us to sit together and share about everything. Even when outsiders want to come in, we will sit together, and we will talk about what we want to do, what is the purpose of them coming.	Descriptive when talking about how the community shared knowledge with one another. Emphasised repeatedly on how important it is for the community members to sit and DISCUSS with one another. Communication and interaction is key towards how they share knowledge and information.

The initial codes developed for the responses are highlighted in the table below:

Table 4.2: Design factors in the Elements component

Sample data extract	Code generated
How we learn is when we don't know something, we will ask. We will go to the experts in the community and ask how to do something, and they will share their knowledge with us. It is all based on our own efforts and how much we want to learn. And how much efforts we put in to master it.	• Ways of learning within a community • Interest in learning • Motivation to learn • Transmission of knowledge from elders

Table 4.2 Continued

We want to keep our knowledge for our children. If people take videos of us, or we can learn how to make these videos, it would be good	• Community knowledge preservation • Usage of ICTs for knowledge transmission
Yes, if we can be trainers ourselves we would want to do that. I am sure we can teach others if it is about our lives, or something that we are good at.	• Interest in content creation • Motivation for knowledge sharing
Our customs and traditions, that is very important. So that the younger generation does not forget what we already have in existence. We should make videos on our knowledge, the conditions of our surroundings, actually there is a lot that we need to make.	• Community knowledge preservation • Usage of ICTs for knowledge transmission • Motivation for knowledge sharing

With the listing of different codes across the data set, the subthemes in the codes were then identified. The researcher proceeded to make diagrams of the themes in order to make sense of the connections between the themes. The emergent themes were then reviewed, and refined in order to understand and develop a coherent flow of the patterns formed from the data. During this phase, the researcher also made several changes to the initial coding in order to better reflect the emergent themes from the collected data. From this, the themes were further defined and details identifying the nature of the themes and how the themes were reflective of the narrative of the thesis were determined. Subsequently, each of the themes were related to the research questions, and were named accordingly in order to reflect the areas addressed. Quotes from the respondents were also chosen to reflect the meanings conveyed, as well as to assist with the understanding of the specific points of interpretation. The final member checking with most of the respondents

was not able to be conducted due to restrictions in travel, however, whenever possible, the researcher sought to communicate with some respondents through mobile messaging and voice messages before the final thesis was produced.

4.3 Phase One: Design and Implementation of Training Modules at the Sites

An objective of the eBario project, and subsequently the eLamai and eBakelalan projects, was to encourage capacity building among the community members. In order to achieve this objective, the researchers had to develop a series of training modules for both the identified local champions as well as members of the community on various topics that had been identified from the needs analysis process conducted with the community members.

In line with the objectives of bridging the digital divide, the focus of the training was on ICT literacy, and modules were developed to introduce the community to the basics of ICTs, which included basic functions of the new technologies. Trainings were conducted a month before the launching of the telecentre and were carried out several times to ensure that members of the community continued to familiarise themselves with the technologies and their related services.

In order to understand where the design of the initial rollout of the telecentre and the trainings conducted at the telecentre stood in terms of strengthening motivation to share knowledge and co-create knowledge among the indigenous communities, the researcher sought to conduct interviews with trainers who were involved in the training sessions at the telecentre, as well as to obtain document data from the research team that initiated the telecentre projects at the three research sites. The findings of this stage of inquiry aimed at answering the first research question posed in the current study, namely to what extent did

the current instructional design model used at the telecentre motivate knowledge sharing and knowledge co-creation among the community members.

4.3.1 Interviews with the Trainers

While there were many trainers identified who were involved in the rollout of the training programmes at the telecentres, only a total of three trainers agreed to participate in the research. The reason for this was because many of the trainers were no longer with the university and could not be contacted. A few said that they could not recall much of the training sessions and were worried that they could not provide much information about the training. The three trainers who participated included researchers who had published papers about their experience with training the community members and the team member who coordinated the training sessions of the telecentre project. The interviews with the trainer team were done both through face-to-face interviews and online platforms, as there was one trainer that was no longer with the research institute and could only be contacted online. Artefacts including the training modules, training implementation plan, project reports and published papers by the research team were also collected.

From the interviews, it was found that the trainings were designed by the team prior to the implementation of the trainings and were developed based on the needs analysis interviews conducted with the community members who were asked about their interests and expectations with regards to ICTs and the telecentre. However, the respondents also made some salient observations on their experiences as trainers with the community members, especially in terms of the content, the design of the modules and literacy levels of the community members themselves.

Table 4.3: Observation I

Observations	Selected responses
There is a need to learn more about the literacy and competency skills of the community members involved	***TR1****: I think we should have done more groundwork in finding out their competency levels first, or what they were more interested in doing. When we got to the ground, we found out that there were a few people who couldn't read but the module was about writing a letter!* ***TR2****: We went in with our modules, thinking that we just needed to deliver the modules to the participants. However, we realised that we had overestimated their skills. It was partly my own fault, for not getting a deeper understanding on their competency levels before going in to conduct the training with them.*
Content has to be tailored to suit their needs and interests	***TR3:*** *"I honestly think that we should study their needs and offer courses that they want to do, instead of what we think they should know. They should be the ones to choose what they want to do."*
Design of the modules needs to be more community-centric	***TR2****: "The community members took the effort to change the language for the modules so that everyone could understand the content."*

These observations shed insight on the importance of considering community interests and incorporating a more community-centric approach towards the design, delivery and implementation of the learning activities at the telecentres.

4.3.2 Document Data

Document data was obtained from the project team for the purpose of identifying how the development of the content and what instructional design was used for the

modules that were to be introduced to the community members. The project team furnished the researcher with the project outline, needs analysis reports, feedback from participants during the training, final reports as well as module design and module outlines. The proposed training schedules of the trainer teams were also given to the researcher, in order to ascertain the frequency of each training as well as how long the training sessions were anticipated to take.

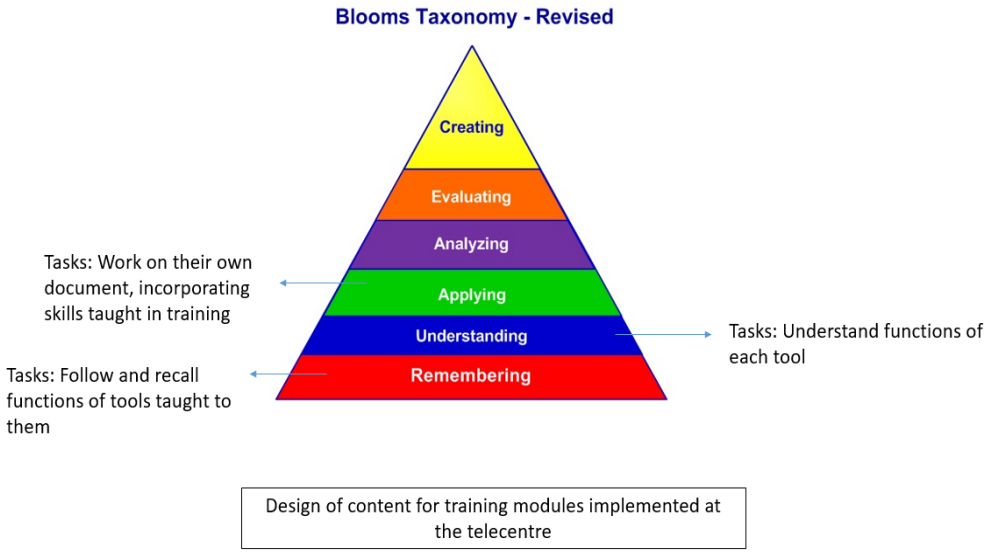

Figure 4.1: Framework for design

The modules were designed using the revised Bloom's Taxonomy, and had an emphasis on the three domains of the taxonomy: Cognitive, Affective, and Psychomotor. The tasks were designed based on the lower three levels of the Bloom's Taxonomy and the implementation of the training modules also took on the following strategy for delivery:

Table 4.4: Delivery strategy for ICT literacy training and assessment

Strategy	Evaluation
• Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore	• Pre-test • Post-test

Mit, Juan, Jali, & Lee (2010) also reported that the team used the Performance Prism framework in the design and delivery of the training programme to the community, which takes into account the "needs of the local communities, the capabilities of the stakeholders in providing or attending the training, and also the strategies needed to conduct the training".

The instructional design model used at the telecentre was based on the ADDIE (Analysis, Design, Develop, Implement and Evaluate) model (Juan, Jali, Mit, & Phoa, 2010). An example of the module content which was developed for the training at the telecentre is as follows:

Table 4.5: Example of module content

No	Module	Learning outcome	Contents	Strategy / Evaluation
1	Internet Browsing using Mozilla Firefox	After completion of the module, communities should be able to: Know how to start and close the web browser, Firefox Follow the step-by-step procedures on how to view the websites	Starting and closing web browser, Firefox Viewing webs (i.e. youtube, *berita harian*, *resipi.net*, *portal pendidikan*, etc)	Strategy: • Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore Evaluation: • Pre & Post tests
2	Email (*www.gmail.com*)	After completion of the module, communities should be able to : • Create email account using Gmail. • Compose and send emails to friends and relatives. • Communicate online with friends and relatives using 'Chat' in Gmail.	• Sign up for a new email account • Login to email Email start up: Main page Read an email Reply an email Delete an email Delete emails from Trash Bin Send an email • Chatting using 'Chat' in Gmail Receiving and sending file using attachment	Strategy: • Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore Evaluation: Pre & Post tests

Table 4.5 Continued

2	OpenOffice.org: Writer	After completion of the module, the community should be able to: • Know how to open, create, save and close documents and understand how documents are presented on the screen. **(*Cognitive – C1-Knowledge)*** • Select and work with text in a document. **(*Cognitive – C1-Knowledge)*** • Format text in a document and work with all the application. **(*Pshychomotor-P3-Guided Response*)** • Understand and use various Writer settings. **(*Cognitive – C1-Knowledge)*** • Access and use the help system and work safely with the computer**.** • Work on their own document, incorporating all the techniques of content manipulation that is taught during the training. **(*Affective-A3-Valuing)***	The Basic of the OpenOffice.org Writer Creating, Saving, Opening and Closing files Using the Insertion Point and Entering Text	Strategy: • Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore Evaluation: Pre & Post tests

(Source: DAGS final report)

Interview data collected from the trainer team highlighted the following, and the information derived from the interviews were also supported by the document data provided by the trainers, as well as the publications produced by the team.

Table 4.6: Sources of data

Interview data	Document data	Publication data
TR1: We were given the modules by the project team, and delivered the content based on the learning objectives and goals that we wanted to achieve. Delivery of the content was done the same way we conduct other trainings, we did not specifically use any community approach to the training sessions.	Examples of modules that highlight the design of the content material (DAGS final report)	The instructional design model used at the telecentre was based on the ADDIE (Analysis, Design, Develop, Implement and Evaluate) model (Juan, Jali, Mit, & Phoa, 2010).
TR3: Our assessements for the sessions were mainly pre and post tests. The pre-tests were done to see if they knew the material or content before our training, then we would ask them how they found the training, if they learnt anything new and useful to them.	Assessment strategy (ICT Training module plan)	(Mit, Juan, Jali, & Lee, 2010)

From the interviews with the team of trainers, it was seen that the respondents had similar experiences and observations throughout their training sessions with the different communities. Many of the responses focused around the implementation of the training modules, the reception of the community members towards the training sessions and the changes that they would have liked to see being implemented in order to further improve the delivery of future modules.

The information gained from the interviews were also corroborated with both the document data and publication data regarding the ICT training sessions conducted at the telecentre sites. All three data sources showed that the main instructional design model used at the three sites were based on the ADDIE model, and that there were no culture specific ways of assessments conducted at the sites.

4.3.3 Interview with Community Members

In this stage of the inquiry, interviews were conducted with telecentre managers, users and non-users of the telecentre, as well as community elders at each of the research sites. A total of 28 respondents were interviewed at the three sites and included both individual interviews as well as focus group sessions with respondents. Interviews were conducted around the following constructs: (i) user experiences at the telecentre, (ii) learning within the community, (iii) respondent motivation, and (iv) community priorities. Further inquiries were also made on their perceptions towards the training sessions and their opinions on what other improvements could be made to the training sessions to strengthen their motivation to engage in knowledge sharing, knowledge co-creation and knowledge preservation activities.

The method of analysis followed the six phases of thematic analysis, namely (i) familiarizing yourself with your data, (ii) generating initial codes, (iii) searching for themes, (iv) reviewing themes, (v) defining and naming themes, and (vi) producing the report (Nowell et al., 2017), as indicated in Chapter Three. The questions that were asked during this stage of inquiry take on a similar tone to the guiding questions recommended by Young (2009), as the inquiry areas were related to culture. The identified areas of

culture in the inquiry are (i) cultural artefacts, (ii) cultural history, and (iii) cultural knowledge.

Several parts of inquiry were conducted during this phase; firstly, the users' experiences were investigated to gain insight into the training conducted at the telecentre according to the community members and users' perspectives. By exploring this, the researcher understood their perceptions and what they hoped to see differently conducted at the telecentre. Secondly, the participants were asked about the ways of learning within the community to differentiate their cultural practices and compare the ways that they are accustomed to and how the training was delivered at the telecentre. The reason for doing this is to investigate if these differences affected or contributed to their learning experiences at the telecentre. During this part of the inquiry, the participants were also asked about their knowledge sharing and knowledge co-creation practices within the community. During this phase of inquiry, the researcher aimed to answer the first research question of the current study, which was to what extent did the current instructional design model used at the telecentre motivate knowledge sharing and knowledge co-creation among the community members. In order to understand if an indigenised instructional design was used when designing learning programmes at the telecentre in order to motivate knowledge sharing and knowledge co-creation among the indigenous community members, the researcher proceeded to ask them questions related to using community ways of learning and their perceptions on using ways of learning that the community were accustomed to when participating in learning activities. Questions related to their own priorities and interests were also asked during this phase of inquiry, and further investigation into this aspect also led to insight on how this motivation can be strengthened when considering what the community prioritises and how this fits in with an indigenised

instructional model. The researcher hoped that by exploring these areas of inquiry, the second research question governing the study would be answered. Finally, the third aspect of the investigation looked at the community members' motivation to use the telecentre and participate in knowledge sharing and knowledge co-creation activities there, as well as the role that they saw the telecentre taking on to support their learning needs as well as knowledge sharing and knowledge co-creation practices, which would answer the third research question of this study.

Similar to what was done with the interviews conducted with the trainer team, the method of analysis for these interviews first started with the familiarisation of the data. Interviews from all the three sites were first transcribed by the researcher, and documented using Word. The transcriptions also included side notes of the observations made by the researcher during the interview sessions and the focus group sessions, which aided in the generation of the initial codes for this phase of interviews. The initial codes generated for the interviews were similar across the board, as the community members expressed similar ideas, feelings and perceptions of their experiences and non-experiences with the telecentre and the training sessions that were conducted there.

4.3.3.1 User/Learner Experiences at the Telecentre

The respondents were asked about their user and learner experiences at the telecentre, which included their expectations of the training, how the training was conducted and their satisfaction with the way the training was conducted.

With regards to their expectations of the telecentre when it was first established, their responses were positive, stating that they were excited about the telecentre as they anticipated that it would bring development into their community and raise them to the

levels of the urbanites. They were also personally invested in the telecentre, especially in terms of learning about ICTs and what it can do for the community. Respondents from Ba'Kelalan also stated that they would often find time to go there and were proud to have the telecentre in their village as it showed that they were moving forward by bringing in ICTs into their village.

Table 4.7: Selected responses 1

Selected responses	Selected codes generated
*BA US 3: We are all **eager to learn**, and we want to have this technology in our village as well. We **can learn anything if we have the opportunity**.*	• Interest in learning • Motivation to learn
***BK Vh 1**: Initially they **all excited** with the programme, after school they would go there. There were kids who lived nearby who went. Even the ones here would go there when they had time. At that time, it was okay.*	• Motivation to learn • Interest in the telecentre
***LL Ce 1:** We were **excited** because this is a new thing for us.*	• Interest in the telecentre
***LL US 4:** I felt happy, because it is a good thing for the village. Because before the telecentre, we could only write using paper, and it took a lot of time to send it out. Now, with the telecentre, we can send news out using email. So for me, I felt that it was a good thing.*	• Motivation to use the telecentre • Interest in the telecentre

However, some respondents from Ba'Kelalan shared that their enthusiasm for the telecentre and the learning programmes conducted there waned over time. Further investigation revealed that the community was not very keen on programmes that followed a more formal education format, as this was not something that they were interested in. Other responses included that the elders in the community were not as enthusiastic about using the telecentre and were not interested in the promises that ICTs and the Internet brought, which explained the lukewarm responses received.

Table 4.8: Selected responses 2

Selected responses	Selected codes generated
BK US 2: *I felt proud. That means that it was up to my expectations. Then after that, it started getting slow. Community experiences, with their interest for formal education, is not really there. Not that popular.*	• Ways the **community learns** • Low interest in **formal learning methods**
BK US 1: *As I expected and thought, the response was lukewarm because most of the people who live here are old, so their enthusiasm to use the Internet is not there.*	• Need to cater to **needs and interests** of elders

Responses from Long Lamai showed that the community members were disappointed when the telecentre ceased to function, and expressed a strong sense of loss without the telecentre. During the interview sessions, a number of the respondents expressively indicated that the telecentre was indeed an integral part of their lives, and a source of motivation for them to learn and achieve more for themselves and for the community. Although one of the main setbacks from not having a telecentre was due to communication gaps between them and the societies outside of their village, another observation made is that they lost a sense of togetherness and a motivating factor to get together and work collectively to learn something new.

Table 4.9: Selected responses 3

Selected responses	Selected codes generated
LL US 2*: After that, they brought it in and we saw and* ***felt what it was like to have it****. We were very attracted to the facility since the beginning,* ***but now, it is no longer functioning****. All my hopes were achieved. But after that,* ***when the telecentre was no longer functioning, I felt that Long Lamai also fell****. It stopped raising. I also feel it still, and keep asking when will we have it again. There is a difference. When we had it, it was convenient for us to contact people and to have more people coming here. But after it is no longer here, it is difficult to contact.* ***We have lost contact****.*	• **Sense of loss** without telecentre • **Motivation** to use the telecentre • **Communication** with people

Table 4.9 Continued

***LL US 5**: **We have lost that communication point**. We **used to sit together and discuss at the telecentre, but now, we are all on our own**. We no longer have the opportunity to use the PC, those who have mobile devices then okay. But **our kids no longer have the chance to learn**. This is one thing we feel is lost.*	• **Community learning** • **Sharing of knowledge** • **Communication among community members**

The comments from the respondents suggest that the community members were very motivated to use the telecentre, and felt they had gained a lot from their experiences there. These experiences were seen as an important part of their lives and they expressed a sense of disappointment when the telecentre ceased to operate.

i. Training and instructional design used at the telecentre

The users were also asked about their experiences with the training sessions at the telecentre and how it was implemented. The users' responses corroborated with the trainer team's answers in that the trainers from the project team would come in and train them over several days. The training content primarily focused on ICT literacy, and there were also train-the-trainer sessions for the community members to become community trainers. As for the instructional design used during the training sessions, the community members only commented that a trainer taught them, and they followed the training before exploring on their own. They could ask questions if they needed further clarification, but there were no other activities conducted after the sessions, both with the trainers or among themselves.

Table 4.10: Selected responses 4

Selected responses	Selected codes generated
BA US 3: *People from (Project Team) came in many times, from the beginning till it was completed. They came a few times to teach us things like Google, email and word documents.*	• Instructional design practiced • ICT training session
BA US 3*: They would* ***explain*** *what is the training about,* ***then show us how to do****. Then we will* ***try to do it ourselves****, and if we had any question, they will explain to us again. Then we needed to do it ourselves so that we can* ***make sure we can teach the community members*** *next time.*	• ICT training session • Instructional design • Satisfaction with trainings
BA US 2: *We will* ***attend the workshop,*** *then after that, we will go back, and* ***if we need to use it, we will go and do****.*	• Learning experiences • ICT training session
LL US 5*: From those who came to teach us, from UNIMAS. I don't remember how many times they came, but they used to come in quite often, and each time they came, they would teach us.*	• ICT training session • Frequency of trainings
LL US 6*: Learning activities at the telecentre…* ***when they had training, we would learn****.*	• ICT training session • Learning experiences

Some responses from Bario and Long Lamai showed that they did not really remember much of the training, as they had little or no opportunity to practice what they learned. They also mentioned that they did not remember much of the training content because it was not something that they would need to do on a daily basis or was part of their lives.

Table 4.11: Selected responses 5

Selected responses	Selected codes generated
BA US 4: *I remember how to turn the computer on, but I don't know how to write documents anymore.*	Insignificant learning experiences
BA US 5: *We were taught how to use the computer, how to use email****. I don't remember anything else aside from that.***	Insignificant learning experiences

Table 4.11 Continued

LL US 4*: People from UNIMAS. They came in many times. They would teach us different topics every time they came in. Then they would ask us* ***what we want to learn****, and they would teach us. There were trainings done in Long Lamai. Trainings like… I don't remember much… things like how to arrange files, use Word. There were a lot.*	• Instructional design used Insignificant learning experiences

Respondents from Ba'Kelalan shared that the training was conducted in a classroom setting, whereby the trainers would teach them and try to do the tasks assigned to them after the training. The trainers would also answer any questions that they had, especially when trying out new modules. Similar to the first site, the community members were also asked to participate in the train-the-trainer programme. Several users stated that they participated in the programme; however, the community's response was lukewarm.

Table 4.12: Selected responses 6

Selected responses	Selected codes generated
BK TM 1*: Last time, we did conduct them.* ***We did plan for it, but the response was slow****. So what we did was to have individual classes. Whoever is interested to learn the basics, come, and we will teach.*	• Disinterest in trainings • Changes in instructional design practiced • ICT training sessions
BK US 1*: We* ***offered classes****, but yet,* ***nobody came****.*	• Disinterest in trainings • Demotivation for ICT trainings

However, the community trainers' training was slightly different from what was conducted by the project team trainers, in that the community trainers mostly gave one-to-one training compared to a classroom setting. They also did not use any slides or any teaching materials but rather taught the community members directly.

Table 4.13: Selected responses 7

Selected responses	Selected codes generated
BK US 2: *There were no learning activities held there, only that we taught them directly and individually.*	• Changes in instructional design practiced • Learning experiences
BK TM 1*: We don't use slides or anything; they use the computer immediately. I think that they learn faster and better that way, rather than sitting and learning from slides. They learn faster by doing practical work instead of learning theory.*	• Changes in instructional design practiced • Content of training
BK US 1: *We taught them practical immediately, no slides. Immediately taught them how to click, how to use the keyboard. Like that.*	• Changes in instructional design practiced

The change in the delivery method here is akin to what was found during the data collection with the first site. It was observed that they learn best through hands-on exercises that involved an elder (in this case, a trainer) and the younger member (here, the telecentre user) in a personal environment instead of a structured classroom or lecture setting. The trainer also mentioned that they used examples that were easier for the users to understand and contextualised the content for the community members to make more sense to them. The observation made here further reinforces the importance of incorporating community perspectives and involving community members in the planning and execution of training and learning activities at the telecentre. Again, there was no mention of conducting learning activities outside of the scheduled training sessions initiated by the community members themselves.

Respondents in Long Lamai also shared that the community members would conduct some of the trainings, as they had been selected to act as community trainers by the UNIMAS team.

Table 4.14: Selected responses 8

Selected responses	Selected codes generated
LL US 4*: Yes, it (the training) was by the community. There would also be people from UNIMAS to teach when they were around. Maybe about 4 hours a session. And they would be there for about 3 to 4 days.* ***They would even teach us at night****, when they are at the homestays.*	• Instructional design practiced • Learning outside • Community learning practices

ii. Satisfaction with the training and the telecentre

In terms of their satisfaction with the training and the telecentre, the respondents stated that they were generally satisfied, as was indicated in the responses below.

Table 4.15: Selected responses 9

Selected responses	Selected codes generated
BA US 2: *I was satisfied with the telecentre; that's why I was such a long user here.*	• Satisfaction with the telecentre • Expectations of the telecentre
BA US 4: *It was meaningful because I* ***learnt how to do things I didn't know before.***	• Meaningful learning • Satisfaction with the telecentre
BK US 2: *It had its benefits. In terms of the knowledge of the kids, in terms of IT literacy, together with other services and facilities such as letter writing and printing, photocopying. But for as long it was operating, it didn't perform 100%. It had its benefits, maybe 70& to 80%. It wasn't because it was irrelevant. The reason was because I think it was because of the operation time. It didn't follow a schedule; sometimes it was open, sometimes it wasn't.*	• Learning new information • Dissatisfaction with telecentre management • Satisfaction with telecentre
LL US 2*: Since the telecentre was around, I have been following the learning activities. We learnt and they taught us,* ***in the beginning I didn't know*** *what is the Internet and computer, but* ***after they taught us, I know a bit. Till now****, I still remember how to use email.*	• Learning experiences • Satisfaction with the telecentre • Meaningful learning

Table 4.15 Continued

LL US 4*: I don't remember exactly, as it has been quite some time ago, but it was all good information for us. It* ***gave us more knowledge*** *on how to use the computer, all of it was very positive.*	• Learning experiences • Meaningful learning • Satisfaction with the telecentre

Some respondents also mentioned that their satisfaction was mainly because of the ease of communication with family members and other people living outside their village.

Table 4.16: Selected responses 10

Selected responses	**Selected codes generated**
BA US 4: *I don't really remember much about the telecentre, only that we used to go there to connect to our family using the Internet.*	• Communication • Strengthen family ties
LL US 4*: Yes. We all felt that it was very good, because we can stay in touch with one another no matter where we are.*	• Strengthen family ties • Communication

While the community members stated that on a whole, they were satisfied with the trainings at the telecentre, they also shared that they often conducted **extra learning activities** among themselves, outside of the training hours. They would also **gather** and teach their younger children what they had learnt during the trainings, or to use what they learnt to teach their children.

Table 4.17: Selected responses 11

Selected responses	Selected codes generated
LL US 5*: I would* ***look for important things to teach my child****, and teach them. Others would do that. It was open for all, so whoever wanted to teach their children could do so in there. Teach them spelling, teach them how to write on the computer.* (*activities other than what was taught at the telecentre)*	• Meaningful learning • Knowledge sharing
LL US 4*: If it's about* ***anything that we don't know****,* ***we can go there and search****. Like when I learn a new word.* ***I will learn more about what I don't know, what I have never heard. I will look it up, on the Internet or ask other people.***	• Knowledge sharing • Learning within the community
LL US 5*: My children were young then, so I taught them things like colours, the alphabet, numbers. Learn how to read, and the colours, using the computer.* ***We taught them, as a community****. We would write on the PC and they would read. Before we had the telecentre, it was difficult to teach our kids. They were almost illiterate towards ICTs.* ***Now, we can teach them all sorts of things so that they have an understanding about what they need to learn.***	• Learning within the community • Meaningful learning

The respondents stated that there were changes in their learning and teaching approaches after they began using the telecentre. By using the facilities at the telecentre, they were able to teach their children more about what was once foreign to them, and they motivated each other to learn more at the telecentre by conducting these sessions as a group, whereby they would learn collectively as a community.

iii. Challenges faced with the telecentres

In terms of the challenges faced with the telecentres, most of the respondents reported issues that were primarily technical and managerial in nature.

Table 4.18: Selected responses 12

Selected responses	Selected codes generated
BA US 3: *Sometimes, when things go spoilt, or we don't know how to do something, we cannot do anything without them. So we need to wait for them to come back before we can ask again. But the problem is, sometimes we will forget our questions, so we end up not asking them.*	• Dissatisfaction with telecentre operations • Technical challenges
BK Vh 1: *If they (the managers) are there, the kids can use the place in the afternoon after school. Then they won't be so focused on playing outside.*	• Dissatisfaction with telecentre management
BK Vh 1: *The Internet is really problematic, as sometimes there is access, sometimes not. It also depends on the availability of power. That's the problem.*	• Connectivity challenges • Power challenges

One of the most critical comments made about the telecentre management was that it appeared to have denied the community members the chance or opportunity to use the facilities, and eventually, to benefit from the telecentre. The respondent continued to say that the telecentre would ultimately just be a non-functional space if no changes were made.

The comments made here suggest that the community members already felt demotivated to use the telecentre due to the problems they had faced with the telecentre management. Considering that the community was largely receptive to telecentre when it was first introduced to the village, these comments flagged the need to review ways to direct these sentiments towards becoming motivated and excited about the telecentre again.

One respondent from Long Lamai shared that they felt the trainings were too short, and that it did not seem sufficient to cover everything they wanted to learn. Based on this statement by the respondent, it can be surmised that the community members wanted more from their sessions at the telecentre, indicating that they were highly motivated to learn.

iv. Knowledge sharing activities

The community members at both Bario and Ba'Kelalan did not indicate that they actively initiated or participated in any knowledge sharing activities as following the training sessions at the telecentre. Their recollections regarding the learning activities they did at the telecentre were mainly the trainers' training sessions, and this was only done during the scheduled training sessions.

Other sharing of information was reported to have occurred outside of the telecentre and from others aside from the trainers or fellow community members who underwent the training.

Table 4.19: Selected responses 13

Selected responses	Selected codes generated
BK US 1: *They learn how to use Google, Facebook. They learn from their children, who know how to use the Internet. Then they came to the telecentre, and they turned the PC on; the first thing there is Google. So they search from there.*	• Knowledge sharing • Motivation to learn • Interest in the telecentre

The knowledge sharing here occurred between the children and the training participants, which does not indicate that knowledge sharing happened as a by-product of the training.

However, the community members in Long Lamai shared that they had regularly organised learning sessions outside of their scheduled trainings with the trainer team and that they gained a lot from the **sharing of experiences** and the conversations they had with the team.

Table 4.20: Selected responses 14

Selected responses	Selected codes generated
LL US 4*: It was great to gather there with the whole village and the UNIMAS people, we share what we want to share.* ***Being together, and having sharing sessions****. This is what I remember the most, because we always do that. Sharing experiences.*	• Learning within the community • Knowledge sharing
LL US 5*: We used to* ***sit together and discuss*** *at the telecentre.*	• Knowledge sharing • Learning within the community

According to the responses by the participants during the interview sessions, they particularly recalled these sessions because they enjoyed the exchanges with the trainers at the telecentre. One respondent stated that during these sharing sessions, the trainers would tell them their own experiences with ICTs and how they learnt the skills that they were now sharing with the users. By sharing their experiences with the users, the users were able to feel a shared connection with the trainers through similar experiences with ICTs. It also excited them to think that one day, they too would be able to share their experiences with other people, as to them, this meant that they would have also reached similar ICT literacy levels as the trainers. Apart from that, the respondents also stated that sitting together as a group allowed them to fully immerse themselves in the learning and sharing sessions.

v. Desired changes to the trainings at the telecentre (RQ2)

There were several comments on the changes that they would have liked to be made towards the training sessions at the telecentre, such as content that was **customised to their needs**, as well as **opportunities to have more discussions** or extra sessions with one another. It was also indicated that it would be beneficial to have someone at the village

who knew how to train the community as well as take care of the technical aspects of the telecentre, and having reference materials available.

Table 4.21: Selected responses 15

Selected responses	Selected codes generated
BA CE 2: *If it can be all in* ***local language*** *and that's what people said, oh, that's very important.*	• Localised delivery of content
BA US 3: *Maybe if we have* ***extra sessions with more people****, or if we can have* ***discussions****.*	• Community ways of learning • Communication
LL US 5*: It must be the right person. Be it a local or an outsider, as long as it is the* ***right person to teach****. Both are okay.*	• Localised approach to delivery
LL US 4*: Maybe books, guidebooks based on what the people from UNIMAS taught us. Books* ***that we ourselves make to teach people how to use****, the steps involved. This would be good and helpful for some people.*	• Guides to learn • Localised content • Customised content
BK FG 1: *We would prefer to have* ***face-to-face interaction****, and the people teaching us should be* ***locals*** *themselves*	• Interaction • Communication • Community ways of learning
BK US 2: *If we do activities that can improve your health, then you would get good responses. People will come. Especially those aged 60 and above (what interests the community members)*	• Customised content • Community interest
BK FG 1: Content of the learning should be relevant to the community*, including youths and elders. It would be good to have activities or learning sessions with regards to healthcare.*	• Customised content
BK US 2: *Because the community now is involved full time with their own activities, so I don't think they have the time to learn about what they should know. If there are classes or learning activities for the people, I think that would be good. But if we have* ***time allocated, like once a week,*** *then it should be okay.* ***Not daily****. I think if there were a proper schedule, it would have been better. (must cater to the needs of the community)*	• Training catered to the needs of the community • Customised content and delivery

Aside from that, the community in Long Lamai also revealed that they were interested in learning about other communities, or about the world outside, indicating that they are prepared to collaborate or communicate with outsiders in order to learn about more things.

Table 4.22: Selected responses 16

Selected responses	Selected codes generated
LL US 2*: I think we should still learn the basics, from start to the end. In the village,* ***most of us only know what kind of work is done in the village. To learn about the outside world, we should be taught****. And even if we have been taught before, it should still be revisited.*	• Learning from others • Motivation to learn
LL US 4*:* Trainings are also very important, because even for me, I am not that good**. I can do some things, but not at an expert level. I still have a lot to learn.**	• Learning from others

Looking at the statement made by the respondent, it can be surmised that there is a strong urge to learn, as well as want to achieve something from their learning. In this case, the respondent wanted to learn enough to be at similar levels to the experts from the project team; therefore there was a stronger intrinsic motivation for the respondent to do so.

4.3.3.2 Learning within the Community Members

Three sub-themes were identified within this second theme, namely (i) how we learn in the community, (ii) criteria for learning according to the community standards, and (iii) challenges faced today for learning within the community.

i. How can we learn in the community

The respondents were very responsive when asked about how they learned in the community. Many of them shared their own experiences with learning from their family

members and community elders. These responses shed insight into the learning methods that resonated with them and which they were more comfortable using.

Table 4.23: Selected responses 17

Selected responses	Selected codes generated
BA CE1: *I mean at home but not formally by the parents. Through* ***observation****, maybe. And of course, it's always through* ***talking in front of the younger children****; we keep on reminding them.*	• Community ways of learning • Observation
BA US 3: *We* ***learn how to do all that from our elders.*** *Like planting paddy, we cannot learn that in a classroom. We need to go to the field and see how to put the plant, we have to* ***touch and do it ourselves,*** *so we know how far apart to put, or how much water is needed for the plant.*	• Learning from elders • Community ways of learning
BA CE2: *Do* ***observation****. Like my granddaughter. My daughters have worked with us, the parents, and they did something now they stand alone. And my granddaughter. She start to work like cooking, whatever. So it's just from* ***observation and trying****. Nobody teach them, you must do this; this is how. We seldom do that. We prefer them to see and do it because* ***when they see, they do it, it lasts longer****. Rather than to write, hey, how this one need this one, what's next. Like recipes. I believe recipe, but I much more believe when in theory they do practically it will last longer.*	• Community ways of learning • Observation
BA US 4: *How do we learn? I don't know how to say.* ***I learn from you and you learn from me****. We* ***learn together, through interaction****. Last time, I could sit with my mother or grandmother or the other aunties and watch them as they do their work. We have* ***to connect with one another in order to learn something****.*	• Interaction • Learning from elders • Community ways of learning
BK FG 1: *We* ***share information with one another*** *quite frequently. How we do it… Take, for example, if we are learning a recipe. One person will* ***show us how*** *to do it, and we will* ***gather and observe*** *how she does it* ***before we try to do it ourselves****. The one that is showing us how to do the task will also teach us when we are not sure how to do it.* ***Observe and learn. We learn a lot from the people around us****.*	• Observation • Knowledge sharing • Community ways of learning

Table 4.23 Continued

BK TM 1: Follow, listen and practice*. We just learn from observation. We* ***look first****, then we* ***practice****. Different materials such as wood and bamboo have different methods of sharpening. How to tie, how to hold it up. We learn all that.*	• Observation • Community ways of learning
BK US 2*: Mostly, it's like* ***from a family*** *first. Then, if there are a lot of people, you do, la. There will be someone observing the other.*	• Community ways of learning
LL US 6*: The* ***elders will teach us first****; they are the ones who know more. We are used to learning from them. They will teach us how to do things, and we will learn from them.* ***They are our elders, the skills belong to them first, it is their knowledge that they pass down to us****. About games, handicrafts, what they used to do in the past.*	• Observation • Passing down of knowledge • Community ways of learning
LL US 4*: How we learn is when we don't know something,* ***we will ask****. We will* ***go to the experts in the community and ask*** *how to do something, and* ***they will share their knowledge with us.***	• Community ways of learning • Knowledge sharing
LL US 2*: We learn through* ***cooperation.***	• Collaboration • Community ways of learning
LL US 5*:* ***We taught them, as a community****.*	• Community ways of learning
LL US 6: *The community learns… like together on a daily basis. When* ***someone keeps observing, even if they initially don't understand, when they keep watching or seeing how people do it, they will understand eventually how to do it or understand the meaning behind it.***	• Community ways of learning • Observation • Learning from elders

The information gained from the community members were similar with one another in that learning for the community is through social interaction, is a hands-on experience, and learning happens in a natural environment. The community's comments also suggest that they would best benefit from an instructional design that catered more to their learning needs and methods and that community members themselves can play

important roles in executing learning activities at the telecentre. Also, based on the responses from the interviewees, the most important aspect of learning within their community is to learn together collectively. They also learn through observation, social interaction, as well as through knowledge sharing from the elders of the community. They also expressed that they learnt collaboratively and as a team and would always gather together so they could have discussions and dialogues together.

ii. Criteria for learning according to the community standards

The community members also stated what they believed learning to be, according to their community standards. The responses indicated that they placed a higher priority on knowledge sharing and learning about things that would benefit the community and the individual.

Table 4.24: Selected responses 18

Selected responses	Codes generated
BA US 4*: Knowledge should not be kept only in my head;* ***it should be shared*** *so that* ***we can all benefit from it****. What's the point if I keep it to myself? How will people learn?* ***That's why I want to share what I know with others****, especially my family.*	• Knowledge sharing • Learning within the community
BA US 2*: We must learn good things, things that will make us better people.* ***Learning is only good if we can use it for good things.***	• Knowledge sharing • Meaningful learning for community
BK FG 1: *Knowledge is good. It is powerful. It is good to know and to understand.* ***If it (knowledge) brings us benefits, then it has value****.* *People who have knowledge or are educated are valuable to our society.* ***They must also teach others what they know and how to be as good as them****. Those who do not possess these qualities have no use in society.*	• Value of knowledge • Knowledge sharing • **Transmission of knowledge**

Responses from the community members also indicated that they believed that while all knowledge is good, it would mean nothing to them if they did not know the knowledge of their people. For them, it was extremely important that their younger generation learnt the skills and knowledge of the people.

Table 4.25: Selected responses 19

Selected responses	Selected codes generated
BK TM: *If you do not have this knowledge; you are like a pole. You are like someone who as nothing. So you are empty.* *We must. At least, you must know 5 out of 10 skills. As long as it isn't 0. If you are 0, then you are useless. We need to learn everything, as everything is not simple.*	• Value of knowledge • Motivation to learn

The community is primarily motivated to share knowledge with the other members in order to ensure that their cultural and traditional knowledge is not lost. Based on this, it can be inferred that the community develops a sense of accomplishment when the younger generations are able to carry on with their traditions, as it can be seen that they have been successful in carrying out their roles as community elders.

iii. Challenges faced today for learning within the community

The respondents also shared their concerns about losing their traditional and cultural knowledge and the lack of interest from the younger generations to retain their cultural heritage. For the respondents, it is important for the younger generation should be educated; however, they must also prioritise their roots, culture and traditions.

Table 4.26: Selected responses 20

Selected responses	Selected codes generated
BA US 4: *We should go to school and find out more about the world outside, but* ***we must also not forget our roots****.*	• Importance of traditions and culture
BA CE2: *To be frank, sad to say, the passing of that one is so little now. Either sadly, it will die out. Because now, some of these young, oh, sorry, old people, they try to teach, but their young people are not interested.*	• Loss of traditional knowledge • Challenges of knowledge preservation
BA US 4: *I can't see my grandchildren all the time; they are not here. So how will they learn from me if they are not here with me? The younger generation now don't know about our past, about our traditions and culture.*	• Loss of traditional knowledge • Challenges of knowledge preservation
BK US 2: *The knowledge we are losing… Language, no. Song…. No. Because we sing Lun Bawang songs every Sunday. Dance… no. I think stories… maybe no. But maybe yes. And the music. The ones that we do with bamboo. That may be lost. Because there is* ***no younger generation to carry on the tradition****. There is* ***nobody learning*** *it. Stories… like me, I can tell some. After my generation, I don't think they will continue. Because kids now like to watch videos, modern stories. Play games. They don't care about things like that. They listen half-heartedly if they listen at all.*	• Loss of traditional knowledge • Loss of knowledge transmission • Challenges of knowledge preservation
BK US 1: *The biggest challenge is… how to keep it (store indigenous knowledge). That is the most difficult. How to keep it?*	• Challenges of knowledge preservation
LL US 2*: From what I see here, there are lesser encounters between us,* ***less communication.*** *Individualism is good, we get to do whatever we want, and this will happen one day, like in the city. We say that people in the city are bad, they are there in the city together but apart. They don't meet with one another often; they meet through the phone. This should not be the case in the village.* ***We need to meet one another****. Even though we are in the village, and we want the facilities,* ***we must maintain our close ties with one another****.*	• Loss of ties within community • Challenges of knowledge preservation • Loss of traditional knowledge

Table 4.26 Continued

LL US 2: *I think the* ***younger generation does not understand****. They* ***only know that they have work, they don't know about the other things involved.*** *They won't know that if we continue to rarely do work together, so* ***it will just be lost****.*	
LL US 5: *Nowadays a lot of youngsters* ***do not know about our history****. Maybe they are* ***not interested in reading about it.***	**Loss of traditional knowledge**

4.3.3.3 Strengthening Motivation

During the interviews with the community members, data were collected regarding the respondents' motivation to use or not use the telecentre, as well as ways to strengthen their motivation to share knowledge and co-create knowledge when partaking in learning activities at the telecentre. The areas of inquiry focused on components of intrinsic motivation, namely (i) curiosity, (ii) sense of accomplishment, and (iii) inherent satisfaction. Questions on ammotivation were also asked to determine why the community members did not do activities such as knowledge sharing or usage of the telecentre.

The sub-themes that were identified for the third theme are (i) telecentre usage, (ii) knowledge sharing at the telecentre, (ii) knowledge co-creation at the telecentre and (iv) learning at the telecentre.

i. Telecentre usage

The respondents from Bario revealed that they were mainly motivated to go to the telecentre to learn from others and observe what others were doing at the telecentre. According to one of the respondents, observing the tourists at the telecentre became

something of a norm for them to do at the telecentre. Similar responses were also obtained from the respondents in Long Lamai, who stated that the entire community was interested in using the telecentre.

Table 4.27: Selected responses 21

Selected responses	Selected codes generated
BA US 4: *A lot of tourists went there. I would go in to see what they were doing sometimes.* ***Maybe if I see what they do, I will also know how to do.***	• Motivation to learn • Interest in learning new things
LL US 4*: Yes, a lot. Maybe about 20 plus people at a time, because* ***even older people would join.*** *I mean older people like our grandparents, they would join.* ***They liked it.*** *Even the KK would join, but the majority of people were the youngsters.*	• Motivation to learn • Interest in learning

The users from Long Lamai shared that the excitement to have the telecentre was felt by everyone in the village, and even though the elders of the community hardly used the telecentre, they still learnt how to use it from their children and grandchildren. They viewed this experience as a fun activity with the family and stated that while they did not really need to use the telecentre, it was interesting to see what the computers could show them and to watch videos on the Internet.

Aside from that, some of the telecentre users stated that they used to go there to learn how to cook and to search for recipes. However, they also shared that they wished that they knew how to use the facilities more efficiently, as this would have increased their capabilities to make full use of the telecentre. Their statements suggested that they wanted to learn beyond what was shared during the training sessions and that motivation to use the

telecentre could be further reinforced with this knowledge or if they were given the chance to attend more training sessions.

One of the respondents also stated that if the telecentre was still functioning, this would bring the community closer, as they would gather together to have discussions and sharing sessions with one another; hence, this could improve the loss of communication problem among the community members.

Table 4.28: Selected responses 22

Selected responses	Selected codes generated
LL US 5: **If we know how to use the facilities, there are a lot of benefits**. We could learn a lot from there, things like cooking.	• Motivation to learn
LL US 2*: With the telecentre, we used to meet a lot more. We would know who is using the place, and each time it is being used, we used to have meetings at least once a month.*	• Motivation to learn • Social interaction

However, during an interview session with the telecentre manager from Ba'Kelalan, it was revealed that the community elders did utilize the telecentre much and would only use the services provided there. When asked further about why they did not want to use the facilities at the telecentre, the manager shrugged and said maybe it was because they did not think it was necessary for them, since there were managers at the telecentre who could do it for them. The manager further shared that the community members were not interested to participate in the training sessions at the telecentre, despite their efforts.

Table 4.29: Selected responses 23

Selected responses	Selected codes generated
BK TM 1: *The older people* ***rarely went to the telecentre to use the Internet****. Even if they went, it would be to use services like photocopying, making letters. We used to type it for them. (ammotivation / no motivation to use from the community)*	• Lack of motivation to use telecentre • Lack of interest from community
BK TM 1: *We would set a date but they would say that they are busy. So it passed, so we did it again, and again it passed. So we decided, okay we will do it this way. Whoever is around can come. Then* ***we waited and waited, but nobody came****. Till now. (no motivation by community to join training sessions)*	• Lack of motivation to join training sessions • Lack of interest from community

The question of non-usage of the telecentre was brought up with the community members, and from this conversation with them, it was discovered that many of the non-users of the telecentre were not motivated to use the telecentre for very specific reasons. According to the non-users, the main reason why they did not use the telecentre was because they felt that they would not be able to use the facilities due to their literacy levels. Many of the non-users had little to no formal education, and therefore were not able to fully understand the content of the trainings.

They also stated that they had little use for the ICT literacy modules, as the content did not relate to their daily lives; hence they saw no need for them to join in the trainings. However, they agreed that the trainings were useful for the younger community members, so they could equip themselves with the necessary skills needed for their education and careers.

Table 4.30: Selected responses 24

Selected responses	Selected codes generated
BK FG 1: *We are* ***not that interested in education or formal learning****. At this age, there is no need for us to learn anything academic, and we don't read much as well. It is* ***not relevant*** *for us. What we need is information on how to take care of our health and how to lead healthy lives. We also want to be able to communicate with our relatives who are not here with us in Ba'Kelalan.*	• Customised content • Transmission of knowledge

When asked what type of activities should be organised at the telecentre in order to motivate them to take part or join the sessions, some of the respondents started to suggest what they felt would motivate them to be part of the telecentre. Another observation made was that the community members would be more interested in activities that involved aspects of their lives and if the content of the training was more relevant to their needs and interests.

Table 4.31: Selected responses 25

Selected responses	Selected codes generated
BK FG 1: More activities *should be held so that the community will feel more committed towards participating.*	• Community needs and wants
BK Vh 1: *If the villagers want to learn, actually, they do want to learn. But if the people there do not* ***arrange activities and programmes****, how can they come? (strengthen motivation to go by organising activities)*	• Community needs and wants • Ways of learning in community
BK FG 1: *There should be more* ***learning activities where we can watch or see and learn because we need to experience it for themselves*** *in order for us to learn effectively.*	• Community ways of learning • Observation
BK US 2: *We need to* ***cater the courses to the needs*** *or that are* ***related to the village.*** *Especially for those in rural areas.*	• Community needs and wants

The comments point towards the earlier observation, whereby the learning activities must be more catered towards the needs and interests of the communities. The community members also suggested ways that could increase the motivation among the community members to use the telecentre, which included (i) more hands-on activities and (ii) content that was more relevant to their interests and needs.

Many respondents also felt that the telecentre was a suitable place to conduct learning activities, as it was a shared common space and was adjacent to the community hall; therefore, if they had hands-on projects or activities, there would be ample space to accommodate more people.

Table 4.32: Selected responses 26

Selected responses	Selected codes generated
BK US 1: *Since there is no other place here to learn. If you want to go to school, the elders will be embarrassed. The telecentre is suitable here; we have a good space. If there are a lot of people or participants, we can move it to the hall. It's suitable.*	• Future role of telecentre • Telecentre as a learning space

ii. Knowledge sharing and co-creation at the telecentre

In terms of motivating knowledge sharing at the telecentre, the respondents mentioned that they were keen to share their knowledge, however, they would be more inclined to participate in these activities if the training was more catered towards their interests and were delivered in a way that was easier for them to understand.

Table 4.33: Selected responses 27

Selected responses	Selected codes generated
BK FG 1: *We* ***enjoy sharing knowledge*** *with one another. We do it because* ***it makes us feel good, not because we want to gain anything (monetary) from it.***	• Knowledge sharing • Transmission of knowledge
BA US 1: Connecting with people *through the Internet and* ***learning about topics and issues*** *pertaining to health and livelihood. I would want to* ***share information and knowledge*** *on these matters.*	• Sharing knowledge • Learning from others
BA US 4: *I want to* ***learn from others about things that I don't know****. And I have* ***things that I know; I want to share that knowledge*** *with others too.*	• Learning from others • Sharing knowledge • Passing on knowledge as expert
BK FG 1*: If we can* ***be trainers ours****elves we would want to do that. I am sure we can teach others if it is about our daily lives, or something that we are good at.*	• Sharing knowledge • Passing on knowledge as expert • Knowledge transmission

As for knowledge co-creation at the telecentre, they stated that they would want to participate in activities that involved more creation from them, instead of just being recipients of knowledge. When queried further about being creators of knowledge, the respondents stated that they wanted to learn from others as well as let others learn from them.

Throughout the conversations with them, they also detailed the fun they had when sharing knowledge with each other, such as when they were learning recipes from one another. They enjoyed the exchange of ideas and the excitement of seeing their creations at the end of each cooking session.

Table 4.34: Selected responses 28

Selected responses	Selected codes generated
BA US 1*: I might not know so much myself, but what I do know, I must pass down*	• Knowledge transmission • Community ways of learning
BK FG 1: *We want* ***to keep our knowledge for our children****. If people take videos of us, or we can* ***learn how to make these videos****, it would be good.*	• Knowledge preservation • Interest in learning
BK FG 2: If we can be trainers ourselves, we would want to do that*. I am sure we can teach others if it is about our daily lives, or something that we are good at.*	• Knowledge sharing • Passing on knowledge as expert

In contrast, the Long Lamai community shared that they had already taken part in knowledge sharing and co-creation at the telecentre without anyone telling them to. When asked further as to why they took the extra effort to do so, they just stated that it was just something that they did together.

Table 4.35: Selected responses 29

Selected responses	Selected codes generated
LL US 2: *I did teach some of the villagers as well, my friends. As much as I could teach them, I would.* ***This was not an individual effort****. Everyone was involved. Learning at the telecentre should be that way. It should be* ***as a collective group. We learn together****.*	• Community ways of learning • Interaction
LL US 6*: During the training, only those who attended knew what was going on. For those who didn't attend, we would teach them then. The younger kids would be our teachers, and we all learn from them.* ***That's how it is here. When one person knows, then they will teach the others so that they know as well****.*	• Community ways of learning

The researcher then asked them how this was conducted and the methods of teaching and learning that they practised when learning together.

Table 4.36: Selected responses 30

Selected responses	Selected codes generated
LL US 4*: We have our own trainers; also, we can ask them to come and teach. If they were not available, then we ourselves would teach one another, based on what we learned. Or whoever that wants to learn, can just let us know and we will gather there. They can tell us what they want to learn, and we will all teach them together. Whatever they want to learn, and we teach them so they can remember. We teach them step by step, and slowly so that it is easier for them to learn. It is difficult for them to remember, so we keep repeating what the content is, so that they can remember.*	• Community ways of learning • Learning through interaction
LL US 5*: Yes. Some people would ask me to teach them, but mostly the elder people. Children would know already because they learn at school. The elders would want to learn how to look at pictures and information, and how to write and delete words, they were not interested in email and such. The important thing is that I learned how to use the PC, I taught my children and father.*	• Community ways of learning • Transmission of knowledge

The respondents also said that it was fun for the community members to learn together, as they would support and encourage one another throughout the process. It was such a good experience for them that they would go beyond the hours of training and continue at home.

Table 4.37: Selected responses 31

Selected responses	Selected codes generated
LL US 4*: Sometimes, after that they would stop. Not stop, but* ***they would start practicing at home*** *with the 1Malaysia laptop. So, they would* ***ask their children or grandchildren to help them.***	• Community ways of learning

iii. Learning at the telecentre

The respondents had very strong ideas of what they wanted to learn at the telecentre. While some respondents mentioned that they were still interested in ICT literacy, many stated that they were keen on learning from other people. When asked further, they said that there were things that they did not know, but others were experts of, and this was something that they wanted to learn in more detail. It was also mentioned that they could learn through constant observation; hence, it would be good if there was a way for them to revisit the content or materials of the training at any time they want.

Apart from that, the respondents also stated that they would want to learn a variety of things at the telecentre, ranging from ICT literacy, ways to improve their quality of life, as well as indigenous knowledge preservation. Several respondents also stated that they wanted to learn about other cultures, the world outside, as well as content that would allow them to build on their current knowledge.

Table 4.38: Selected responses 32

Selected responses	Selected codes generated
BA CE2: *advancements, like now, ICT as you said. Those people need to be taught and to have a good practice.*	• Interest in learning
BK FG 1*: (we want) the opportunity to* ***learn about different things****. We also want to learn how to* ***document knowledge in a digital format****.*	• Interest in learning • Using ICTs for knowledge preservation
BK US 2*: We should* ***learn about everything****. IT knowledge, we should have PCs to cater for the elders. Mobile devices are small; they prefer bigger screens. That would be better. With laptops, there should be slides and all.*	• Interest in learning • Using ICTs

Table 4.38 Continued

BK US 2: *I want to see them (the users) with knowledge, how to* ***increase their quality of*** *life, and the know-hows to* ***improve their economic status****,* ***how to teach their children and grandchildren.***	• Interest in learning • Knowledge transmission
BK Vh 1*: Cultures, traditional knowledge, computer knowledge,* ***things related to our daily lives.***	• Interest in learning • Knowledge preservation
LL US 6*: I used to go to the telecentre to learn English, to* ***learn about the world outside****. If there was someone to train us, it would be better. I want to* ***learn more about other cultures****, to* ***know more about what others are doing.*** *The handicraft sometimes, one village is different from the other, what they have is not what we have here and vice versa. Maybe then* ***we can share, learn from their knowledge*** *to implement here. Then* ***we can also share our knowledge with them****.* ***That is how we learn, as a community, from each other.***	• Learning from others • Knowledge co-creation • Knowledge sharing
LL US 5*: I hope that the kids who use it can learn a lot from there, I hope that they use time properly to learn, I hope that they can* ***learn well*** *about computers and* ***look for useful information that they can use in their studies****, so that they can* ***become useful people****.*	• Interest in learning • Benefits of learning

The statements above show that the community members are intrinsically motivated to learn more about other cultures and other people in order to further improve or innovate on their existing knowledge. One of the respondents also stated that there were times when they would sit with other people from different places and have conversations about handicrafts and other subjects of interest to them over snacks and tea. Although the respondent said that this was just casual conversations between friends, the respondent also stated that these conversations had led towards the innovation of the designs used in the handicrafts the community made later, as the conversations gave them ideas on how they

could change the design or improve their current work. The respondent also said that it was a fun experience for them because they could use their discussions with one another to create new things, which they never thought of before.

4.3.3.4 Community Priorities

The fourth theme identified was concerning community priorities, or what the community sees as most important to them in terms of their learning. Two main concerns were seen repeatedly mentioned by the community members, namely (i) knowledge preservation and (ii) ways to overcome challenges faced in knowledge preservation.

i. Knowledge preservation

A main concern for the community pertained to knowledge preservation. Many of them shared the same sentiment that they need to share their history and stories with the younger generation. As discussed earlier, this was one of the main challenges faced by the community, and the community members stated that this should be first addressed when planning future learning activities at the telecentre or with community members. The community members were very clear about what type of knowledge should be preserved and shared some of their thoughts on this with the researcher.

Table 4.39: Selected responses 33

Selected responses	Selected codes generated
BA US 4: *This necklace, how to thread it, what the beads mean. My grandchildren should know, I must tell them, the way I learnt how to make it myself. They cannot be called (one of us) if they don't know what we know and if they cannot pass that knowledge down to the next generation.*	• Knowledge preservation • Transmission of knowledge

Table 4.39 Continued

BA US 2: *I should show what I know to my grandchildren. I should tell them how things are done, how we make our beadwork.*	• Knowledge preservation • Transmission of knowledge
BK Vh 1*: Our* ***customs and traditions****, that is very important.* ***So that the younger generation does not forget what we already have in existence.*** *The old stories. Like us now, there are some of those who are really old, they don't remember. I am also talking about myself. If you are talking about those old tales, I really don't remember anymore. There may be 2 or 3 old people who still remember, those old tales. The environment. history is also important.* ***Nowadays, the younger generation does not know anything about our past.***	• Knowledge preservation • Importance of culture and traditions
LL US 2*: For me, the most important is to* ***protect our rights and our culture****. We used to work closely together, but now no longer. This is the one thing that we should never leave or lose.*	• Knowledge preservation • Community ways of life
LL US 6: *The most important thing for us to learn now is our handicrafts, it's a dying knowledge.* ***The youth, the teenagers, they are not interested in making handicrafts*** *now. If possible,* ***we want to teach the youth how to make it****.*	• Knowledge preservation • Transmission of knowledge

The respondents were very adamant that they were merely the gatekeepers of their traditional knowledge, and they had to pass on what they know to the younger generation. However, they also conceded that this was becoming a difficult task to take on, as many younger community members were no longer living in the highlands with them; therefore, there was difficulty in attracting their interest in the traditional ways of the community. It was also informed that the younger generations were not as committed towards learning about their traditional ways, and may know the motions, but do not understand the meaning behind it. Therefore, the respondents were then asked for their opinion on what ways would be useful to overcome these challenges.

ii. Ways to overcome challenges faced in knowledge preservation

In considering ways to overcome these challenges of knowledge preservation, the community members stated that there should be ways of incorporating ICTs into the documentation of their traditional knowledge, as this would appeal more to the younger generation of digital learners.

Table 4.40: Selected responses 34

Selected responses	Selected codes generated
BA US 1: *learn how to preserve their knowledge more efficiently (e.g. through video documentation)*	• Knowledge preservation
BA US 4: *I think we need to document our indigenous knowledge properly. Like how you watch on YouTube. We should make videos and share so that people can watch and learn.*	• Knowledge preservation • Knowledge sharing
BA US 5: *we should make videos and show them. So they can learn how to make our food or our traditional bead weaving.*	• Knowledge sharing
BK US 2: *In a digital format? Can that be done? Teach us how to do that.* ***If we can keep the CDs and softcopies, hardcopies****. We need to be taught how to do this.*	• Interest in learning
BK Vh 1: *We should* ***make videos*** *on our knowledge, the conditions of our surroundings, actually there is a lot that we need to make.*	• Interest in learning • Knowledge preservation
BK US 2: *Previously it was Denuq Ileh, which means Knowledge Centre. This is good, it means everything is there. Traditional, modern. Traditional… I think the basic setup is like this, my opinion, the place can become like a museum. Any traditional materials or whatever it is that was used by our ancestors last time, if it is still available, we display it. Baskets, tools, whatever we used last time, just display. So that the kids can learn about it, informally, when they go there. This is how learning can happen. If they want to learn about it more in detail, they can ask.*	• Future role of the telecentre • Knowledge preservation

There were also suggestions to have an offline solution, in order to overcome the problem of network connectivity and power supply. Respondents from Long Lamai also stated that as the village was still not equipped to support online services, it would be beneficial if there was a space to display their traditional items, or a library documenting their history.

Table 4.41: Selected responses 35

Selected responses	Selected codes generated
BK US 2: *Offline learning, using a CD, or the TV. Like, if I want to learn how to cook, I can watch a video or something to learn about how to do it. Even for flute making, we need a video to show the process from the start.* ***This can be done. As long as we have the tools****. When you* ***combine traditional and modern knowledge, we will go to the next level.***	• Using ICTs for knowledge • Transmission of knowledge
LL US 5: *We should have* ***a library on the history of our village****, nowadays a lot of youngsters do not know about our history. We should have books that are beneficial for them, because not everyone has access to the same book in each house. So if we have a copy, we can keep it there and it* ***benefits everyone****.*	• Potential future role of telecentre • Knowledge preservation • Transmission of knowledge
LL US 2: *If there is no Internet, then we should use the* ***space for keeping our cultural things****. Our traditional items, such as our weaving. Make it like* ***a museum****. It would be better for the community, I feel.*	• Potential future role of telecentre
LL US 6*: How to make the telecentre sustainable? Those from (other organisation) said that they wanted to make it bigger, and then they will make some part library, some part for the computer room, something like that. Maybe if that is around, then we can learn from books. Or we can teach the children, the youth on how to make handicrafts.*	• Potential future role of telecentre • Knowledge transmission

The suggestions that the community provided during their interviews showed that they were keen on finding ways to solve the problem of knowledge preservation, by using both online and offline methods. Considering that the current infrastructure at the sites are not yet suitable enough to support full usage of ICTs (internet connectivity), these suggestions indicate that there is a need to address these concerns, and consider how ICTs can be adapted to the needs of indigenous communities.

4.4 Recurring Codes and Themes

From the data collected from the respondents at Bario, Ba'Kelalan and Long Lamai, the researcher looked at the overarching themes that emerged from the different codes across the data set, and the formation of subthemes in the codes. The themes were generated using the coded data extracts and formulated in a way that brought meaning and identity to the experiences shared by the respondents. Following this stage, several connections between the respondents were identified, especially with regards to their experiences at the telecentre, ways of learning within the community, community priorities. Similar patterns of responses were identified, and initial coding assigned to the responses were changed to reflect the themes more accurately.

It was also found upon reviewing of themes, that while the patterns of responses from the respondents revealed that the three sites displayed similar patterns, there were emergent themes that were seen among the responses in Long Lamai that were not found in Bario and Ba'Kelalan. Interestingly enough, these themes in Long Lamai were largely related to the ways that the community learns together, and how this was practiced during the period that they were participating in the learning activities conducted at the telecentre.

These aspects which made the experiences at the telecentre different at Long Lamai were also revealed to be the key concerns and observations made by the trainer team as well as several community members at Bario and Ba'Kelalan, particularly in areas addressing community priorities as well as community ways of learning.

Table 4.42: Example of final coding and themes

Selected categories	Initial coding	Final coding	Selected Themes
Culture and traditions	Content focused on indigenous culture	Importance of culture and traditions	Community priorities
Content of modules	Content customised to needs and interests	Customised content	Ways of learning within the community
Interest to learn	Interest in learning new things	Learning from others	Strengthening motivation

Once the themes were identified, details of the themes in relation to the research questions were identified. In this study, three research questions were used to guide the research, namely:

Table 4.43: Identified themes based on research questions

Research questions		Identified themes and subthemes (selected)
1	To what extent did the current instructional design model used at the telecentre motivate knowledge sharing and knowledge co-creation among the community members?	• User/ learner experiences at the telecentre • Community expectations and responses • Training and instructional design used at the telecentre

Table 4.43 Continued

2	How can an indigenised instructional design used in learning programmes at the telecentre motivate knowledge sharing and knowledge co-creation among indigenous community members?	• Knowledge sharing activities • Learning within the community • Criteria for learning according to community standards • Strengthening motivation
3	How can the telecentre support the learning needs of indigenous communities, especially as a platform for teaching and learning, knowledge sharing, and knowledge co-creation activities among indigenous communities?	• Desired changes to the trainings at the telecentre • Community priorities • Ways to overcome challenges faced in knowledge preservation • Knowledge co-creation at the telecentre

Using the analysed data obtained, a list of criteria raised by the community members was compiled:

1. Usage of different ICT formats for knowledge preservation
2. Content focusing on their indigenous culture
3. Content delivered in own indigenous language
4. Product to meet with their own priorities (knowledge preservation)
5. Activities that would improve, build, and develop skills, abilities, and experiences

6. Delivery of content using community ways of learning (social interaction, discussion, observation)
7. Content that can be shared with other people and bring benefits to the community
8. Content that is customised to their needs and interests
9. Content that can encourage indigenous knowledge preservation and strengthen the sense of identity within the community
10. Ways to disseminate knowledge to the younger generation

Based on these observations, together with findings in existing literature, an indigenised approach towards instructional design was developed. A selection of requirements for the indigenised instructional design is proposed below:

Table 4.44: Selected requirements

No	Requirement	Source
1	Awareness of learner needs and preferences	McLoughlin & Oliver, Indigenous community
2	Include multiple cultural ways of learning and teaching	Henderson, McLoughlin & Oliver, Indigenous community
3	Communication and social interaction	McLoughlin & Oliver, Indigenous community
4	Authentic task design	McLoughlin & Oliver, Indigenous community
5	Multiple perspectives and access to resources	McLoughlin & Oliver, Indigenous community
6	Scaffolding and support	McLoughlin & Oliver, Indigenous community
7	Flexibility in goals, modes of assessment and learning outcomes	McLoughlin & Oliver, Henderson, Indigenous community

Table 4.44 Continued

8	Tutor roles	McLoughlin & Oliver, Indigenous community
9	Collaboration and co-construction	McLoughlin & Oliver, Indigenous community
10	Clear communication of aims, objectives, and requirements	McLoughlin & Oliver, Henderson
11	Self-direction and integration of skills	McLoughlin & Oliver
12	Emphasis on community priorities (e.g. indigenous knowledge preservation)	Indigenous community
13	Strengthen the sense of identity	Indigenous community

4.5 Phase Two: Community-led Learning Programme

Having determined the gaps based on the inquiry with the project team and the community members from all three sites, the next phase of data collection involved the testing of the indigenised instructional design at two sites, Bario and Ba'Kelalan, where the community members were participants of a community-led learning programme that focused on the community and exploring the delivery of all-encompassing learning in a isolated, rural setting by their own local champions (Kulathuramaiyer, et al. 2020). Interviews and observations of the learning programmes were centred around the adapted selection of requirements identified during the first phase of inquiry, and further observations and notes were taken from the second phase of investigation.

The data collection in this phase involved both the project team initiating the programme and the community members from two of the telecentre research sites, namely Bario and Ba'Kelalan. Community members that were involved in the community-led learning activity also consisted of both users and non-users of the telecentre and had also participated in the first round of data collection.

Document data was also collected from the trainer team, and the researcher was given the opportunity to go along with the research team during the rollout of the programme with the community. Through this, the researcher was able to observe the community as they took part in the programme from the beginning of the project and take note of the changes of their motivation to participate in the project. Data was collected from the participants in two stages, one prior to the rollout of the activities and another after the rollout of the project.

From this phase of inquiry, it was anticipated that the data collected would elicit more information to answer the research questions of this study, particularly when considering the representation of cultural considerations in an instructional design and whether an indigenised instructional design would be effective in encouraging knowledge sharing and knowledge co-creation activities among the community members.

4.5.1 Project Team

Document, interview, and observation data were collected from the project team during the deployment stages of the learning activities. Like the vein of inquiry in the earlier phase, the project team members were asked questions regarding the community needs, development and implementation of the training materials used in the learning activities, reception of the participants towards the activities, assessment methods used, and the inclusion of indigenous ways of learning into the activities.

From the interviews, it was found that the choice of ICTs to be deployed during the programme was decided upon by the project team and included platforms that suited the purpose of the project. As the focus of the project was to explore an inclusive, people-centred platform that would open opportunities for underserved communities to fully

leverage on, the selection of communities was done to reflect this focus. Aside from that, both communities had also participated in the previous telecentre projects initiated by the project team and had expressed a keen interest in participating in the current project. The team initially had a list of modules that could be run with the community members, however, upon conducting the needs analysis with the potential participants, it was understood that the community members preferred modules that were relevant to them, such as modules concerning health, food, handicrafts and knowledge preservation. Hence, the modules were then redesigned to reflect their needs and wants, and the community members were consulted on the content, way of delivery and ways of assessment that would be best suited to the needs of the community. Community members were encouraged to use their native language throughout the project, and efforts were made towards translating the content into Bahasa Malaysia, for the convenience of other users who were unfamiliar with the native indigenous languages of the communities.

In addition, it was found out that the community members were keen on embracing the role as a trainer, instead of just as a participant to the programme, which gave the project a more community-centric focus. During the planning of the project, the team considered the location and the available infrastructure at the research sites, and whether the infrastructure would be able to support the technological needs of the project. The team also proposed several options that would overcome the existing technological issues, before an ideal system was deployed at the site. The team had also made efforts to understand the target audience, as evidenced by the needs analysis stage, as well as the numerous meetings held with the community leaders and members to understand their interests, concerns and what they hoped to achieve from the programme. Through this stage of analysis, the team was able to understand that one of the biggest problems faced

by the potential participants was their limited literacy, hence solutions to overcome this was proposed and accepted by the community.

The project team made use of several platforms that would ease the dissemination of the content. Usage of these multiple platforms also indicate the use of effective technology throughout the project, as the team considered both online and offline platforms during the execution of this programme. The team diversified the ICT formats for the community members, as in cases where there were issues with using the online platform, the team then saved the content into USB drives and delivered the content to the community. Aside from that, the team and the identified local champions also used different avenues to deliver the content to the community members, such as by sharing the content on cloud storage platforms so that the material could be downloaded at any time that was convenient for the community liaison.

Storyboards and visuals that was used in the production of the content was discussed between the project team and the community members. As the community themselves decided on the topics that they wanted to share their knowledge on, the community liaison assisted the community trainers with the development of the storyboard as well as recording of the content, and what would best represent the community.

The project team also took steps towards ensuring cultural representation within the research team, as a cultural expert who belonged to the same ethnic group as the indigenous communities as the research site was a key member of the team, and this cultural expert acted as both the advisor to the team as well as the key liaison person between the research group and the indigenous communities. The project team also consisted mainly of academic staff from the university, who not only had a background in

Education, but were also culturally informed due to their many years of working closely with indigenous communities, as well as their familiarity with to the community protocol of the indigenous communities at the research sites. The team members were also committed towards meeting with the learning needs of the target community, and they strongly believed in the potential of adapting existing online learning platforms to become one that was more culturally inclusive of indigenous communities.

Multiple forms of assessments were deployed during the execution of this learning activity, one of them being online quizzes at the end of each topic in the module. The testing methods for these quizzes varied between short answers, multiple choice and uploading their own videos to the platform. Considering that some of the participants had limited literacy capabilities, the community liaison acted as their representatives in answering these quizzes. There were also discussion forums whereby the participants could leave responses and comments on the module, as one of the key ways of learning within the community is through social interaction and discussion. The discussion forum allowed this to happen between the communities, although the responses had to be delivered and recorded by the community liaison for some of the participants. Feedback received on the modules were also brought to the attention of the community trainers, as this was a way for them to continue building on their work.

4.5.2 Community Members

The two chosen sites were also research sites during the telecentre project, and the participants for this second stage of interviews came from the same pool of respondents who had participated in the first stage of inquiry. Although the number of respondents had reduced compared to the first round of interviews, the researcher chose to proceed with this

smaller number of participants because they would be able to shed insight on the differences between the initial trainings at the telecentre and the current programme. Through initial conversations with the respondents, it was found that the findings during the first stage of inquiry with the community members were still valid, particularly for the following areas:

1. Community ways of learning
2. Knowledge sharing activities
3. Knowledge co-creation activities
4. Community priorities
5. Desired changes to the modules at the telecentre

Based on the respondents' feedback, the researcher was then able to proceed with the research and concentrated mainly on the areas that had been identified as gaps in the initial rollout of the telecentre programme as well as the following:

1. Expectations of the community with regards to ICTs
2. The role of ICTs in preserving indigenous knowledge
3. The role of the community in using ICTs to preserve indigenous knowledge

Interviews were conducted in two stages: before and after the rollout of the programme. The reason for doing this was to observe their expectations prior to the rollout of the programme and to capture their experiences after going through the activities, as this would highlight the differences in perceptions that they had, especially in terms of motivation to share knowledge and participate in knowledge co-creation activities.

4.5.2.1 Before Rollout

i. Perceptions of the community with regards to online learning courses and ICTs

When the participants were first introduced to the programme, they reacted mainly out of curiosity but were concerned that as they had very little prior knowledge, if any at all, of online learning courses and ICTs. According to the respondents, their knowledge of ICTs was limited to using the telephone to contact their family members and friends. A few of the respondents stated that they did have social media accounts; however, they used this platform mainly to view photos and updates of their family members. Their initial perceptions of ICTs and the programme was therefore limited to connecting with their friends and family, as well as to socialise.

According to one of the respondents, the previous experiences with the telecentre provided an insight into the potential of ICTs; however, due to issues such as connectivity and electricity supply, there was little enthusiasm with ICTs that were provided at the telecentre. Other responses were more enthusiastic, as it was stated that many community members might not have an understanding or expectation of what ICTs and the online learning programme could bring for the community, but this could be overcome if clear explanations regarding this were made to them.

> ***BK Vh 1****: Initially, they will not know what this is all about, but after it is running, they should know. Step by step. They will understand. If we do not have a clear and in-depth explanation about it, maybe they will not understand. But this is a good thing, very exciting.*

On the other hand, the participants were enthusiastic about social media as they saw it as an effective way to share knowledge with many people. It was mentioned that they wished they knew how to create more content on their social media platforms, as currently, they are mere followers of others.

ii. The role of ICTs in preserving indigenous knowledge

> ***BK Vh 1:*** *The knowledge centre… we do hope that it can give us a new push, and motivation. An attraction for the younger generation.*

Some respondents stated that they felt that ICTs could be effective in preserving indigenous knowledge, especially as the younger generation is more interested in ICTs rather than the stories of the older generation. It was mentioned that digital documentation of their indigenous knowledge would be useful for them so that there would always be a point of reference for the community members and the younger generation, especially as most of the community experts are getting older but there was nobody in the village to inherit their knowledge as many of the younger community members were not living in the village.

> ***BK US 2****: That may be lost. Because there is no younger generation to carry on the tradition. There is nobody learning it. Stories… like me, I can tell some. After my generation, I don't think they will continue… Offline learning, using a CD, or the TV. Like, if I want to learn how to cook, I can watch a video or something to learn about how to do it. Even for flute making, we need a video to show the process from the start. This can be done. As long as we have the tools.*

They were also of the opinion that ICTs could be used to complement indigenous knowledge, and technology could be used to ease the work of the community. An example given to highlight this was the use of electric fans to help them husk paddy, compared to the traditional ways of fanning. By using technology to aid their tasks, they were able to reduce the production time, allowing them to work more efficiently. Based on their experience with this, they were convinced that ICTs would be able to aid them in the preservation of their knowledge as well.

> ***BK US 1****: Unless the traditional knowledge makes use of ICT, then that is ok. It should be parallel.*

> ***BK US 2****: When you combine traditional and modern knowledge, we will go to the next level.*

iii. The role of the community in using ICTs to preserve indigenous knowledge

When asked about what they perceived was the role of the community in using ICTs to preserve indigenous knowledge, the respondents stated that it could be possible if they made videos to document their knowledge and to use that to pass it down to the younger generation. However, their initial idea was to record themselves doing the activities, and there was no indication made by them that they could take on the role as a tutor or trainer for the activity that would be recorded.

4.5.2.2 Post Rollout

i. Perception of the community with regards to ICTs and online learning courses

The respondents stated that they enjoyed the process of creating an online learning activity, as they were could choose the topics to share and could plan how to narrate the

story that they wanted to tell through the activity. According to the respondents, initially, they were worried about talking in front of the camera, but with the help and encouragement of the community, they braved themselves and took on the responsibility to become a community scholar and trainer for the programme.

> ***BK FG 2****: "I think maybe we know more about MOOCs (learning programme) now. Not very good, but I think maybe better than when we started."*

Another reason why they were invested in the creation of these videos was because they wanted to share their videos with their families, as this was their main goal – to share and disseminate knowledge that they had. This was also one of their main motivations to continue recording videos of themselves.

> ***BK FG 2:*** *"I didn't know what MOOCs (learning programme) was when I started. Now, I think I know more about it. At least I know, I can tell my grandchildren that I made a video that they can watch on their phone. That is good enough for me."*

ii. The role of ICTs in preserving indigenous knowledge

Respondents participating in the programme stated that before they participated in the project, they had always thought that ICTs could play a role in the preservation of indigenous knowledge. Following the project, they were convinced of this fact, as they saw first-hand how they could share their knowledge with others. One observation made was that community did not depend entirely on the platform chosen for the activity specifically to share the knowledge, but had shared the videos through social media platforms with

their family and friends who were in the group chat. By sharing the videos with others through these social media platforms, they were able to reach out to people who were not in Sarawak but residing in other places and countries. Feedback received from the group chat also showed that the younger generations were interested in what they were producing, with some of them asking the elders to make more videos to share with them.

From these exchanges, it was clear to the community that by making use of technology to document their knowledge, they could ensure that what they knew would be passed down to the future generations, as well as to others interested in learning about their traditions and culture.

iii. The role of the community in using ICTs to preserve indigenous knowledge

The community later shared that although they were shy at first to record themselves, the feedback received from their family and friends served as a form of motivation for them to continue. Although they said that they had to overcome their initial awkwardness and fear of the camera, when they realised that this was an effective way for them to share their knowledge, they decided to brave it and proceed with the tasks. They also shared that it was fun for them to watch their friends in the videos, and after viewing each other's videos, they would suggest ways to improve their next recording session to one another.

> ***BK FG 2****: I want to learn more about how to make videos and put it on the Internet. I like seeing myself and my friends on this screen."*

Aside from that, just knowing that their grandchildren were watching their videos made them happy to know that they were still teaching their grandchildren, despite being

miles apart from each other. As elders of the community, they felt that their role was to ensure that the knowledge of their elders continued to pass down to the future generations, and through these platforms, they were able to do so. Hence, they believed that using ICTs is the way forward in passing down their history, traditions, culture and stories.

4.5.2.3 Observations

The researcher was also able to observe the changes among the members of the community as they took part in the programme. Prior to the project, many of the participants stated that they had very little interaction or need for ICTs in their lives, with the exception of staying in touch with their friends and family members and to get information pertaining to health, cooking and their livelihood. They had never heard of MOOCs and were curious about the project, but at the same time, were sceptical about their role. As the project team initiated the discussions with the community members, they started to gain understanding of the project and saw it as an opportunity for them to learn more about things that they did not know. They were particularly interested in the premise of learning from other communities that were part of the project as well. However, the community members from both research sites expressed that they were not particularly interested in learning about topics pertaining to improving one's economic status but inquired if modules on culture and indigenous knowledge preservation could be made. They also stated that they wanted to share their knowledge with other people, especially their traditional delicacies and handiwork, as they saw that modules created by the other participants included culinary skills.

Throughout the recording process, the community liaison (CL) assisted with technical support, whereas the community members themselves contributed towards the

ideas and direction that the video should focus on. The CL mentioned that they would discuss together as a group what they wanted to show and who should do the demonstration and narration. According to the CL, they would get up early and prepare the materials and were always very excited when they were informed that a video recording session would be scheduled. When asked why they were so excited, the CL stated:

> *"This is something new for them, and they have always been listening to others. Now, they get to tell people about what they know, and* ***to know that people will learn from them makes them happy****."*

The CL further explained that their experiences with the programme is vastly different from what was experienced at the telecentre, mainly because of the reversal of roles from learner to trainer. However, it was noticed that they enjoyed the sessions more because they could share their knowledge in a way that was familiar to them; therefore, they could immerse themselves in these sessions. The only difference was that they were being recorded, but as they explained the processes and demonstrated how to make the products, it was as though they were simply passing down their knowledge to another member of the community, and it came naturally to them.

It was also because they could feel at ease with the session that they were even more motivated to create more content. These observations of the community as participants of the programme, brought to attention their motivation to share knowledge with others and co-create knowledge together, and to explore why their motivation was strengthened during the programme.

i. Motivation to share knowledge with others

During the workshop that was organised at the site, the researcher was able to sit with the participants and listen to them talking about the videos that the project team shared with them. The participants expressed that their motivation to share knowledge was further increased as they watched the videos made by the other community and were surprised to see that there were many similarities between what they made and what the other community produced. They would then comment on which aspects were similar and different to their own practices before discussing what they could show the other community next when they experimented with making the products later on. They would also ask about the types of materials they used and where they procured the items.


Figure 4.2: Focus group 1

It was observed throughout the session that the participants were all intrinsically motivated to know, to accomplish and to experience stimulation as they **kept asking questions out of curiosity** and expressed that **they wanted to attempt making the same items** as the other community **before trying to adapt it to their own designs and creations**. They were also very animated while watching the videos, eager to point out what was different from their own creations. Every participant was also quick to comment and nudge one another when they had any ideas of what they could do as their response

video to the other community. The participants were also in **good spirits throughout the sessions** and were **actively exchanging ideas and discussing with one another** about the content of the video.

Figure 4.3: Group Discussions

The researcher queried the participants, who were mainly non-users of the telecentre, on why they were more invested in the programme rather than the ICT literacy training conducted at the telecentre. They shared that the main reason why they did not join in the training sessions at the telecentre was because they felt that it was not suitable for them, especially as they had limited literacy skills. Although they wanted to know how to use computers and to learn how to use technology, they did not do so because it was not something they would use in their everyday lives. However, with programmes such as the current programme, they can see **how they could contribute** and how they can learn new things using these ICTs. Also, they preferred the **informal nature of the programme**, where they could feel at ease to interject and contribute their thoughts and ideas because they were all involved in a discussion as a community. Aspects such as social interaction, learning through observation, and group discussions, and the focus on authentic tasks that they could relate to were what set the programme apart from the ICT literacy training at the telecentre.

ii. Motivation to co-create knowledge together

Figure 4.4: Co-creating deisgns

Throughout the programme, the participants were always **discussing together** on how to attempt new projects jointly, and were always **exchanging ideas and thoughts** on ways to make the patterns unique to them as well. Through these sessions, they would **also share stories** and little instances of how they created a design or tried different colour schemes to make the products more vibrant. The dialogues that they shared together also led towards a collective idea that they had in mind, and after consensus on the design was reached, they would start to make the pieces together as a group. Although not everyone would be part of the actual beading process, they would still sit together as a group and contribute in any way they could, be it through providing suggestions or simply just encouraging one another.

Figure 4.5: Collaborating to make a new design for hats and necklaces

It was also observed that they immediately tried to use the designs of the handicrafts and explore how it could be used in the creation of their own handicrafts. An example was when a community elder said that one of the traditional crafts of the community was a rattan hat that would be decorated with beadwork. The group then tried to incorporate the new designs into the design of the headwear, highlighting that they were keen on innovating their own handicraft as well while maintaining their own identity.

Figure 4.6: Collaboration among participants to create designs for handicraft

The participants stated that knowledge co-creation often came naturally to them, as it is a process of gathering together in a group and discussing their thoughts and ideas, as well as learning from the experiences of each other. Motivation to co-create knowledge at the telecentre was less compared to when undergoing the programme, as they stated that they could not see how they could contribute towards the building of the ICT literacy knowledge, whereas with the programme, they could build upon their prior knowledge and

use this to create new items and products. From this explanation by the participants, it was highlighted that motivation to co-create knowledge is very much dependent on whether or not the participant is able to **make meaning from the activity** and **work towards a joint goal with others.**

4.6 Observations Made

Throughout the workshops, observations on the behaviours and interactions among the community members were made, and notes were taken to highlight if these observations were supportive of the themes that had been identified through the interviews with the community members. Selected narratives and observations made to support these narratives have been highlighted in Table 4.45 below.

Table 4.45: Selected narratives and observations

Selected narratives	Selected observations	Selected identified themes and subthemes
BK US1: When we sit together and do this handicraft, it feels good. We can talk about our family, our old days, what we used to do as children. What our mothers told us. Sometimes it's different, what I know and what they know. So we share stories together when we do this new things together.	• Group of participants were engaged in conversation throughout the session • Ideas on how to make changes to the design would come out sporadically, and all participants would listen and weigh in on the idea together • Often exchanged stories about their past (seems to be more often, especially when there are outsiders listening in)	• Learning within the community • Knowledge sharing activities • Knowledge co-creation activities

Table 4.45 Continued

BA US3: Sometimes, I have nothing to share with them that will make the design nice or anything. But I still like to sit with them and talk. See what they do. Then I can also tell them what is nice and what I think they should change. We can argue also, but in the end, if the idea is good, and if it is easy to do, they will take my idea and do.	• Several participants in the session sit back and listen to others talking • Silent participants would occasionally point out designs to the others, offering suggestions • Participants often discuss how to use the materials provided, what design to make – shows that decisions are made collectively	• Learning within the community • Knowledge sharing activities Knowledge co-creation activities

4.7 Summary

Upon completion of the data analysis for all the phases of investigation for the current study, several observations were made in the findings, especially in terms of indigenous ways of learning and community priorities, which were further discussed in the following chapter.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Introduction

Having analysed the data derived from the documents and interview sessions from all phases, several salient observations were made with regards to (i) the implementation of the ICT literacy programme at the telecentre, (ii) the concerns and priorities that the indigenous communities placed on knowledge preservation, (iii) the extent to which the usage of indigenised instructional design methods could potentially increase motivation to share knowledge and co-create knowledge among the community members and (iv) the role that ICTs and the telecentre can potentially take on to bring about the sharing of traditional knowledge and the co-creation of knowledge within indigenous communities.

As these observations were in line with the research questions that the present study aimed to answer, the final chapter of this thesis discussed how the investigation has addressed all three research questions undertaken in this study, showing the merit of using an indigenised instructional model within the telecentre settings in order to strengthen knowledge sharing and knowledge co-creation among the users. Other findings that emerged during the interviews and the document data analysis phase, the contributions of this study, its limitations, and the implications for future research were also discussed in this chapter.

5.2 Research Question One

The first research question guiding this study was to what extent did the current instructional design model used at the telecentre motivate knowledge sharing and knowledge co-creation among the community members?

As earlier observed in Chapter 4, the implementation of the ICT literacy programme at the telecentre did not address areas concerning culture-specific assessments, culture-specific instructional strategies, and did not focus on content on cultural artefacts, history and knowledge. Especially in terms of the instructional design used and the method in which the trainings were delivered, it was noted that the training programme used the ADDIE model and did not specifically use any culturally-specific instructional strategies throughout the programme.

Investigation into the design of the ICT training programme revealed that the trainers had utilised the ADDIE model and Bloom's Taxonomy when designing the training modules for the telecentre users. The trainers also informed the researcher that they had not considered indigenous ways of learning or indigenous instructional strategies during the module design phase, sharing that they felt that more could have been done in terms of ensuring that the content and delivery of the trainings would be more meaningful and suited to the learning needs of the community members.

As the objective of the project was to introduce ICTs to these indigenous communities, it is not unexpected that they would not address these topics during the rollout of the trainings at the telecentres. However, this could have had a detrimental effect on the project, as it could affect the interest and motivation of the users to follow the trainings or to further develop the content of the training. Especially when considering that

the community members had expressed that they were more familiar with learning through observation and through close social interaction in settings that were more informal and relaxed, it can be inferred that the layout and design of the ICT literacy programme were not entirely conducive in motivating the users to partake in knowledge sharing and knowledge co-creation activities.

The information gained during the interviews with the trainers also corroborated with what was found in both the document data provided by the trainer team and the publications on the ICT training programme, indicating that the choice of instructional design and the design of the training modules could have been approached differently in order to achieve more sustainable and meaningful learning for the community members. As was mentioned by the trainers, there was potential in using indigenous ways of learning during the training sessions, which supports the objective of the current research.

Responses from the participants of the ICT literacy training from two of the research sites indicated that their enthusiasm for the training was mainly because they were learning about something new to them, and they were able to communicate efficiently with their family and friends rather than of them sharing knowledge and co-creating knowledge. The respondents from the two sites had also indicated that they did not feel particularly inclined to engage in knowledge sharing or knowledge co-creation activities unless specifically asked to do so.

Contrastingly, the responses from the third site differed in this aspect, as they informed the researcher that there were many instances whereby they shared knowledge and co-created knowledge with one another. Further inquiry revealed that the reason for this difference was due to the fact that the telecentre users at the third site had engaged in

indigenous ways and strategies of learning outside of the scheduled learning sessions at the telecentre, and this was not carried out at the other two telecentre sites. The users from these two sites had also shared that they do engage in knowledge sharing and knowledge co-creation activities outside of the telecentre and would be especially motivated to do so when they had discussions with one another or when they were learning about new things from one another as a group and in informal settings, as compared to being in a formal learning setting.

From the conversations had with the respondents during the interviews, it was realised that they could benefit more from a learning environment that was more catered towards their needs as indigenous learners, rather than one that suited more formal settings.

Satisfaction from the ICT literacy training stemmed from the experiences of learning new things, as respondents stated that they were excited about learning and understanding new things, hence fulfilling their pleasure in learning and understanding something new. In other words, their satisfaction with the telecentre could translate to the fulfilment of their intrinsic motivation to know. However, not all the respondents had expressed the same sentiments, as it was also found that despite the enthusiasm by the community members in eBa'Kelalan with regards to having a telecentre in their village, their responses to the ICT literacy programmes were rather lukewarm. Even when the telecentre managers had changed the delivery method from being a more formal training style to one that was more hands-on and catered for individuals, the participation from the community members was not as expected. Later on, it was revealed that the reason for the relatively lower participation from the elders at Ba'Kelalan was due to the fact that they had limited literacy skills, and they did not think that the ICT literacy training would be

something that they would need to learn or know. Their feedback suggests ammotivation to use the telecentre by some community members, as they did not show any interest in the telecentre and the promises that ICTs and the Internet brought, mainly because they could not relate to what was seen as a formal learning session which required high levels of literacy and understanding. Although the contents of the modules were translated into Bahasa Malaysia and, at times, into their own native languages, they felt that the younger generation would benefit more from using the Internet, and they would have nothing to contribute towards this learning experience as they could not relate the training with their daily lives.

The statements made by the respondents here highlight two important considerations that should be made when planning trainings for indigenous users, namely (i) the learning needs and styles of the users and (ii) relevance of the content to the users. Although one can argue that ICT literacy programmes might not be entirely relevant to the daily lives of the users because of the nature of the content that should be delivered, there are advocates suggesting that ICTs and the delivery of this can be adapted to meet with the needs of the users. An example of this is the eBorneo Knowledge Fair (eBKF). eBKF is an unconference held every two years in the highlands of Sarawak, and showcases how ICTs can be used for development in remote and rural areas, particularly those inhabited by indigenous communities (ISITI, 2019). There is a need to look at how both worlds can be reconciled to create an ideal setting for indigenous users, such as through the implementation of an indigenised instructional model at the telecentres. In the words of a respondent in Ba'Kelalan, the courses need to be catered to the needs (of the community) or that are related to the village, especially for those in rural areas.

The responses elicited from the respondents also suggested that they were more prone towards knowledge sharing and knowledge co-creation activities when they were in learning environments familiar to them and when using indigenous ways of teaching and learning such as through discussions and observations. As this was not the way the ICT literacy trainings were delivered to the participants at the telecentre, it was then surmised that the existing instructional design model used at the telecentre did not particularly motivate knowledge sharing and knowledge co-creation among the community members.

One salient observation was that they also shared that there were other factors that could have contributed towards their lack of motivation to share knowledge and co-create knowledge at the telecentre. The respondents stated that there were aspects to the training that they felt could have been better improved, one of this being technical support, which was somewhat a point of frustration for them. Users at the telecentre stated that they wanted to use the facilities but could not do so because they did not know how to solve the technical issues faced, as this was not part of the ICT literacy training that was given to them. Their frustrations also seemed to lead towards a demotivation to use the telecentre, as it seemed to them that they could not move forward without the project team's help, which affected their sense of accomplishment. As the users had expressed their interest in learning about these technical aspects of telecentre maintenance, it could be seen that this interest could later translate towards a heightened motivation to share their knowledge with other community members on how to solve these technical issues at the telecentre.

5.2.1 Motivation to Share Knowledge

Reflections made by the participants of the training at both eBario and eBa'Kelalan also showed that there was no clear indication that the respondents were highly motivated

to share knowledge and co-create knowledge at the telecentre. Some of the responses recorded from the participants showed that they would do what they were asked to do at the telecentre and would only go back and do it again if necessary or if they needed to do it, and they did not feel like they had to teach the others as the trainers would be there for them to ask. If at all they did share what they learnt at the telecentre, it would be if they were specifically asked by other community members to do so. However, they did express that they participated in these activities outside of the telecentre. When queried on the situations where they did take part in these activities, the respondents stated that they mostly shared knowledge during community meetings, when they were attending church, or when they learn something new that would be of interest to others. As for knowledge co-creation, the community members stated that this happened naturally to them and that they did not realise that they were co-creating knowledge. According to them, they do things together, learn from each other because this is their way of life. The responses elicited from the community members at this point of the study suggest that their motivation to share knowledge and co-create knowledge is intrinsically driven, which suits the goal of the present study to investigate the conditions that would support intrinsic motivation to share knowledge and co-create knowledge at the telecentre.

Another salient observation made from the responses by the respondents from both eBario and eBa'Kelalan was their desire to have extra discussions with more people. The expression made by the users indicates that they are keen on participating in social activities that would stimulate their telecentre experiences. In this aspect, it can be surmised that this stimulation would be invoked through discussion and exchanges with both the users and other people, bringing this back to their responses regarding how they learnt as a community. Through these exchanges, the researcher was able to find out more

about the learning styles and practices of the community and how they take in information and make it meaningful for them. It was noted that one important aspect of learning for the community is that it is a social event and is passed on through constant repetition and guidance from an elder to the younger generation. Their learning happens gradually over time and practice, and in natural settings, as opposed to learning in a classroom setting, and within a set schedule, with little room for discussion and social interaction. By understanding this, the researcher was able to draw distinctions between how the community learns and the delivery methods of the training sessions at the telecentre and further understand the importance of including community members in different roles when executing learning activities telecentre.

Aside from that, there was one statement made by a respondent that left a lasting impression on the researcher, which was “knowledge must be shared, and we must use it for good things”. The statement made points towards a motivation to share information and the feeling of satisfaction that they would derive from doing so. Based on their reasons for wanting to share their knowledge, it can be surmised that there is a sense of pleasure and accomplishment when they see that their knowledge is being passed on to others and seeing others benefitting and growing from that knowledge. The respondents had also shared that they were highly motivated to share their knowledge as long as they have the opportunity and platform to do so, indicating that they experienced a sense of satisfaction, accomplishment, and excitement to learn new things and share what they learned with others. Apart from that, they were also keen on being content contributors by sharing their existing knowledge with others. However, this was not seen to happen during their learning experiences at the telecentre, which again goes back to the question of why did this not happen at the telecentres of Bario and Ba’Kelalan? The next question asked by the

researcher at this point in time was if the same experiences would be shared by the users at eLamai.

Interestingly enough, this was not exactly the case with the participants from eLamai. In fact, the respondents shared that they had conducted many knowledge sharing and knowledge co-creation activities with one another and had displayed a relatively higher motivation to do so. Despite undergoing the same content materials, the different responses prompted the researcher to investigate deeper with the respondents from the third site in order to find out why there was this difference. Further investigation revealed that one of the main reasons why they were more motivated to do so was because they would have separate discussions and sharing sessions among the community members themselves as well as with the trainers when they were on site. Areas of discussion would involve topics and subjects that they learnt at the telecentre. A respondent shared that the reason why they first began these group learning sessions was because not everyone was able to follow and understand the training from the beginning, and therefore, the younger members took it upon themselves to tutor the elders who were interested in learning. However, what initially started as a tutoring session soon became a community activity, as they started to engage in their community way of learning through discussion, interaction and together as a group instead of individually or in teams of two with the trainers.

They were also able to share their thoughts and worries about the training, and these sessions encouraged them to root each other on, and come up with solutions or methods to ease their learning. One of the ways that they used was to initiate the translation of the manuals into their native language, and to contextualise the content to their everyday lives, so as to make it more relatable to them. As was informed by the

respondents in the interviews, the community emphasised on learning together in a group, where there was always room for exchanges and discussion among one another. Other observations made with this group of respondents include:

1. Learning through socialisation – their learning was more effective when it was done together, and they felt motivated when everyone supported each other (sharing sessions with the trainers)
2. Want to improve, build, and develop skills, abilities and experiences
3. Face-to-face interaction and trainings should be conducted by locals
4. Community members were all very eager to learn
5. Sense of loss without telecentre - telecentre was a source of motivation to learn together as a community
6. Learning together as a community

Based on the feedback from the respondents, it was observed that knowledge sharing and knowledge co-creation occurred when the participants took their learning out of the classroom and into the community and engaged in their own traditional ways of learning. By injecting community ways of learning into their experiences, the community displayed more active participation to share knowledge and co-create knowledge, suggesting that an instructional design that is culturally inclusive could potentially strengthen motivation to do so among community members. Advocates for cultural inclusion into instructional design such as Thomas et al. (2002), and Young (2009) have remarked that including culture as a dimension into the ADDIE model leads towards a strengthened instructional design process, and subsequently, an improved instructional design.

The comments made by the participants from eLamai and their personal experiences at the telecentre reflect the observations and reflections made by the trainers when they shared their thoughts about the training sessions and on what they felt could have been further improved on or should have been done when the trainings were deployed. Observations made by the trainer team which highlighted the need to learn more about the literacy and competency skills of the community members, the need for content to be tailored to their needs and interests, and to design modules that were more community-centric further supports what has been reported in the literature with regards to the need to contextualise instructional design and to make it more culturally inclusive so as to suit the needs of the communities. (Henderson, 1996; McLoughlin & Oliver, 2000; Young, 2009). Also, their reflections highlighted that cultural and indigenous ways of teaching and learning were not addressed in the trainings, hence further supporting the argument that an indigenised instructional design would contribute towards a more meaningful learning experience for the community members.

Apart from that, the knowledge co-creation that happened at the research sites is reflective of the findings by Nonaka and Takeuchi (1994), who posited the four mechanisms of knowledge co-creation, namely socialisation, combination, externalisation and internalisation. These four mechanisms were seen through the interactions and the passing down of knowledge from the experts in the community to the other community members, and when they made use of the knowledge learnt to create new designs for the handicrafts, showing that the externalisation mechanism was in play. As the community members continued to work on their pieces using the skills and knowledge gained from other experts of the community with one another, they began to internalise the knowledge,

to the point that they were able to use their new knowledge and pass it to others, acting as experts as well.

Therefore, in terms of the extent to which knowledge sharing and knowledge co-creation occurred at the telecentre, it was surmised that the existing instructional design implemented at the telecentres was not particularly conducive for this purpose, according to the experiences relayed by the participants. The one telecentre that reported knowledge sharing and knowledge co-creation activities had done so only after they partook in community sharing sessions with one another; therefore, indicating that this too would not have happened if not for that.

Considering the feedback received from the respondents as well as members of the project team, it was therefore identified that the participants could have benefitted from a training session that had a more culturally inclusive delivery, bringing us to the second research question guiding the present study: to what extent can an indigenised instructional design used in learning programmes at the telecentre motivate knowledge sharing and knowledge co-creation among the community members?

5.3 Research Question Two

The second question guiding this study asked was how can an indigenised instructional design used in learning programmes at the telecentre motivate knowledge sharing and knowledge co-creation among indigenous community members?

Before discussing how the use of an indigenised instructional design could potentially increase motivation to share knowledge and co-create knowledge amongst the community members, it was first important to understand what the desires and priorities of

the communities themselves were. Of all the interview feedback collected from the three sites, several recurrent desires or intentions were raised by the community, which were:

1. Training should meet with their needs;
2. The desire for the younger generation to learn about their history, their handicrafts, their ways of life;
3. The importance of knowledge preservation;
4. Becoming trainers and creators of content that was relevant to the community; and
5. Sharing what they know with others

Perceptions from the participants showed that there could be an increased motivation to participate in knowledge sharing and knowledge co-creation if the following was included in the initial rollout. An example of the responses from the participants and how they are motivated to learn, share knowledge and co-create knowledge based on these three cultural components is tabled in Table 5.1.

Motivation of the participants was seen to be strengthened when the three cultural elements were present. For instance, in terms of their motivation to learn, the enthusiasm shown by the respondents was higher when they were given the opportunity to learn about other cultures and issues that were important to them, as well as when they could learn from other people, add on to their existing knowledge and exchange knowledge with others.

Table 5.1: Participant responses

Components	Motivation to learn	Motivation to share knowledge	Motivation to co-create knowledge
Cultural artefacts (handicrafts, games, stories)	***Learn more about other cultures**, to **know more about what others are doing***	***We can share, learn from their knowledge** to implement here. Then **we can also share our knowledge with them**.*	*We used to sit around together and discuss our handicrafts, and they would tell me how they did it. And I would learn from them; **it was fun to have sessions like that together**. I would look forward to our tea time together.*
Cultural history (education, the way they learn within the community, delivery, priorities, meaning of learning)	*We are all eager to learn. We **can learn anything** if we have the opportunity.* *We should **learn more to add on to what we already know**, to make us more skilled and refine our talents.* *It is all based on our **own efforts** and **how much we want to learn**. And **how much efforts we put in to master it***	***We taught them, as a community**. **Now, we can teach them all sorts of things so that they have an understanding about what they need to learn.*** *Books **that we ourselves make to teach people how to use**, the steps involved.* ***Sharing knowledge.. That is how we learn, as a community, from each other***	*Maybe if we have **extra sessions with more people**, or if we can have **discussions**.* ***They would start practicing at home** with the 1Malaysia laptop. So, they would **ask their children or grandchildren to help them.***

Table 5.1 Continued

Cultural knowledge (exchange and sharing of knowledge, preservation of knowledge)	***Maybe if I see what they do, I will also know how to do.*** ***Connecting with people*** *through the Internet, and* ***learning about topics and issues*** *pertaining to health and livelihood.* ***If we know how to use the facilities, there are a lot of benefits****.*	***It should be shared*** *so that* ***we can all benefit from it. That's why I want to share what I know with others****, especially my family.* *If we can* ***be trainers ourselves*** *we would want to do that. I am sure we can teach others if it is about our daily lives, or something that we are good at.*	*We* ***enjoy sharing knowledge*** *with one another. We do it because* ***it makes us feel good, not because we want to gain anything (monetary) from it.*** ***Being together, and having sharing sessions****. This is what I remember the most, because we always do that. Sharing experiences.* ***Even older people would join.*** *I mean older people like our grandparents, they would join.* ***They liked it.***

They also expressed greater motivation to share knowledge and co-create knowledge when the topics were of interest to them and bore special meaning, such as their traditional knowledge and the preservation of this knowledge. Motivation of the participants was also seen to be stronger when they were engaged in activities that used indigenous strategies of learning, such as through close discussion, learning from the experts in the community as well as when they felt that they were contributing to the knowledge and sharing information that would bring benefits to others.

The enthusiasm shown by the community members was more apparent when they were engaging in the community-led learning programme compared to the ICT literacy training, as the users had shared that when they were involved with the ICT literacy training programme, their excitement leaned more towards them learning about something new and how to communicate with their family and friends more efficiently. They had expressed that they did not think it was necessary for them to share what they learned at the telecentre with others unless they were asked to do so specifically. Conversely, they felt that they were more invested with the programme as the delivery of the programme resonated more with their desires and priorities of the community.

The identification of the desires and priorities of the community was essential to ascertain what should be done to ensure that the community members would be interested in participating in the learning activities at the telecentre. As highlighted earlier, the injection of cultural needs and priorities, as well as the inclusion of a cultural dimension, could potentially strengthen motivation to share knowledge and co-create knowledge. In order to achieve this, there is a need to relook at the delivery of the trainings, and the inclusion of both culture-specific instructional strategies and culture-specific assessments,

as both these aspects were not emphasised on in the initial instructional design at the telecentre.

5.3.1 Delivery of Training: Culture-specific Instructional Strategies

Young (2009) defines culture-specific instructional strategies as strategies that are specialised to a particular individual or group that take into consideration how the target audience learns and the best way of approaching this learning. In the cases of the communities at Bario, Ba'Kelalan, and Long Lamai, it was found out that these communities are accustomed to learning in a social context and in informal settings. The community at Long Lamai clearly showcased this, as the usage of culture-specific instructional strategies that the community members were accustomed such as group discussions on topics learnt, sessions to share their thoughts and feelings, as well as the effort put forth to guide one another through the extra training sessions held with one another, was one of the key reasons why they were more motivated to share knowledge and co-create knowledge with one another. By injecting community ways of learning into their user experiences with the telecentre, the community members showed stronger motivation to participate in knowledge sharing and co-creation activities. The comments made by the respondents also highlight their strengthened motivation to share and co-create knowledge after using a community approach to their learning experiences.

The desire to have these types of social interactions was also highlighted during the interview sessions with the community members at Bario and Ba'Kelalan, although this was not done at the time. The interviews with the community members revealed that they wanted to have training sessions conducted in ways that were familiar to them, such as more social-based settings and face-to-face interaction between the trainers and the

participants. Another statement made by a respondent at the telecentre was, “If I see what they do, then I will also know how to do”. The statement made by the respondent infers learning through observation, which has been detailed as a way of learning within the community. The response also indicates that if indigenous ways of learning were used at the telecentre, this could encourage community members to become more active using the telecentre. The statement also suggests that intrinsic motivation to know was triggered by what was observed at the telecentre, as the respondent expressed curiosity and an interest in learning to do what the other person was doing at the telecentre.

One of the aspects highlighted by community members was that they preferred trainings to be conducted in their own native dialects and to have content that was contextualised to their lives so that they could relate to the material in more detail and make use of the knowledge in their daily lives. Apart from that, the respondents also mentioned that if they had more opportunities for the community to practice what they learnt together, it would have given them a more meaningful experience as they would be able to share their ideas and thoughts with one another during these sessions; hence increasing the possibility of them partaking in knowledge sharing and knowledge co-creation activities.

In terms of motivating knowledge sharing at the telecentre, the respondents mentioned that they would be more inclined to participate in these activities if the training was more catered towards their interests and were delivered in a way that was easier for them to understand. As for knowledge co-creation at the telecentre, they stated that they would want to participate in activities that involved more creation from them, instead of just being recipients of knowledge. When queried further about being creators of

knowledge, the respondents stated that they wanted to learn from one another and other people, as well as let others learn from them, showing that the participants felt a stronger interest in knowledge co-creation here.

The comments made by the respondents were also observed by the researcher during the sessions with the respondents, who displayed active participation with one another during the community-led learning programme. As they were the creators of the content, they were more involved in the teaching and learning process, injecting aspects of their own community learning during the programme, such as using their own language to communicate with one another, coming up with topics that were of interest to themselves, and the strong emphasis on indigenous knowledge preservation. They were also highly engaged in social interaction with one another, and during these sessions the researcher was able to observe the nuances and dynamics of their own ways of learning, sharing of knowledge and the processes involved during the co-creation of knowledge. These observations were also reflective of their own responses during the interview sessions, showing that the injection of the components that made up the proposed indigenised instructional design model was indeed capable of strengthening their motivation to share and co-create knowledge.

Again, building on what was done at Long Lamai and what was expressed by the participants at Bario and Ba'Kelalan, it was surmised that if an instructional design that takes into consideration the ways of learning and teaching that the community members were familiar with, an ideal instructional design for the communities could be developed.

5.3.2 Delivery of Training: Culture-specific Assessments

According to Young (2009), culture-specific assessments emphasise on the needs of the target audience through culturally aligned content and the content of the assessment is specific to the frame of reference of the target audience. As these forms of assessments can be used instead of generic assessments, a wide range of aspects that are creative in nature and not tied to traditional evaluations can also be included in the evaluation process.

An important finding from these interview sessions was that the participants felt that other ways of assessing their competencies would have been more useful, as not all the users can undergo traditional forms of assessments due to their limited literacy skills. Their limited literacy skills were also another reason for them to not join the ICT literacy skills as they felt that they would not be able to benefit or contribute towards these sessions. Culture-specific assessments are needed in these communities mainly because many participants have indicated that they are unable to take part in assessments that require higher levels of literacy. Language was considered a significant barrier, especially if the assessments were done in English or even in Bahasa Malaysia, as the respondents had also indicated that they were more comfortable with the use of their own indigenous languages.

By using culture-specific assessments, a wider pool of participants will be able to demonstrate their capacities and capabilities, as compared to using traditional forms of evaluations, such as short answers or multiple-choice questions. An example of this was showcased during the physical observations done during the community-led learning programme, whereby one of the assessments was in the form of producing handicrafts similar to what was taught to them. Not only were the participants eager to recreate the pieces and infuse their own designs and styles into the handicrafts, but they were also keen

on producing more videos to share with others. The numerous discussions they had with one another to decide on the design of the pieces also indicated a heightened motivation to co-create knowledge amongst themselves, showing that if culture-specific assessments are used in the instructional design, the participants could potentially be more motivated to participate as well as share knowledge and co-create knowledge.

5.3.3 Indigenous Knowledge Preservation: Focus on Cultural Artefacts, History and Knowledge

Cultural artefacts refer to items that have been produced by a member of the culture, or found in a cultural environment that might be examined to provide information about that culture (Young, 2009), whereas cultural history is described as a shared past of a culture, working to preserve the past, tell the stories of human beings, record information, and record a heritage (Young, 2009). On the other hand, cultural knowledge is defined to be what is known in a culture and is knowledge that is acquired, learned, translated, transferred, taught, recorded, documented, preserved, created, accessed, used, and applied (Young, 2009).

In the present study, the community members had expressed that they would have wanted the trainings to be more relevant to the community, especially in terms of content, as they were more concerned with aspects of knowledge preservation of their culture, tradition, history and the documentation of this knowledge. The respondents interviewed in this study were very passionate about their handicrafts (artefacts) and had emphasised on the importance of passing this knowledge down to the younger generations as their handicrafts are seen to be a part of their identities. Each design carries a special meaning, and the different beads and colours used for their art pieces are representative of their history and culture; therefore, there is a need to ensure that this knowledge is not lost. The

community members also expressed a keen interest in finding out about the cultural artefacts of other communities, as they saw this as an opportunity to learn and to further improve their skills and designs, indicating a strong intrinsic motivation to learn among the community members.

Aside from that, the participants were also eager for their history, stories and songs to be passed down to their younger generations, and had expressed an interest in sharing their knowledge in any way that they can in order to benefit their communities and the younger members of the community. They emphasised that there was a need to disseminate this knowledge among the youth, and if there was a platform that could enable this, they were more than willing to demonstrate their knowledge and document it for the use of future generations.

Their interest and motivation to do this is one of the main factors contributing towards their enthusiasm for the community-led programme, which saw the community members coming together to document their stories and knowledge digitally. The positive feedback from their family members who saw their products was also another factor that spurred them towards creating more videos for the community. Aside from that, as the delivery of the content was done entirely by the community members themselves, they were able to convey their messages in ways that were most familiar to them, allowing them to use their own ways of learning to pass down their knowledge in a way that was effective for them. Therefore, if an indigenised instructional design can capture these aspects of learning among the indigenous community members, then it can be seen that the motivation to participate, to share knowledge and to co-create knowledge would also be potentially higher.

5.4 Designing an Indigenised Instructional Design

Based on the observations and feedback received from the interviews conducted with the respondents, it was found that there was value in using an indigenised instructional design when conducting learning programmes with indigenous communities. However, in order to determine the true value of an indigenised instructional design, feedback had to be collected from respondents who had experienced learning programmes that had used such a design. In the present study, it was suggested that the community-led learning programme conducted with the participants was reflective of such an instructional design. The introduction of the programme at the research sites elicited some insight on the efficacy and merit of using an indigenised instructional design when rolling out learning programmes with indigenous communities. As the two sites chosen were also research sites during the telecentre project, and the participants for the second stage of interviews came from the same pool of respondents who had participated in the first stage of inquiry, their responses towards the programme were useful indicators of the value of using an indigenised instructional design.

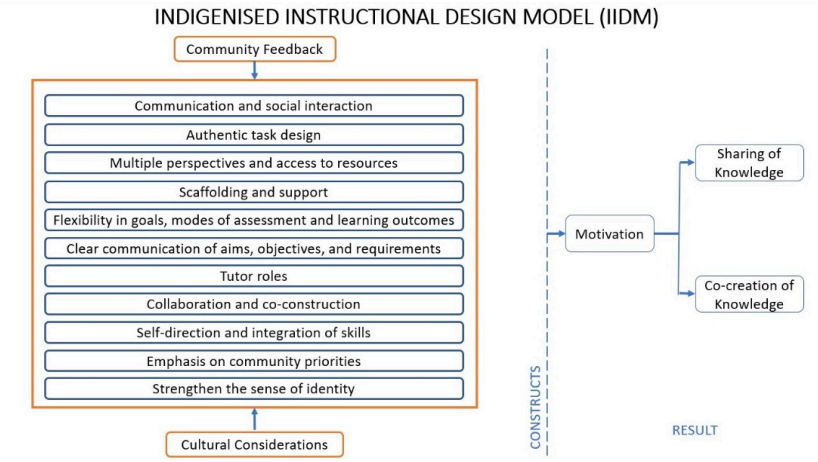

Figure 5.1: Proposed indigenised instructional design model

From the findings, a conceptual framework for an indigenised instructional design model was conceptualised. The framework looked at using community feedback together with cultural considerations, as well as several selected requirements and how this could potentially lead towards a greater motivation to share and co-create knowledge at the telecentres.

5.4.1 Comparison between the ICT Literacy Training and Community-led Learning Programme

Using the aspects identified by the respondents on what they felt could have been improved during the programmes rolled out at the telecentre, a comparison between the ICT literacy training conducted at the telecentre and the community-led learning programme was performed to determine which of the two learning programmes done at the research sites reflected the community members' learning needs and priorities.

Table 5.2: Design factors in the Elements component

Aspects raised by community members	**ICT literacy training**	**Community-led learning programme**
Usage of different ICT formats for **knowledge preservation**		√
Content **focusing on** their **indigenous culture**		√
Content **delivered in** own **indigenous language**	√	√
Product to meet with their own **priorities (knowledge preservation)**		√
Activities that would **improve, build, and develop skills, abilities, and experiences**	√	√
Delivery of content using **community ways of learning** (social interaction, discussion, observation)		√

Table 5.2 Continued

Content that can be **shared with other people** and bring benefits to the community	√	√
Content that is **customised to their needs and interests**		√
Content that can **encourage indigenous knowledge preservation** and **strengthen the sense of identity** within the community		√
Ways to **disseminate knowledge to the younger generation**		√

Based on the table above, it could be seen that the learning programme had addressed all the aspects highlighted by the community members. Feedback collected from the participants on their satisfaction with their experiences using the community-led learning programme indicated that the participants showed a higher interest and motivation to share knowledge and co-create knowledge when they were participating in the programme. Evidence of this can be seen through their exchanges throughout the phases of the project, as well as from the observations made by the researcher and the community liaison.

Considering the focus of the current study, it was then pertinent to determine if the programme represents an indigenised instructional design. An adapted selection of requirements based on prior studies detailed by Henderson (1996), McLoughlin & Oliver (2001), and Young (2009) was used in this study to identify key components for an indigenised instructional design that would be suitable to be used with the indigenous communities. The selection of the requirements was also based on the feedback received from the respondents of this study.

Table 5.3: Adapted selection of requirements for indigenised instructional design

No	Requirement	Source
1	Awareness of learner needs and preferences	McLoughlin & Oliver, Indigenous community
2	Include multiple cultural ways of learning and teaching	Henderson, McLoughlin & Oliver, Indigenous community
3	Communication and social interaction	McLoughlin & Oliver, Indigenous community
4	Authentic task design	McLoughlin & Oliver, Indigenous community
5	Multiple perspectives and access to resources	McLoughlin & Oliver, Indigenous community
6	Scaffolding and support	McLoughlin & Oliver, Indigenous community
7	Flexibility in goals, modes of assessment and learning outcomes	McLoughlin & Oliver, Henderson, Indigenous community
8	Tutor roles	McLoughlin & Oliver, Indigenous community
9	Collaboration and co-construction	McLoughlin & Oliver, Indigenous community
10	Clear communication of aims, objectives, and requirements	McLoughlin & Oliver, Henderson
11	Self-direction and integration of skills	McLoughlin & Oliver
12	Emphasis on community priorities (e.g. indigenous knowledge preservation)	Indigenous community
13	Strengthen the sense of identity	Indigenous community

Using this adapted selection of requirements, an analysis of the community-led learning programme was conducted in order to determine that the programme was representative of an indigenised instructional design.

Table 5.4: Analysis of Community-led learning programme according to adapted selection of requirements

No	Requirement	Community-led learning programme
1	Awareness of learner needs and preferences	Considerations of cultural context - language of training in own language, content decided by community on what they wanted to share, delivery of the training was based on their own narratives and how they would teach others in their community Trainers adapt sessions to suit the learning levels of the learners, modify content of modules - changes from initial plan to run the programmes with pre-determined content, to one that would suit the needs of the community. Content was based on what the community wanted to share
2	Include multiple cultural ways of learning and teaching	Community elders acted as instructors for the modules - no specific instructional design used, but rather depended on how the community saw it fit to share their knowledge with others. Focus was on the way the community learns together and how they can share knowledge with one another Learning and teaching through narratives, observation

Table 5.4 Continued

3	Communication and social interaction	Database of feedback of the target audience's interactions with the product - discussion forum on the platform
4	Authentic task design	Tasks for the community were based on community designed modules, participants were asked to
5	Multiple perspectives and access to resources	Content created by community trainers after discussions with participants on what they wanted to showcase. Storyboarding and recording of content also completed with input by community
6	Scaffolding and support	Progress monitored through follow-up workshops, feedback platform forum, production of videos and content Relationship between trainers and community members was positive, with appointed CLs acting as liaison between community and project team
7	Flexibility in goals, modes of assessment and learning outcomes	Internal evaluations- provided learners with opportunities to check their work and reinforce skills and knowledge - learners provided with multiple opportunities to be successful and master the skills needed Specialised evaluations - making of videos and documenting the process, telling the story, with the purpose of sharing it with others

Table 5.4 Continued

8	Tutor roles	Mentors for technical support came from project team, mentors on content and tasks were community members. Feedback and support was communicated between community members and project team. Meetings and workshops organised whenever project team was able to enter site, hence any requests or need for support was given during these times
9	Collaboration and co-construction	Tasks were designed for community members to collaborate with one another during the creation of content, as well as when carrying out tasks based on videos made by other communities. Sharing and co-creation of ideas occurred during workshops, and community discussions while working on tasks
10	Clear communication of aims, objectives, and requirements	Indication of differentiating opportunities to learn, empowering and engaging learners, culture specific instructional strategies, enrichment of instructional content, enculturating the learner
11	Self-direction and integration of skills	Multiple pathways to improve, build, or develop skills, abilities, and experiences - through the knowledge sharing, workshops and discussions, as well as learning from other communities to further develop their skills and knowledge
12	Emphasis on community priorities (e.g. indigenous knowledge preservation)	Culture was used as basis for the design of the programme, with an emphasis on cultural artifacts, cultural history and cultural knowledge
13	Strengthen the sense of identity	Focus was on modules catered to the culture of the communities involved, and was shared with the community members and their families. Feedback from family members showed that there was a sense of pride and renewed interest in attempting the tasks showcased in the videos.

From Table 5.4, it was shown that the programme was reflective of an indigenised instructional design, in that the programme addressed all of the identified requirements proposed for an indigenised instructional design to be used with the community members. Based on this observation, it could be seen that the programme could potentially be used as a guideline to influence the motivation of indigenous communities to share knowledge and co-create knowledge. In order to ascertain this, key findings in the previous chapter are situated within the existing literature on culturally inclusive instructional design and self-determination theory (SDT) and the extent to which the indigenised instructional design afforded the participants a different quality of experience than the current instructional design used at the telecentre is considered.

5.4.2 Strengthening Motivation Through the Use of an Indigenised Instructional Design

Deci and Ryan (2000) report that intrinsic motivation can be strengthened when three psychological needs are satisfied: (i) autonomy, (ii) competence, and (iii) relatedness. The following section will examine how indigenised instructional design supports these three psychological needs and will relate these to the findings of the study.

5.4.2.1 Indigenised Instructional Design in Supporting Autonomy

According to SDT, autonomy is achieved when individuals feel that they can affect their own future, with empirical studies showing that communities may feel more autonomy when they voluntarily engage in a project that they believe is **consistent with their values** (Ryan & Deci, 2000). Study findings showed that the community members were willing to voluntarily engage with both projects as the objectives of the project presented to them were in line with the values that the communities had towards learning

and further development of the community. The participants of the programmes also described that the project team had approached the community to first discuss the project with the community leaders, elders and the community members, and this represented to them that the project team was sincere about bringing them something for the benefits of the community, which is consistent with their values of prioritising learning that would benefit the whole community.

The participants of the programme described feeling an increased sense of ownership and control over their learning experiences with the programme as compared to the ICT literacy training, as they were very involved in the development process of the courses. The respondents indicated that they believed that they benefitted from this autonomy as it allowed them to pursue topics of their interests and which held special meanings to them. The process involved in creating the learning activities also allowed them to experience making decisions about teaching and learning. Apart from that, they also stated that they began to take the initiative on planning the content of the courses as they were the experts of the subject. Suggestions thrown out to the community and the team were often accepted or discussed with one another until a consensus was reached, which also contributed to a stronger feeling of ownership over the programme.

5.4.2.2 Indigenised Instructional Design in Supporting Competence

Ryan and Deci (2020) describe competence to concern the feeling of mastery, where individuals sense that one can succeed and grow. It was also noted that the "need for competence is best satisfied within well-structured environments that afford optimal challenges, positive feedback, and opportunities for growth".

One key aspect of both the ICT literacy training at the telecentre and the programme is that both programmes are aimed at increasing the competence of the community members. With the training programme, it was expected that the community members would achieve ICT literacy skills, whereas with the community-led learning programme, the competencies that the project aimed at developing skills as trainers of the programme, and preservation of indigenous knowledge. ICT literacy skills were fostered as the community members learnt how to document their videos and share them via online and social media platforms.

While both projects did see success with increasing the targeted competencies of the users, the responses from the community indicate that they experienced higher feelings of competence when they were participating in the community-led learning programme as compared to the ICT literacy trainings. Most participants suggested that they felt competent when they were able to plan and produce a video that would be shared with other people as training material, as it made them feel a sense of achievement. Recognition as a teacher or trainer also contributed to this feeling of competence, as they had always associated the terms ‘teacher’ or ‘trainer’ with individuals who had higher degrees of education and that before this programme, they did not see themselves in this light. The participants also felt that they were given the opportunity to grow with the programme as they were learning how to create content, and at the same time, learning about other cultures and communities through the videos, indicating here that the programme afforded the participants with the chance for personal growth in terms of knowledge and skills.

Positive feedback and communications received from the community, family members, friends, and the project team also contributed to their feelings of competence, as

they perceived this feedback as recognition of their work. Some participants also stated that the positive feedback received spurred them on towards becoming more excited to create more content, as they now knew how to do so.

5.4.2.3 Indigenised Instructional Design in Supporting Relatedness

According to Ryan and Deci (2020), relatedness concerns a sense of belonging and connection, which is facilitated by the conveyance of respect and caring. The participants stated that they perceived a general sense of relatedness with their peers, family members and the project team when they were taking part in the community-led learning programme. These feelings of relatedness manifested in several ways, with some participants likening these relationships with the project team with that of a family. Explanations of this likening showed that the community members felt that the project team came in with genuine intentions of bringing benefits to them, and treated them with respect and care as they did not undermine their opinions and thoughts. They also felt that the project team must care for their wellbeing, otherwise they would not keep coming back with opportunities for the community.

There were also feelings of relatedness with their peers, both within their own communities as well as from the other communities participating in the programme. Some participants suggested that they felt connected with their peers through the sharing of knowledge on their interests and indigenous knowledge. However, they did express a slight regret that they would probably not be able to meet with the other participants face to face due to geographical constraints; however, they were glad that through the exchange of videos with one another, they were able to form some sort of connection with them. Their social interaction with one another through videos also acted as a form of motivation for

them to continue to create more content, as they felt that they were communicating with one another through this method. Aside from that, the community members also expressed that they felt a renewed connection with their family members who were not residing in the village with them, as their grandchildren were watching their videos and telling them that they would experiment and create the same products that was demonstrated in their videos. The feedback received also motivated them to continue to participate in the programme as they felt that through this platform, they were able to show care for their family members through the passing down of their stories and skills, suggesting here that an indigenised instructional design was capable of supporting relatedness for indigenous communities.

While general trends emerged in the participants' perceptions of their autonomy, competence, and relatedness during the implementation of the community-led learning programme, it is important to note that the extent to which their basic psychological needs were met with was dependant on the individual community member. For example, while most participants perceived a larger sense of freedom when deciding on the content of the programme, there were some that were happy to follow the general consensus, stating that they were alright with the choices that the others made, as they did not have any other better suggestion, or that the others had already stated out what they were thinking of. Such a case suggests that participants' perceptions of their autonomy, competence, and relatedness varied depending on the individual, however, there were no indications that any of the participants felt that their feelings of autonomy, competence, and relatedness were considerably undermined.

5.4.2.4 Indigenised Instructional Design in Supporting Intrinsic Motivation

One question that this study sought to answer was: Would an indigenised instructional design model motivate knowledge sharing and knowledge co-creation at the telecentre? Intrinsic motivation is said to be apparent when all three psychological needs are met with (Deci & Ryan, 2000). In the case of the community-led learning programme, it was demonstrated that the programme was capable of supporting autonomy, competence and relatedness, therefore feelings of intrinsic motivation should be apparent among the indigenous community members.

Study findings suggested that the participants generally experienced that their feelings of curiosity, accomplishment, excitement, and fun were invoked while they were participating in the programme. The majority of the community members who took part in this study suggested that they were driven to engage in the activities by their innate interests and curiosity, and the enjoyment and excitement that they experienced while planning for and creating the content for a larger audience were particularly meaningful for them. The responses that they received for their efforts motivated them to engage in further activities, especially those concerning knowledge sharing and knowledge co-creation, as this was the main reason why they felt that they could contribute to the programme. The participants had also stated during their interviews that they felt happy when they shared knowledge with one another and that doing this gave them a sense of satisfaction. Now that they were able to engage in these activities on a larger scale and reach out to family members and friends that were far away, these knowledge sharing activities were much more meaningful to them. Throughout the programme, the participants did not specifically indicate that they experienced extrinsic motivation, stating that the reason why they share knowledge was not for monetary gain, but for the sense of happiness that they get when

they sit together and exchange what they know with one another. However, the participants did show that they were sometimes motivated by competition with their peers and a desire to impress community members; however, this could also be linked to their intrinsic desire for achievement. Through activities that required them to create products based on the videos shared by other communities, the participants were also motivated to co-create together to produce products that were similar to what they learned through the course but were unique enough to showcase their identity. The co-creation process also satisfied their intrinsic motivation to know more about other communities as well as their intrinsic motivation for accomplishment as they were able to produce the items required of them.

One key takeaway from this study was that the participants were motivated to participate in the community-led learning programme and were very excited when learning about the cultures of others and comparing notes about their traditions and cuisine with their own. The participants were also actively engaging in discussions during the activities, which is indicative that when indigenous ways of teaching, learning and sharing knowledge are in play, community members can be motivated to participate in learning activities.

5.5 Research Question Three

The final question that this study sought to answer was how can the telecentre support the learning needs of indigenous communities, especially as a platform for teaching and learning, knowledge sharing, and knowledge co-creation activities among indigenous communities?

In this respect, there is much that can be done at the telecentre to support the needs of the communities. As pointed out by numerous researchers (Evans, 2001; Oestmann &

Dymond, 2001; Mohd Noor & Kassim, 2007; Anand et al., 2012; Chew et al., 2013), these centres are still very relevant in underserved regions, especially in terms of providing these communities with a platform for their learning and training needs. UNESCO (2016) also identified that telecentres could be a hub for community members to develop their learning and skills, as well as to use technology for more than just obtaining information from the internet.

There is potential for telecentres to continue to take on the role as training centres for indigenous communities, both as a place for learning skills development programmes and also for learning community skills. As demonstrated in the current study, learning programmes could potentially draw communities together to participate in learning activities within the community. Motivation to participate in such activities can be increased with the use of an indigenised instructional design for the training programmes, and as demonstrated by the community-led learning programme, cultural considerations of indigenous communities throughout the planning, development and implementation phases of a project could also potentially gain community involvement from the users of the telecentre. The indicators highlighted by Chew et al. could also be addressed through the usage of a project design and the implementation of an indigenised instructional design similar to that of the learning programme organised at the research sites.

Apart from that, an area of concern that all three communities raised was the worry of the loss of their indigenous knowledge, as they revealed that more of the youth within their communities today were no longer interested in learning how to make their handicrafts and had little knowledge of their history and traditions. Some of the respondents also informed the researcher that they felt the need to use different methods to

reel back the interest among the younger generation, and one of them was the proposal of using ICTs. Considering that the telecentres are equipped with the necessary infrastructure to support ICTs, it is, therefore, appropriate to use these telecentres as centres for the documentation and creation of videos for the benefit of the community as well as others interested in learning more about these indigenous communities.

As seen during the implementation of the community-led programme, the digitisation of the knowledge was made possible through the use of ICTs, and the dissemination of these videos was done through the use of personal social media platforms and the learning platform. Although these activities were conducted outside of the telecentre, it does shed insight on the potential of using the telecentres for this purpose. As voiced out by the respondents themselves, they would rather use the facilities at the telecentre to document and digitise their knowledge, because they felt that the space at the telecentre was appropriate for this, and through the use of a communal space, it would mean that their productions would be owned collectively by the community, as compared to if it was done individually. Also, by doing these activities at the telecentre, the telecentre can also function as a knowledge centre, and is capable of supporting many other activities highlighted by the community members. UNESCO (2016) also stated that this is the future of the telecentre, hence, the role of the telecentre to support these activities is great.

The indigenous communities at the telecentre sites in Sarawak had also stated that the telecentres still remain very relevant to them and have expressed a sense of loss when the telecentre ceased operations at their villages. By using the telecentre as a space for conducting learning activities, community members are given the chance to revive the sense of togetherness they felt when using the telecentre when it was first established.

Community members had also indicated that they felt a sense of unity when they were learning together at the telecentre; hence, if the telecentre was utilised again for this purpose, the community members would feel that their need for relatedness is satisfied, and this could contribute towards strengthened motivation to partake in knowledge sharing and knowledge co-creation activities. Responses recorded by the participants showed that they still wanted to use the telecentre as a place of learning, as they felt a sense of unity and belonging when they used the telecentre. According to one of the respondents, the telecentre is an ideal place to conduct learning activities, as it would not only attract the younger generations, but elders of the community would also feel more comfortable there because of the informal setting and relaxed environment. By using an indigenised instructional design at the telecentres, there is also a higher possibility of capturing the interest and commitment to undertake training and learning programmes at the telecentre, especially when cultural considerations of indigenous communities throughout the planning, development and implementation phases of a project were taken into account.

In this respect, the purpose of the telecentre is indeed important in the community, as the telecentre would function as the central hub of these knowledge sharing and knowledge co-creation activities of the community members; hence cementing its role in supporting the learning needs of indigenous communities, especially in fostering knowledge sharing and knowledge co-creation.

5.6 Implications of the Findings

In highlighting some of the challenges faced with training programmes that make use of the general instructional design instead of an indigenised instructional design with indigenous communities, the study helped to identify some important considerations for

effective implementation of learning and training programmes that would support the basic psychological needs and foster motivation among the indigenous community members. Similar to existing research on culturally inclusive instructional design (Henderson, 1996; McLoughlin & Oliver, 2001; Thomas et al., 2002; Young, 2009), this study's findings indicate that it is important for the application of an indigenised instructional design when developing teaching and learning programmes with indigenous communities. When indigenous communities are afforded the opportunity to use cultural ways of learning and teaching during training or learning activities, their motivation and interest are strengthened, as these are methods that they are accustomed to and are familiar with. Examples of these were seen throughout the duration of the study, especially with the indigenous communities involved, as they navigated through the teaching and learning processes in ways that were both meaningful and met with their own needs. During the community-led learning programme, the responses that the community members gave, together with the responses that they received from their own family members highlighted the ways they were committed towards sharing their knowledge as well as the efforts they made towards knowledge co-creation with one another. Apart from that, they felt a greater pull towards sharing their knowledge with others when they could see the impact that their efforts had on the younger generations, allowing them to pass down their knowledge, which was an important priority of theirs.

Findings from the study also inform the field of Learning Sciences, especially in terms of using indigenous perspectives of learning and incorporating them into instructional design. Considering that existing research has called for more attention to be given towards including culture into the learning processes, and for professional development in assessment to guide educators in measuring all abilities of indigenous

students (Miller, 2018), this study can potentially shed insight on this area, and can inform the necessary considerations to design instruction that is more inclusive of indigenous and cultural needs. The findings here are important as they can serve as a guideline for those looking at working with indigenous communities, especially in terms of providing them with a more culturally inclusive learning experience. As can be seen in previous research with other indigenous communities, indigenous learners do not respond as well when they are placed in learning environments that are foreign to them, such as in formal learning spaces. The findings from this study can potentially inform how to best incorporate indigenous perspectives into the learning process, allowing instructors to leverage on these perspectives to provide learners with a more inclusive learning experience.

The study's focus on understanding how indigenous communities in Sarawak learn, their knowledge sharing and knowledge co-creation practices also add to indigenous research literature. Throughout the data collection phase, particularly when using methods of narrative inquiry, the researcher incorporated indigenous ways of data collection as well as cultural protocols when initiating data collection with the community. The research contributes towards indigenous research as it was undertaken using research and cultural protocols reflecting indigenous communities in Sarawak.

Aside from that, the findings in this study could potentially be used as a guideline for project teams intending to initiate learning programmes with indigenous communities. The usage of the ID-TABLET and the findings from the study regarding the needs of the communities and their reflections could shed insight on project teams that intend to work with indigenous communities during the project management stages, particularly those in Sarawak. The observations made during the implementation of learning and training

activities with the communities can also potentially inform project teams on the efficacy of implementing an indigenised instructional model when designing similar training programmes for the indigenous communities.

5.7 Limitations

As with any other research, there were several limitations identified that may have had an impact on the current study. Firstly, the group of participants selected for the study was a limitation, as the study only involved three out of twenty-seven indigenous ethnic groups in Sarawak. As a result, the findings cannot be considered to be representative of all the indigenous groups in Sarawak. Also, although there were more representations of indigenous communities during the pilot study, the number of representations ranged from one to two people per community, and therefore cannot be considered as a full exemplification of that community.

Aside from that, the geographical locations of the research sites were also another limitation to this study, as the researcher was only able to enter the research sites for a limited period of time and could only meet the participants several times a year. Due to this limitation, the researcher was also unable to meet with some of the potential respondents, as they were not at the research site when the researcher around. Member checking at the sites upon completion of all the data analysis was also unable to be carried out due to travel restrictions following the pandemic.

Another identified limitation to the study is language, as most of the participants would choose to speak in their native tongues, although most could also converse in Bahasa Malaysia. However, as was explained to the researcher, they could best express themselves in their native languages because there were times when they would struggle to

find a word that could carry the meaning that they wanted to convey. Hence, there were times that the researcher had to rely entirely on the community liaison to assist with translations during the interview, as well as when transcribing the interviews. These translations were then translated into English, and it is recognised that during this process of multiple translations, some of the subtleties of their explanations may have been lost.

Aside from that, another limitation for the current study was that there was only one physical trip made to Long Lamai, due to logistical challenges. Since the researcher was only able to enter the site once, member checking was not possible with all the respondents, and could only be done with respondents who could reply through mobile applications and phone calls.

5.8 Implications for Future Research

There is an interest in the development of culturally inclusive instructional design or indigenised instructional design. Following this present study, there is still room for more research in this area. Firstly, future research should consider the representation of indigenous communities, which was identified as one of the limitations of this study. As the current study is limited to only three indigenous communities located in remote, rural locations, future work could include more indigenous groups to gain more data regarding the efficacy of using an indigenised instructional design during the implementation of learning and teaching activities with indigenous communities.

It would also be worthwhile to consider rolling out similar programmes at different locations, such as at the *Pusat Internet* (Internet Centres) serving indigenous communities, as one of the objectives of the PI is to conduct trainings for the communities, it would be useful for the trainers to consider utilising an indigenised instructional design with the

community members as a way of addressing issues on community involvement from the users at the PI. Aside from that, the research could also be done to test using an indigenised instructional design in other settings aside from the telecentre or community information centres, in order to investigate if potential participants also show a strengthened motivation to share knowledge and co-create knowledge when taking part in learning activities that utilise indigenised instructional design.

Aside from that, the study also highlighted issues with technology at the research sites, as the sites could not fully support the MOOCs platform; hence the project team sought solutions to address this problem. Future work could include research on how to best use an adapted platform or adapt technologies to address the needs of these communities in order for these technologies to be adopted by them. This would then contribute towards the body of knowledge on adapting new technologies to particular locations or to specific cultural backgrounds, needs and challenges (Heeks & Kanashiro, 2009; Bala & Tan, 2021).

5.9 Conclusion

The current study began by exploring the potential of using an indigenised instructional design with indigenous community members at telecentres and seeking to determine if the motivation of the community members to participate in knowledge sharing and knowledge co-creation activities would be strengthened from utilising such an instructional design. Throughout the journey of data collection and assisting the project team with the implementation of the CL-MOOCs, the researcher gained more than the results of the investigation, with the findings of the study shedding insight on the value of using an indigenised instructional design.

By using the self-determination theory in this study, the extent to which indigenised instructional design supported the basic psychological needs of autonomy, competence, and relatedness of the indigenous community members, leading towards a strengthened motivation to participate in knowledge sharing and knowledge co-creation activities was established. Apart from that, analysis of the project implementation through the lens of Young's ID-TABLET also shed insight into where, when, and how the model's components can enhance the users' experiences. As all the research questions that the study sought to investigate were answered, it was found that there is value in utilising an indigenised instructional model with indigenous community members, especially in terms of strengthening their motivation to share knowledge and co-create knowledge.

The study's findings also reflect what has been recommended in the literature, especially when discussing that the local contextual needs of the community must be addressed. Recommendations on integrating culture into the instructional design to create an environment that resonated with indigenous communities were also reinforced in this study. Through the findings of this study, it is also hoped that insight on potential solutions to address issues about lower motivation levels of indigenous learners can be provided. This study also contributes towards the body of knowledge by providing a proposed list of requirements reflective of an indigenised instructional design that can potentially be used by project initiators, educators, government agencies, NGOs as well as those involved in the areas of instructional design development, project initiation with rural communities, telecentre research, and indigenous research.

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APPENDICES

Appendix 1: Interview Guide – Trainers

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Interview Guide (For the Trainers)

Trainer experience prior to training

Q: How many times did you go to the site?

Q: Were the community members consulted when the modules were developed?

Design of the modules and training at the telecentre

Q: How were the training modules developed?

Q: Was there a community elder who shared learning needs and preferences with the trainers/ module developers?

Training experiences at the telecentre

Q: How many times did you go to the site to conduct the training?

Q: How often were the trainings conducted? How long was each session?

Q: How was the training implemented? What was the teaching style used?

Q: How would you rate the trainings conducted at the sites?

Q: Did the community members make an effort to work on the modules outside of the training?

Feedback from the participants

Q: What was the reception of the community members like towards the training?

Q: Did the community members continue to work on the modules?

Q: What was the feedback from the community with regards to the training?

Changes to future modules

Q: What did you think should be changed about the trainings?

Q: How can an indigenised instructional design help with the implementation of the trainings at the telecentre/ future learning activities with communities?

Appendix 2: Interview Guide – Telecentre Managers

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iew Guide (For the Telecentre Managers)

Prior to the establishment of the telecentre

Q: Were the community members involved in the discussions prior to the establishment of the telecentre?

Q: How many times did the team enter the site?

Design of the modules and training at the telecentre

Q: Were you involved in the design and development of the training modules at the telecentre?

Q: Was there a community elder who shared learning needs and preferences with the trainers/ module developers?

Training experiences

Q: Were you trained to conduct trainings for the community members?

Q: How many times did you conduct the training?

Q: How was the training implemented? What was the teaching style used?

Q: How would you rate the trainings conducted at the sites?

Feedback from the participants

Q: What was the reception of the community members like towards the training?

Q: Did the community members continue to work on the modules?

Q: What was the feedback from the community with regards to the training?

Changes to future modules

Q: What did you think should be changed about the trainings?

Q: How can an indigenised instructional design help with the implementation of the trainings at the telecentre/ future learning activities with communities?

Appendix 3: Preliminary Interview Guide – Community members

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ninary Interview Guide (For the Community Members)

The areas that will be discussed with the participants:

General questions:

- Demographics
- Your role in the community
- Involvement in community projects (if any)
- Matters of interest to you and the community

Experience with telecentre

- Involvement with telecentre
- Opinions of the telecentre
- Importance of having telecentre at your village
- Learning experiences at telecentre
- How was the training conducted?
- Expectations of the community on the training
- Satisfaction with the training

How the community learns

- Learning in the community
- Knowledge sharing practices
- Knowledge co-creation practices
- What kind of knowledge do you want to share?
- Your role in community learning/ knowledge sharing (as an elder? As a younger member?)
- How do you share information with others?
    - Within your community
    - With others not from your community

Motivation to learn

- What motivates you and the community to share knowledge?
- What motivates you and the community to co-create knowledge?
- What matters are of priority to you and the community? (knowledge preservation?)

Appendix 4: Interview Guide 2– Community Members

UNIVERSITI MALAYSIA SARAWAK

iew Guide 2 (For the Community Members)

User/ learner experiences at the telecentre:

Q: Have you ever used the telecentre?

Q: When did you start using the telecentre?

Q: How often do you use the telecentre?

Q: What do you usually use it for?

Q: Have you ever followed any of the training sessions at the telecentre? (If no, why?)

Q: What training did you follow? Were there any other activities conducted at the telecentre? Like classes?

Q: Do you remember how the training was conducted? Can you tell me a bit about your experiences with the training?

Q: What do you remember from the training, what you learnt?

Q: What are the biggest differences, in your opinion, from the beginning, before it was established, till it was running and now?

Q: Do you think the telecentre is effective in terms of learning experience?

Q: Who taught you at the telecentre?

Q: Did they ask you to help to teach the rest of the villagers?

Q: What do you think is the most important part of the telecentre?

Q: What do you think should be learnt at the telecentre, in the community context.

Q: Before the telecentre was built, what were your expectations of the place?

Q: Are you satisfied with the telecentre and the training programmes?

Q: Do you think that the telecentre requires community effort when learning?

Q: What kind of learning activities should be held at the telecentre?

Q: How can the telecentre impact the community in terms of learning?

Learning within the community

Q: How does the community learn from one another?

Q: Do you think you should communicate and learn from those from people who are from other places?

Q: Did you and your friends ever discuss about what you did at the telecentre? Opinions?

Q: How does the community learn? Are you still interested in handicraft?

Q: Does this usually happen in the community? What do you usually share?

Motivation to use the telecentre

Q: How long did you spend in the telecentre last time? What did you do there?

Q: Was the response good? How so?

Q: If no, do you think this is because there was no training organised at the telecentre?

Q: What were your motivations to go to the telecentre?

Q: What kind of changes do you want to see in order to be able to evaluate if the telecentre was a success or not?

Q: When you used the telecentre, was language a barrier?

Q: So, if there are learning activities conducted there, maybe there would be more people using it?

Q: What kind of activities would you want conducted there?

Community priorities

Q: what is the most important in your community?

Q: In the village now, there are lesser and lesser people who have learnt all these traditions. Do you think that this is a loss for the community?

Q: When the mobile usage is higher, do you think they will become like the kids in the city?

Q: But if the place is changed to become a museum, can it help the younger generation learn about your culture?

Q: What kind of information do you want to know?

Q: Can PCs, mobile devices or the telecentres help to preserve this knowledge and to revive interest in this?

Q: What are the main concerns that the community has? What are your expectations and have they been met with or not?

Q: So if we want to make videos to document the knowledge of the people here, what should the videos be about? What is important to you?

Role of the telecentre

Q: Now the telecentre doesn't have the Internet and community now depends on mobile. Which is more suitable for the community?

Q: Do you think the need for the telecentre is still there? As now a lot of people are using mobile devices, is there a difference to it at all?

Q: What are the effects on the community now that there is no telecentre?

Q: In your opinion, what do you think must be available at the telecentre to help people learn?

Q: Do you think that development that is brought about by the telecentre and modernisation will change the community?

Q: I want to ask, as an elder of the community, what do you think about the passing on of your community's cultural knowledge to the younger generation. Do you think it can be done in a place like the telecentre? Do you think the internet or ICT is important in order to pass on your own knowledge?

Appendix 5: Discussion Guide – Focus Groups

UNIVERSITI MALAYSIA SARAWAK

ssion Guide (Focus Groups)

User/ learner experiences at the telecentre:

Q: Have you ever used the telecentre?

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Q: How often do you use the telecentre?

Q: What do you usually use it for?

Q: Have you ever followed any of the training sessions at the telecentre? (If no, why?)

Q: What training did you follow? Were there any other activities conducted at the telecentre? Like classes?

Q: Do you remember how the training was conducted? Can you tell me a bit about your experiences with the training?

Q: What do you remember from the training, what you learnt?

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Q: Do you think the telecentre is effective in terms of learning experience?

Q: Who taught you at the telecentre?

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Q: What do you think is the most important part of the telecentre?

Q: What do you think should be learnt at the telecentre, in the community context.

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Q: Are you satisfied with the telecentre and the training programmes?

Q: Do you think that the telecentre requires community effort when learning?

Q: What kind of learning activities should be held at the telecentre?

Q: How can the telecentre impact the community in terms of learning?

Learning within the community

Q: How does the community learn from one another?

Q: Do you think you should communicate and learn from those from people who are from other places?

Q: Did you and your friends ever discuss about what you did at the telecentre? Opinions?

Q: How does the community learn? Are you still interested in handicraft?

Q: Does this usually happen in the community? What do you usually share?

Motivation to use the telecentre

Q: How long did you spend in the telecentre last time? What did you do there?

Q: Was the response good? How so?

Q: If no, do you think this is because there was no training organised at the telecentre?

Q: What were your motivations to go to the telecentre?

Q: What kind of changes do you want to see in order to be able to evaluate if the telecentre was a success or not?

Q: When you used the telecentre, was language a barrier?

Q: So, if there are learning activities conducted there, maybe there would be more people using it?

Q: What kind of activities would you want conducted there?

Community priorities

Q: what is the most important in your community?

Q: In the village now, there are lesser and lesser people who have learnt all these traditions. Do you think that this is a loss for the community?

Q: When the mobile usage is higher, do you think they will become like the kids in the city?

Q: But if the place is changed to become a museum, can it help the younger generation learn about your culture?

Q: What kind of information do you want to know?

Q: Can PCs, mobile devices or the telecentres help to preserve this knowledge and to revive interest in this?

Q: What are the main concerns that the community has? What are your expectations and have they been met with or not?

Q: So if we want to make videos to document the knowledge of the people here, what should the videos be about? What is important to you?

Role of the telecentre

Q: Now the telecentre doesn't have the Internet and community now depends on mobile. Which is more suitable for the community?

Q: Do you think the need for the telecentre is still there? As now a lot of people are using mobile devices, is there a difference to it at all?

Q: What are the effects on the community now that there is no telecentre?

Q: In your opinion, what do you think must be available at the telecentre to help people learn?

Q: Do you think that development that is brought about by the telecentre and modernisation will change the community?

Q: I want to ask, as an elder of the community, what do you think about the passing on of your community's cultural knowledge to the younger generation. Do you think it can be done in a place like the telecentre? Do you think the internet or ICT is important in order to pass on your own knowledge?

Appendix 6: Interview Guide CL-MOOCs

UNIVERSITI MALAYSIA SARAWAK

iew guide (CL-MOOCs) – Pre and post rollout

Expectations of the community with regards to ICTs

- What do you think you can achieve with ICTs?
- How important are ICTs for the community?
- How familiar are you with ICTs?
- What are the challenges you face with ICTs?

The role of ICTs in preserving indigenous knowledge

- What do you want to learn about? Or share knowledge about? Can ICTs be used to do this?
- What do you think about preserving indigenous knowledge?
- Do you think that ICTs can be used to preserve indigenous knowledge?
- How do you think this can be achieved?

The role of the community in using ICTs to preserve indigenous knowledge

- What do you think your role is in doing this?
- Do you think you can contribute towards knowledge preservation through the use of ICTs?
- How do you feel about being a trainer for the CL-MOOCs?

Other questions for post rollout:

- Have any of your opinions changed after undergoing the CL-MOOCs programme?
- How do you feel about the CL-MOOCs programme?
- What do you think about ICTs now?
- What do you think ICTs can do for the community?
- How do you think ICTs can be utilised for knowledge preservation?
- What other modules or changes would you like to see with the CL-MOOCs?

Appendix 7: Consent form

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Borang Kebenaran Untuk Mengambil Bahagian dalam Kaji Selidik

Sila baca maklumat berikut dengan teliti.

Saya, _____ akan menjalankan penyelidikan ini bagitujuan pengumpulan maklumat untuk kajian PhD penyelidik. Saya fahamkan bahawa penyertaan saya adalah secara sukarela, dan saya boleh menarik diri dari sesi ini pada bila-bila masa.

Tujuan

Sebagai peserta dalam sesi, kajian ini bertujuan untuk mengumpul data mengenai pengalaman anda dengan aktiviti pembelajaran di telecentre, cara pembelajaran tradisional dalam komuniti, amalan dan kriteria pembelajaran dalam komuniti etnik, keperluan pembelajaran, isu-isu yang menjadi tumpuan atau dianggap sebagai kepentingan dalam komuniti serta pendapat anda mengenai cara pembelajaran di telecentre. Hasil pengumpulan data ini akan digunakan untuk analisa bag tujuan penyelidikan pengajian PhD penyelidik.

Privasi anda, pemerhatian dan rakaman data

Sila maklum dan yakin bahawa maklumat dan pendapat yang anda berikan akan hanya digunakan untuk tujuan penyelidikan.

Segala maklumat peribadi anda dan rakaman adalah sulit. Bagi mana-mana dan semua kegunaan data ini direkodkan untuk menjamin ketanpanamaan anda. Nama anda tidak akan digunakan dimana-mana melainkan borang persetujuan ini, yang akan disimpan untuk pengesahan persetujuan anda dalam menyertai sesi soal selidik ini. Borang ini akan dilupuskan dalam tempoh 1 tahun sepanjang penyiapan kajian PhD ini.

Jika anda mempunyai sebarang pertanyaan yang selanjutnya, anda boleh menghubungi saya, Jaya Laxshmi di 016-5755985 atau laxshmi82@gmail.com

Akuan Perjanjian

- Saya telah membaca maklumat yang diberikan dalam halaman sebelumnya.
- Saya dengan rela hati menawarkan diri untuk mengambil bahagian dalam kajian ini.
- Saya telah dimaklumkan terlebih dahulu akan tugas-tugas dan prosedur yang akan diikuti.
- Saya telah diberi peluang untuk bertanya soalan dan segala soalan saya dijawab dengan memuaskan.
- Saya sedar bahawa saya mempunyai hak untuk menarik balik kebenaran and memberhentikan penyertaan pada bila-bila masa, tanpa menjejaskan tanggapan dan layanan saya pada masa hadapan.
- Tandatangan saya di bawah ini boleh diambil sebagai ikrar semua penyata di atas; ia telah diberikan sebelum penyertaan saya dalam soal selidik ini.

Saya,_____

(Nama Peserta)

telah membaca petikan di atas dengan teliti dan memahami kandungannya. Saya secara sukarela bersetuju untuk mengambil bahagian dalam penilaian yang dijalankan oleh pihak ahli kaji selidik.

_____ _____

(Tandatangan Peserta) (Tarikh)

_____ _____

(Tandatangan Penyelidik) (Tarikh)

Appendix 7: Observation guide

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Observation guide

Interaction among community members

- Frequency of communication
- What are the hierarchies during these interactions (if any)?
- What are the dynamics of their interaction?
- Content discussed during workshop

Community ways of learning

- Ways they shared their knowledge with one another
- Were there any other indication of what they wanted to do during the sessions and the styles of learning they wanted to use?
- Were the ways they learnt with one another similar to what was mentioned during the interviews?
- The dynamics of how they shared knowledge and co-created knowledge

Motivation among community members

- Interactions, conversations that show an increased or decreased interest or motivation among the respondents
- Actions of the respondents during sessions – do they indicate stronger motivation to share and co-create knowledge?

Other points to consider:

- What stories did they share?
- Were their interactions in a natural and comfortable environment?
- Were there any clashes of opinions or ideas? If yes, why did they arise and how did they resolve it?

Appendix 8: Sample of modules and lesson plan for ICT literacy training

No	Module	Learning outcome	Contents	Strategy / Evaluation
1	Internet Browsing using Mozilla Firefox	After completion of the module, communities should be able to: Know how to start and close the web browser, Firefox Follow the step-by-step procedures on how to view the websites	Starting and closing web browser, Firefox Viewing webs (i.e. youtube, *berita harian*, *resipi.net*, *portal pendidikan*, etc)	Strategy: • Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore Evaluation: • Pre & Post tests
2	Email (*www.gmail.com*)	After completion of the module, communities should be able to : • Create email account using Gmail. • Compose and send emails to friends and relatives. • Communicate online with friends and relatives using 'Chat' in Gmail.	Sign up for a new email account Login to email Email start up: Main page Read an email Reply an email Delete an email Delete emails from Trash Bin Send an email Chatting using 'Chat' in Gmail Receiving and sending file using attachment	Strategy: • Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore Evaluation: • Pre & Post tests

	OpenOffice.org: Writer	After completion of the module, the community should be able to: • Know how to open, create, save and close documents and understand how documents are presented on the screen. **(*Cognitive – C1-Knowledge)*** • Select and work with text in a document. **(*Cognitive – C1-Knowledge)*** • Format text in a document and work with all the application. **(*Pshychomotor-P3-Guided Response*)** • Understand and use various Writer settings. **(*Cognitive – C1-Knowledge)*** • Access and use the help system and work safely with the computer**.** • Work on their own document, incorporating all the techniques of content manipulation that is taught during the training. **(*Affective-A3-Valuing)***	The Basic of the OpenOffice.org Writer Creating, Saving, Opening and Closing files Using the Insertion Point and Entering Text	<u>Strategy:</u> • Trainer session • Facilitators teach, trainers observe • Trainers teach • Self explore <u>Evaluation:</u> • Pre & Post tests