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Rural Empowerment through Education: Case Study of a Learning Community Telecentre in Indonesia

Wichitra Yasya
University of Muhammadiyah Jakarta, South Tangerang, 15419, Indonesia
Email: w.yasya@gmail.com

Abstract: This research aims to investigate the impact of information and communication technologies (ICTs) for development and social change in a rural telecentre in Indonesia. It attempts to contribute to the literature of ICTs for development and social change, in the field of analysis of a community-driven ICTs initiative and the analysis of an Indonesian telecentre, two research areas that had not been extensively explored. A qualitative case study approach was chosen to reveal the how ICTs are used in community empowerment in the case of Qaryah Thayyibah Learning Community, a school with a telecentre that in founded, run and funded by the community of Kalibening Village in Central Java, Indonesia. Through the application of the stakeholder theory, significant findings related to impact of ICTs for social change of the Qaryah Thayyibah Learning Community were revealed. These findings include patterns of access and participation of stakeholders in relation to ICTs. While ICTs had impacted the students of Qaryah Thayyibah, its impact had not yet been significantly experienced for the wider community outside of the school. Another important finding that emerged from the stakeholder analysis is the influence and value of the local champion in the establishment and sustainability of the ICTs initiative. In conclusion, the findings suggest that education such as that practiced in the Qaryah Thayyibah Learning Community can contribute in achieving rural empowerment, although the process may be long and complex. As this is an exploratory study investigating unquantifiable intangible impacts, further research can focus more on these intangible impacts through different lenses such as culture, power dynamics and social relations.

Index Terms: Telecentre, ICT4D, communication for development, rural empowerment, learning community

1. Introduction

The use of information and communication technologies (ICTs) in development and social change efforts (ICT4D) is becoming widespread in the hope that providing ICTs can bring about social and economic benefits to promote development. One of the ways of providing access to ICTs is by setting up a shared facility i.e. the telecentre in remote, rural or other disadvantaged communities.

Information on the use of ICTs for development is widely available, but analyses of their impacts are not as common. A sound evaluation on how ICTs play out in development efforts particularly in rural areas – on how rural communities can maximise the benefits of ICTs – is still a challenge [1]. Impact analyses of telecentres – as a form of utilising ICTs for development – have been done by various researchers from different bodies and agencies (see for example, [2–4]). However the literature mainly reports impacts of telecentres that are set up by external bodies such as foreign donor, government, or NGOs – even if the principle of the telecentre is to be as local as possible. These donor-funded telecentres do not seem to perform as well as a community-owned one [5]. Meanwhile, the reporting of a telecentre that is community-initiated has not been widely reported, perhaps because of the lack of networking of these communities to disseminate their stories and experiences to the ICT4D community and the wider population.

In terms of location, an analysis of telecentres in particular countries such as Indonesia is also not extensively available. Although Indonesia as a developing nation has a wide rural area and population that serves as an excellent laboratory for these development efforts, research done on these efforts are not extensively reported, even though there are a plethora of these kinds of efforts dispersed throughout the country.

Based on the examination presented above, the research issue that emerged was that there is little evidence of the impacts of ICTs for development particularly through the establishment of community-initiated telecentres in rural Indonesia. This leads to a statement of the research problem: *How deep is the impact of the use of ICTs in the Qaryah Thayyibah Learning Community in rural Indonesia on the lives of its students and the community?*

The statement of the research problem is attempted to be answered through using the framework based on ICTs for Development theory and stakeholder theory, while implementing the case study approach with qualitative methodology in obtaining and analysing the data.

2. Theoretical Framework

This paper investigated how this community-initiated effort to harness ICTs for development through the establishment of a telecentre in their rural village has impacted on their community in relation to achieving development goals. In doing so, it will be based on ICTs for Development theory and stakeholder theory as the framework that served as the guide in directing the research.

A. ICTs for Development and Social Change

In the present era, introducing technology to underdeveloped societies, especially in rural areas, is still the common path to achieving development. This technology is now represented by ICTs. Since the 1970s, there has been significant proliferation of harnessing ICTs for social change in developing countries, leading to a body of knowledge sometimes termed as ICT4D (ICTs for development) [1]. Two decades later, with the arrival of the Internet, ICTs were more than ever seen as the panacea to achieve development.

ICTs were seen to have many socioeconomic benefits which would enhance development particularly in rural areas. These benefits include providing information and networks for markets, supporting education and agricultural research and extension as well as telemedicine and health, creating employment and business opportunities, and providing a platform for facilitating social interactions [1, 6, 7]. The many benefits that ICTs offer attracted international development agencies, governments and nongovernmental organisations to fund and implement projects focused on using ICTs for promoting development and creating social change.

A popular form of ICTs for development projects is the setting up of a telecentre in areas where ICTs were a rarity. A telecentre is a place which provides public access to ICTs-based services and applications [8, 9]. The services and applications provided were usually in the form of telecommunication services (telephony, fax, Internet), office equipment (computers, printers, scanners, photocopiers), multimedia hardware and software (radio, television, video, digital cameras), and also meeting spaces for training and general community use [8, 10]. It is comparable to public telephone or Internet kiosks that were managed privately with commercial interests, although the telecentre often put forward the goal of development and social change of communities rather than monetary profits.

The telecentre movement was said to originate from Sweden in 1985 with the establishment of telecottages in areas experiencing barriers in participating in the information economy due to distance, cost, and low-quality ICT facilities [8]. A decade later, it was adopted to serve rural communities in developing countries, mainly sponsored by international development agencies partnering with national governments, local NGOs and private sectors.

Another decade later, in entering the 21st century, the telecentre and other ICTs for development projects did not report a holistic result of improved living conditions in the communities where these efforts took place. The questioning of the role of telecentres and other ICTs for development projects were related to issues of sustainability, scattered and unconvincing impact assessments and evaluations, and the overemphasis of technology over political, economic, socio-cultural and institutional factors [11, 12]. These issues will be briefly discussed in the following paragraphs.

Sustainability relates to how the initiative is able to maintain and support itself continuously over time. Sustainability may be considered in two forms: social sustainability which refers to the long-term contribution of the telecentre to socioeconomic development of the community, and financial sustainability where the telecentre returns economic profits for those who have invested in it [13]. Like many other development projects, the problem of sustainability arises when the external donor stops its funding and leaves the community to continue without providing the community the knowledge and tools on sustaining the initiative. Especially in ICTs projects, the equipment and facilities need a lot of money to start up and maintain, and the constantly-evolving technology meant that the ICTs provided may become obsolete and communities who embraced ICTs must continuously be updated to this new technology. To overcome the problem of sustainability in ICTs for development projects, [9] and [14] suggest that the answer lies in revitalising the critical role of local organisations (or individuals) forming a voluntary effective partnership at the local level. Furthermore, a continual process of addressing stakeholders may also aid in increasing sustainability of an ICTs for development initiative [12]. This means that the people aspect is more important than the technology aspect.

Putting the people first rather than the technology when viewing ICTs for development projects meant that the person or the community itself shape ICTs for their benefit, rather than the community being driven to advance to a better living standard by ICTs. ICTs itself is socially constructed and its impacts can only assessed through the creativity of the people who use it [11]. the people aspect is more important than the technology aspect. When introducing ICTs to a community, we must take into account that the effort will have more chance of being successful when the people have defined their own information and communication needs and preferences and are using and adapting the technologies according to how they want it. This concept of local appropriation of ICTs require participation of all stakeholders, and will contribute to facilitating community decision-making, providing a voice to the

voiceless, advancing community ownership and as a result empowering communities to take charge of their own development [15].

B. ICTs for Development in Indonesia

Indonesia is an archipelagic country with over 17,000 islands spread out in an area of around 1,900,000 km^2 that is home to more than 250 million people. This condition has made harnessing ICTs in the whole of the country become a giant challenge, whereby the development of ICTs was only present in densely populated areas with higher economic values such as the islands of Java, Bali and parts of Sumatra. Like many developing countries, the problem of cost and distance hinder ICTs development in the nations.

The telecentre is an attractive model in harnessing ICTs for development in Indonesia. This was because the concept of public access to communication technologies was not new to the country. Since early 1990s, telephone shops were set up by private enterprises – often small or medium businesses – to cater those who could not access the telephone in their homes. The user would pay for the phone connection at a fee. The same concept was applied with the Internet.

Even though there have been many efforts to set up a telecentre particularly in rural areas, the rural communities are still largely underserved. In reality only few telecentres are reported to have a sustainable model. The challenge of sustainability is faced as governments prefer quick disbursements over focus on long-term benefits and applying projects which do not take into account the people's needs and readiness [16]. Instead of learning from best practice telecentre models in the country and sustaining these telecentres, the government was more interested in establishing new models of telecentres as projects. In terms of regulations and policy, the government tend to focus on security regulation rather than creating opportunities and facilitating increased penetrations and access, and its national plan on ICTs for development lack concrete measures to be made [16]. The issues presented have created barriers in deploying ICTs for development in rural areas in Indonesia.

A promising way of delivering ICTs for development in rural areas is through the communities itself or through the mediation of local community organisations. The use of the Internet facilitated by the community learning centre as was in the case of the research site, Qaryah Thayyibah Learning Community, were also reported as having sustainability and able to survive [17].

C. Stakeholder Theory

The impact of ICTs in this research was studied by the application of stakeholder theory. Stakeholder theory developed from the field of corporate organisational management and business ethics [18, 19]. Dealing with stakeholders mean that it concerns identifying stakeholder and analysing relationships between them and the organisation in order to reach a common goal – both of the organisation and its stakeholders [20-21]. A widely recognised and oft-cited definition of stakeholder is the one provided by Freeman: "A stakeholder in an organization is (by definition) any group or individual who can affect or is affected by the achievement of the organisation's objectives" [22, p. 46]. The way stakeholder is defined and identified influence how stakeholder theory is elucidated [18].

In the effort of gaining clarity, the stakeholder theory is classified into three main aspects. This taxonomy was first put forward by [23], arguing that there are three aspects of stakeholder theory: descriptive, normative and instrumental. *Descriptive* stakeholder theory is empirical, an approach that sets to describe the characteristics and behaviour of the stakeholders and the organisation [12], [18]. Another aspect of stakeholder theory is that it is *instrumental*. The instrumental version of stakeholder theory implies hypothetical claims that *if* the interests of stakeholders are taken into account, then the organisation will do better [23]. *Normative* stakeholder theory derives from corporate social responsibility and business ethics literature, based on the Kantian theory of common good, where it was perceived that stakeholders must be accounted for if the organisation was to succeed [24].

In practice, applying the stakeholder theory often means conducting a stakeholder analysis. A stakeholder analysis is the identification of key stakeholders in the project and their roles, interest, influence and how they might affect the project [20]. There are many ways to conduct a stakeholder analysis, depending on factors such as the aim and time dimension of the analysis, the context of the analysis and the level of the analysis. Therefore, a stakeholder analysis may vary according to what it is conducted for.

Although implementation of the stakeholder analysis may vary, the steps involved are generally similar. These steps are: 1) Stakeholder identification; 2) Assessments of their behaviour and influence; 3) Identify the risks/assumptions that would affect the organisation or project success or how they are affecting and have affected the organisation/project's goals; 4) Determine concessions/bargains needed if the previous management strategies fail to work. [12, 20, 22, 25].

As been explained previously, understanding stakeholders can be very useful in analysing a project's success. While stakeholder analysis is usually done in the appraisal process of a project, applying the stakeholder theory in an impact analysis can also be particularly potential as it is at this stage that most stakeholders and the rationale of their behaviour has emerged quite clearly [12, 20, 25]. A stakeholder analysis is then done, and the impact assessment of ICTs in development is produced based on this stakeholder analysis. The use of the stakeholder theory as the framework

of this research will be based on the assumption that analysing stakeholders of this initiative will provide an understanding of how the telecentre affects the stakeholders and to generalise that to come to the conclusion on how the telecentre as a medium of ICTs access affect the village community.

D. Related Works

Through an iterative analysis of stakeholders, one can understand further the impacts of ICTs for development projects. Stakeholder theory was used to analyse a telecentre in Zambia, concluding that stakeholder involvement resulted in higher community acceptance, awareness and adoption of ICT services of a telecentre under a Public Private Partnership scheme [26]. An analysis of a telecentre that is entirely run by the local community did not much exist, even though the literature provides a wide number of impact assessment studies and impact assessment guidelines in the past [2–4, 27]. Heeks and Molla have compiled these in a very comprehensive compendium summarising a series of frameworks used in impact assessments for ICTs for development projects and a bibliography of impact assessments done in the past, identifying that there exists too little impact assessments of ICT4D projects [3]. The literature that exists on this subject was mainly scattered, superficial, and uncomprehensive [27]. Impact assessments or studies were done based on Western perspectives, to treat particular organisations or sectors, and did not address long-term consequences on the society as a whole but focused too much on simplified successes of small user communities. Furthermore, it relies too much on quantitative results, whereas studying impacts on people mean listening to their stories, as done by Dey *et al* [28] through an ethnographic study of a telecentre.

It can be concluded that impact analyses of ICTs for development projects are rare, and particularly in the context of Indonesia. Furthermore, these assessments of ICTs for development projects are mainly done by and for organisations, on projects funded by those organisations. Assessments of initiatives from the grassroots levels are hardly documented, due to the reason that grassroots organisations do not see their work as 'newsworthy' and even if so, they lack the networking to share their experiences with other practitioners or the wider population as a whole [15].

Based on these premises, the research aimed to examine the impacts of information and communication technologies (ICTs) on the community of a school-based telecentre in a rural village in Indonesia. The community refers to the Qaryah Thayyibah, a learning community devoted to education and empowerment of their rural village that is located in Central Java, Indonesia. The question that the research attempted to answer was: *How has the use of community-initiated ICTs in Qaryah Thayyibah affected the lives of its students and the people of Kalibening Village, especially in its goal of achieving empowerment?*

3. Methodology

The use of qualitative methodology in the research was seen as the most suitable as quantitative impact measurement of ICTs has been discussed as problematic and not quantifying holistic impacts [27]. The research was conducted on the basis of instrumental, single-case study approach. Single cases are common in case study research design, and becomes justifiable when the case represents a critical test of existing theory, a rare or unique circumstance, or a representative or typical case, or where the case serves a revelatory or longitudinal purpose [29]. The single-case design was selected, based on Yin's rationale that the Qaryah Thayyibah Learning Community telecentre as the phenomenon to be studied represents a unique case. The selected case is unique, in the sense that the case has reported "unusual successes" [30].

A. Data Collection

The methods used in collecting data for the research were interviews and direct observation. The data collected in this research were in the form of interview recordings and notes, and field notes from observations.

The observation process began with the researcher spending one whole day immersing herself in the setting in the first day of arrival. Observations in the following days were done systematically for 6 hours each day for a total of 6 days in and around the school telecentre. The observation results were recorded in writing in the form of field notes taken while observing the events and shortly thereafter.

Interviews are done as it is one of the major sources of information for a case study [29]. The type of interview conducted in the research was semi-structured interview. The interview sample was selected based on the researcher's assumption on who is regarded as a stakeholder in the school-based telecentre at Qaryah Thayyibah. These were: the founder of the school, the students, the teachers, community leaders and/or higher government officials and ICT provider. After going into the field, however, these were slightly modified and the stakeholders interviewed were founder of the school, students, teachers, parents, and a representative from the peasant organisation that is associated with the school. These interviews were conducted around the Qaryah Thayyibah site. The questions that were asked were focused on studying the impact of ICTs. The questions revolve around stakeholder perceptions on ICTs which include issues such as familiarity, access, participation, and impact.

B. Data Analysis

Analysis of the data in this research followed Miles and Huberman's analysis process: 1) Affixing codes to field notes from observations and document data or interview transcripts; 2) Marking reflections on the data; 3) Sorting and sifting through these materials to find common phrases/themes/patterns, or distinct differences; 4) Identifying the commonalities and differences; 5) Making generalisations; 6) Verifying and justifying the generalisations. It used the constant comparative method to build grounded theory, where generalisations are grounded in or inferred from the data collected [31]. The constant comparative method meant that comparisons are used to make sense of the data, in categorising the data to explain the meaning of the data [32]. By constantly comparing and contrasting the information collected, the patterns that emerged were then used to develop a theory.

The coding process was done with the aid of NVivo 8 and involved two phases, the first being to organise descriptive information from the data, and from this information further coding is done through and for finding patterns and themes. The first phase of coding is *open coding* or *descriptive coding*, identifying words, phrases, and sentences that reflect the research questions. The second phase of coding is *analytic coding* or *pattern coding*, where the open codes were analysed and refined by grouping them into certain topics. Based on the topics, another round of analysis was done involving looking for themes and patterns that emerged. These themes were then discussed based on the stakeholder theory and analysis framework provided earlier in this chapter. From the discussion of the themes that was based on the provided theoretical framework, generalisations were made to come to the conclusion that would answer the initial research questions.

C. Reliability and Validity

In qualitative research, reliability and validity can be produced by conducting the research in a systematic and ethical manner. This means the researcher follows procedures and is aware of the nature of qualitative inquiry that always values truth—however the truth might be constructed. This can be done through triangulation,   which is the process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation [31]. There are four types of triangulation: 1) using different data-collection methods through *methods triangulation*, 2) *sources triangulation* by checking the consistency of different data sources from the same method, 3) using multiple researchers to review findings in *analyst triangulation*, and 4) *theory/perspective triangulation*, done by using multiple perspectives or theory to interpret data [30]. Only two types of triangulation were able to be practiced in this research: methods triangulation and sources triangulation. Methods triangulation was done through the use of semi-structured interviews and observations as two different data-collection methods, and sources triangulation was used by selecting different stakeholders as data sources to be collected through the two different methods described before.

4. Results

A. General Description of the Research Site

The Qaryah Thayyibah Learning Community is situated in Kalibening Village in the subdistrict of Tingkir in the Central Javanese city of Salatiga, Indonesia. Kalibening is about 3 kilometres away from the city centre. The village is predominantly rural, with most of its people involved in farming either as farmer or farm labourers.

In the simplest term, Qaryah Thayyibah is a school. It provides education for children at the secondary level (Year 7 through to Year 12), and is expanding to establish a "university". However, Qaryah Thayyibah is not an ordinary high school, it is recognised by the Ministry of National Education as a non-formal education provider as its principles and operations are different to a 'formal' high school. The people involved in Qaryah Thayyibah did not like to refer themselves as a school but rather as a learning community. It is heavily focused on the community as the basis of learning.

The principle of community-based schooling adopted in Qaryah Thayyibah meant that learning must come from the community and the results given back to the community. In practice, this means that the learners are given freedom to learn what they want, how they want it. Education is managed together by the community involving villagers, village authorities, parents, teachers, and students. Learning is mediated by the use of ICTs and their natural environment as their laboratory [33]. Learning outcomes were not evaluated using paper examinations but in the form of creative works such as writing, film, music, or artwork.

The school was established in 2003 by D, a community member who was then head of a federation of peasant organisations (*Serikat Paguyuban Petani Qaryah Thayyibah,* or SPPQT). At a village meeting he brought up the issue of education – especially the issue of village children having to go to the city to get further quality education after graduating from primary school.

> *The main goal of the meeting was not to establish a school, but to figure out how to anticipate the*
> *children who originally studied in their villages and must go to the city to keep studying at a*
> *higher level. The meeting led on to discuss the problems of education, including the problem of*

school fees; we had to pay Rp 750,000 to get into the school, and quality of education. So I proposed to set up our own school, if there were 10 students willing to be in it then we will establish this independent school. From about 30 people who attended, most of them rejected the idea (about 18 families), but then there were 12 families who agreed.

The school officially opened on 21 July 2003 with those 12 students in the garage of D's house. The teachers were originally volunteers who came from peasant organisations. For learning materials, they relied on the Internet, which was already present in D's house that was also the secretariat of SPPQT. They also relied on any resource they could get around their community, for example a neighbour who was a doctor helped the students design the menu for the students' daily meals at school, and the milk and honey that was the students' daily breakfast came from the local dairy.

Students are mostly from around the Kalibening area, while a small number of them came from outside the village who were interested in the education experience at Qaryah Thayyibah. Most of the students are from lower to middle-class families, whose parents worked as farmers, farm labourers, or involved in small businesses.

B. Observation Results

Observations were made around the area where most of the learning activities were being held. Although Qaryah Thayyibah itself has no official buildings, learning activities were mostly centred on a building called the Resource Centre. The building is located adjacent to D's house. It is surrounded by villagers' houses, a small mosque, and a hut that was the school canteen, but it was closed due to Ramadan. This three-storey building is located in front of D's house. The first floor of the building is a multipurpose hall. It housed computers and facilities for a telecentre, and also served as a library with hundreds of books. The second floor was being used as the school's music studio, but will later be used as accommodation for guests of the school. The third floor was currently under construction, but it was planned to be a soundproof music studio for the students or other community members to practice music.

There are no set schedules for learning at Qaryah Thayyibah, so the students come and go as they please. Each class had their own schedules that they have made up. Normally every class meet around the area in the morning, be it in front of the mosque, in the courtyard of the Resource Centre, or inside the Resource Centre itself. Every class had the responsibility of forming the learning schedule and discussing it with the facilitators (teachers).

The multipurpose hall is one of the most occupied places for Qaryah Thayyibah students. They would be in the hall to access computers and Internet, as well as doing other things from drama club rehearsals to wushu practice. The hall is also home to the telecentre. There were 6 computers and 1 printer lined on one side of the wall, one of which served as the operator computer and printer. Book racks with hundreds of books were lined on the other side of the wall. The hall also had an LCD projector and speakers that were held using pieces of wood on the ceiling.

The telecentre facilities were managed and run by a committee of Qaryah Thayyibah students. The committee was responsible for the management and operations of the telecentre. The telecentre was mostly occupied by students – either from Qaryah Thayyibah or from other schools who were close to the area, or students who did not go to Qaryah Thayyibah but lived in the area. Most of these students access the computer in groups, where one computer may be used by a group of students instead of one computer per student. There seemed no difference in terms of access for boys and girls, but boys seemed to occupy the computers more than the girls.

The busiest hours for the telecentre were in the morning up to midday. This would be because at this time most of Qaryah Thayyibah students are present in the area, and by midday they would retreat or stop and pray at the mosque for their afternoon prayer. There was a piece of paper pinned at the door notifying the opening hours of the telecentre which were from 9am – 10pm daily, and closed between 12.30pm – 1.30pm, but during the observation many people were still accessing the computers freely at this time. At night time the telecentre was also packed; the users would come at this time to download heavy-sized documents such as songs and videos, because at this time the download speed would increase and the telecentre also offered access at a discounted price. When the computers were in use, most of them were used for studying purposes, entertainment purposes (for games, songs and videos), and for socialising through email, instant messenger and social networking sites.

The results from the observations served to give an impression of the surroundings and also provide additional information – to strengthen or contradict – the interview results explained in the following section.

C. Interview Results

Interviews were conducted to the stakeholders involved in Qaryah Thayyibah. These stakeholders were identified as Founder, Parent, Student, Teacher, Peasant Organisation Representative and Education Official. The stakeholders were asked questions that were focused on familiarity, access, participation and impact of ICTs.

In most cases, the first question that would be asked in the interview was *"How did you become familiar with the computer and the Internet?"* Most of the respondents answered that they became familiar with the computer outside of their home, either at school or at a public Internet kiosk. Almost all the students interviewed said that they had learned how to use the Internet at Qaryah Thayyibah. They were also asked what other technological tools that they were

familiar with, and most of them were familiar with cellular phones, with one respondent saying that the school facilitated him to be able to use a professional video camera to make films.

In the interview, access refers to *how* ICTs were accessed for the respondents. While most of the respondents owned a computer at home, none of them had Internet access at their home with the exception of the Founder and Peasant Organisation Representative. They relied on the telecentre to access the Internet.

The Student respondents accessed the computer for study purposes as well as entertainment and social purposes. Study purposes include literature searching, writing, film editing, graphic design, mapmaking, and whatever it was the student is interested to learn. Entertainment purposes include general browsing, downloading songs or video clips/movies, or playing games. While for social purposes, they identified to using social networking sites and instant messenger to connect with their friends.

The Peasant Organisation Representative identified how he and his colleagues access the Internet. The Internet was a component of their organisation that they used to connect with other members and also other stakeholders of the organisation such as businesses. They used email to exchange information, and information exchange was also facilitated by the organisation's website:

> *For the farmers, they could get the price of a commodity from the Internet. They could come to our*
> *office and find out the price of a commodity so they don't have to ask around everywhere.*

He further explained that the farmers who had access to computer and Internet were the ones who had a position in the Peasant Organisation.

The student's Parents and Teachers both said that their access to ICTs was heavily influenced by the children. The children's adoption of ICTs also motivated them to use ICTs. One parent said that he used the computer at home to write, motivated by his daughter who had published a number of novels. He said:

> *Yes, it really had affected me personally. In the sense that the knowledge that my child learned at*
> *school I can learn as well, including the computer. Because my child is familiar with the computer,*
> *so there is a computer at home and I also learn how to use it. Including my child's habit of writing,*
> *made me want to practice writing as well.*

Another parent had just learned how to type on the computer following his child who learned touch-typing at school.

Participation refers to the role of the stakeholders in mediating ICTs in the community. The Founder and Peasant Organisation Representative explained the concept of Resource Centre, a hub where all the resources in the village is pooled. In this concept, ICTs become another resource along with farming tools, vehicles, books, and so forth. They explained that ideally, the whole community should participate in the management and mediation of all these resources. But in reality, this concept had not been fully realised as it is still in the process of raising awareness of the community of the significance of the Resource Centre.

When asked about how ICTs – in this case the telecentre – is managed, the respondents explained that it was managed by a committee that comprised of Qaryah Thayyibah students who were willing to participate in the management and operation of the telecentre. The committee's role would be responsible for paying electricity and Internet bills, purchasing and maintenance of equipment, financing and managing daily operations of the telecentre itself. The committee members could change from time to time, and that would also mean that there would be changes in the management and operation of the telecentre.

When asked about how ICTs have affected their lives, almost all the respondents would say that ICTs had an impact. The magnitude of the impact was different from each respondent. Most of the impact that was identified was related to learning and how ICTs have facilitated in gaining knowledge of their interest. Some students said it greatly aided them in getting the information they needed in their process of learning, while other students said they only used it if they had to for school assignments and did not think it really affected how they learn as their interest is not in technology. They were also asked about their opinion on how ICTs impacted their community. All the respondents identified this with the existence of the school, saying that the community's perception of Qaryah Thayyibah as a whole was divided between those who supported and those who thought it was unnecessary.

5. Discussion

The impact of ICTs for social change can be viewed in terms of access and participation of stakeholders in the harnessing of ICTs for social change in Qaryah Thayyibah. Access to ICTs can mean two things: the physical access to ICTs (connectivity) and another, more subtle and complex access, refers to economic, sociocultural, political and psychological factors that influence a person's opportunities to use ICTs [34]. Identifying access and the barriers to access provide an understanding of the impact of ICTs for social change.

A. Access

Access to ICTs is related to its usage. Based on the results of interviews and observations, the use of ICTs in Qaryah Thayyibah can be divided into 2 main categories related to development: *learning* and *networking*. These two purposes were used as a *medium for production*, which would impact on their professional development.

Using ICTs for learning could mean writing, editing a film, or drawing cartoons and maps to inform themselves or others. For the students, writing, editing and drawing also served their entertainment purposes, as the students were learning the things that they *liked* and *wanted* to learn, not what they *had to* learn as what the books or teachers told them to. For example, one student respondent liked writing as her hobby. She used the word processor in the computer to type her stories or articles. This particular student had already published almost 20 books to date. Another student was passionate about graphic design and film editing, and would spend his time on the computer editing the films that he had recorded, or learning from tutorials on graphic design and film editing that he had downloaded from the Internet. The use of ICTs for learning was also identified by other stakeholders such as the teachers and parents.

ICTs were also used by the stakeholders for networking. For the students, they were familiar with email, social networking sites, and chatting through instant messenger. One student respondent said:

> *I use the Internet for networking, talking with other students, discussing about the education system in this place. It turns out there are a lot of students out there who are interested and had a lot to say. In the future I would like to use the Internet to network with these students, to learn together, to share knowledge.*

The representative from peasant organisation also agreed that ICTs were used for networking, particularly to network with other stakeholders in the organisation. They had realised the potential of ICTs for networking since the establishment of the organisation. This was shown in an interview with the peasant organisation representative and the founder who stated that computer and Internet access had been available since day one of the organisation's operation.

Because computers and Internet were readily available in Qaryah Thayyibah, physical access to ICTs was not a significant barrier. The physical infrastructure to support ICTs such as telecommunications infrastructure and computing equipment were available in the telecentre. Furthermore, the school had come up with a computer loans scheme, where students could purchase a basic computer by giving a portion of their daily pocket money to buy the computer. In relation to that, the students who had been exposed to the ICTs from the school had valued the importance of a computer, so they financed themselves, or with their families, to purchase one for their home. Other technologies such as the Internet or gadgets such as cameras and printers were usually accessed from the telecentre.

The non-physical factors affecting access to ICTs are more complex. A person's decision and opportunity to come to the telecentre or use ICTs can be influenced by their economic status, their political power, their education level, their generation and gender [34]. Economic status and political power will not be discussed in this instance, as generalisations could not be made from the data on these factors, but education level, generation and gender will be analysed.

In the case of Qaryah Thayyibah, the students were accessing ICTs more than the adults. This could be seen in terms of generational divide. It is a common belief is that the youth have greater capacity to understand and adapt to ICTs and the dynamics they generate, compared to older people, because ICTs are *their* technologies [35]. Older people view ICTs as unnecessary and even as a significant threat, that this technology generation gap could lead to inter-generational tensions. In contrast, [36] proposed that ICTs may promote social cohesion among generations. When the adults were asked about their familiarity with ICTs, they answered that they do use the computer and the Internet for similar reasons as the children, but they were not seen to go to the telecentre to access ICTs – perhaps because they had computers at home, and preferred to access ICTs from home rather than going to the telecentre.

The students' frequent access to the telecentre could also be analysed in terms of education level. In Indonesia, as with other countries, the profile of ICTs users shows that mostly those with higher level of education access ICTs. Strictly speaking of ICTs as the Internet, the users of this technology were mainly bachelor degree students and graduates [37]. In Qaryah Thayyibah, the students were mainly children of farmers, who invested in their children's education in the hope that it would improve their families' lives, and make the children be better off than them who had lower level of education. For example, one parent was identified as a primary school graduate who enrolled his child in Qaryah Thayyibah to receive secondary level education.

B. Participation and the Relationship between ICTs and the Community

Participation refers to how much each stakeholder has an involvement in the initiative. In analysing participation of the community in Qaryah Thayyibah in relation to the telecentre, it is important to explain how the community perceived the ICTs in their community.

Qaryah Thayyibah is operated based on the concept of *lumbung daya* or resource centre. *Lumbung* is the term used for a barn in a village where farmers in the village would store their stock of produce (rice is usually the main component that was stored) as means to ensure food security in the village. This concept of collective food security had

been present in Indonesia since the 19th century [38]. D's concept of the resource centre is similar to the concept of *lumbung*, that is, collective asset management of the village. He said:

> *The Resource Centre is a medium for ... production, including information resource (print or digital) that is implemented through collective action and sharing in the community and is not for profit ... Because access to production tools are not a problem anymore, then the opportunities for community members to produce something will increase, as the fatal consequences of failure would be minimised. Other than that, community members who wanted to produce will not be faced with high investment cost. Everything becomes possible because it is based on the principle of mutual sharing and collective procurement. Furthermore, for children in primary or secondary school, the existence of this Resource Centre which mainly offers Internet facilities, would make them be able to obtain information resources easy and cheap.*

The people surrounding the learning community were part of the resource centre, the school "*still exist without a signboard* (stating Qaryah Thayyibah as a school or learning community)*, so that we do not narrow ourselves to just becoming a school*".

The concept of resource centre was familiar to all other respondents who were associated with Qaryah Thayyibah. One student on how ICTs have influenced the community:

> *The impacts are still not felt for the community. This place is actually a "*lumbung*" (barn), it provides tools for production such as how, plough, and things like that. Maybe if it is already complete like that then the impacts can be noticeable. Now there is only the telecentre, maybe the effect now is the people can access the Internet here instead of having to go to the city.*

Other respondents' answers were also focused around viewing ICTs as a tool to aid their personal development and the development of the community, as they admitted it was the principle of Qaryah Thayyibah to relate everything back to the community.

The resource centre concept was also absorbed by the federation of peasant organisations that was linked to Qaryah Thayyibah, SPPQT. A representative from SPPQT who was also a facilitator at Qaryah Thayyibah revealed how this concept is being used in the peasant organisation. SPPQT is an umbrella organisation for 55 peasant organisations in the village level (*paguyuban petani*) or hamlet level (*kelompok tani*) in Central Java. Since its establishment in 1999, Internet access had been present at least in their Secretariat. Now they have provided Internet access in the form of a telecentre in 14 peasant organisations. Internet access is used to access their website (www.sppqt.or.id), which provided information on market prices, agricultural knowledge, and also as a database for all the resources present in the organisation. The website recorded all resources, whether they were available or currently on loan, in many categories from physical goods to member skills and of course, access to Internet.

Therefore, the relationship between ICTs and the community in Qaryah Thayyibah is closely related to development of the community itself (Figure 1). ICTs are seen to be a part of the resource of the community that are used for learning and networking as a medium for production. With other resources, ICTs facilitate production of works which would aid development of their individual selves and ultimately their communities. Ability to use ICTs and produce works would also give community members life skills that they can return to the resource centre to be inventoried as part of the available resources in the village. In the resource centre concept, ICTs are part of the collective; hence its management is also done collectively. ICTs were currently managed by the students themselves, based on participatory approaches which allowed every student to become part of the management team and be responsible for the sustainability of the telecentre.
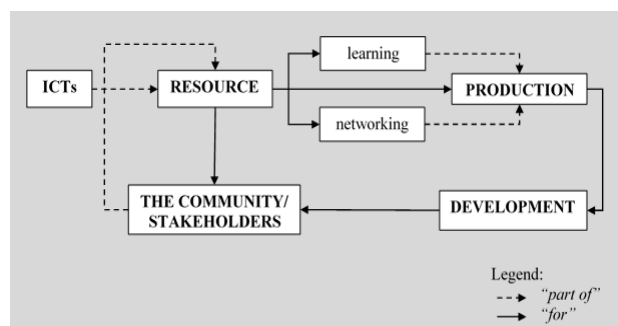

Fig. 1. A model of the relationship between ICTs and the Qaryah Thayyibah Learning Community

The resource centre concept in Qaryah Thayyibah suggests that they have appropriated ICTs and other technologies to be used for the development of the community. The community is the central focus, not the resource or the ICTs. By viewing ICTs as a resource that is collectively gathered and managed, participation of each member of the community in the management and decision-making pertaining to ICTs was ensured.

C. Impact of ICTs for community empowerment in Qaryah Thayyibah

The examination of access to ICTs, as well as participation and relationship of ICTs with the community in Qaryah Thayyibah provided the foundation for concluding the impact that ICTs had, particularly on community empowerment. These impacts are presented through a stakeholder analysis. The stakeholder analysis will elucidate the impacts of ICTs on community empowerment in Qaryah Thayyibah.

The impacts of ICTs adoption in Qaryah Thayyibah would derive from its use as a medium of learning and networking. These impacts are listed in Table 1. In relation to community empowerment, the impacts of ICTs in Qaryah Thayyibah would be how it had been a medium for production, allowing the users to innovate and create products that would enhance their development. Further analysis of impacts of ICTs can be approached using the stakeholder theory. This analysis is presented a stakeholder table and a stakeholder influence versus importance matrix in Table 2 and Figure 2.

Table 1. Stakeholders' impacts of ICTs in Qaryah Thayyibah

Stakeholder	Impacts
Student	Cost saving in gaining knowledge for learning; Contribute in professional development by gaining life skills of their interest; Increased networking and socialising opportunities with people in the global community outside their village while being able to communicate about their community with other people outside their village; Enhance participation through shared ownership and management of telecentre.
Teacher	Contribute to professional development by gaining life skills; Ability to gain knowledge.
Parent	Contribute to professional development by gaining life skills of their interest; Aid in their work: increased networking opportunities and improve management of business.
Founder	Aid in their work: increased networking opportunities and improve management of the learning community; Allow greater public awareness of the learning community, to support the development of the learning community.
Farmer organisation	Improved networking and coordination amongst other farmer organisation/members; Allow greater public awareness and visibility of organisation.
Other community members	Not yet visible.

Table 2. Stakeholder table of ICTs use in Qaryah Thayyibah Learning Community

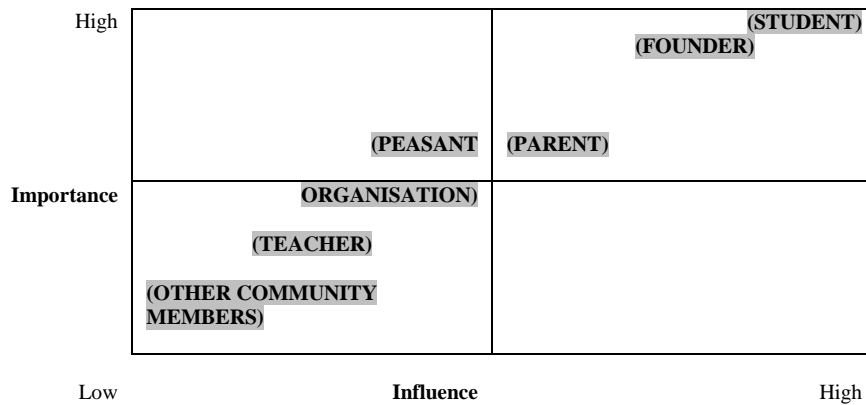| Stakeholders	Characteristics				
	Involvement in the issue	Interest in the issue	Influence /power	Position	Impact of issue on actor
Student	Main user of ICTs and operator/manager of the telecentre	High	High	Supportive	High
Teacher	Facilitate student learning	High	Medium	Supportive	Medium
Parent	Giving trust to the children to learn as they wish, be affected by ICTs as their children motivated them to	Medium	Medium	Supportive	Medium
Founder	Facilitate the adoption of ICTs in the learning community	High	High	Supportive	High
Peasant organisation	Facilitate farmers in accessing ICTs, organisation is managed, networked and become visible through ICTs	High	Medium	Supportive	High
Other community members	They have great potential as ICTs users – but so far hasn't adopted ICTs particularly in the telecentre	Low	Medium	Mixed	Low

Fig. 2. Stakeholder influence-importance matrix of ICTs adoption in Qaryah Thayyibah Learning Community

From Table 2, it was found ICTs had the most profound impacts for the students compared to other stakeholders. This can also be seen clearly in Figure 2, where the students had the highest importance and influence compared to other stakeholders. This was because the students were given a great amount of trust by the adults to control their own education, as explained by the founder of the school:

For many things we give trust to the children to decide what is best according to them, not according to teachers or parents, as long as it is not fatal or evil. The trust that we give has turned out to greatly develop the children's creativity and ability to innovate.

Those involved in Qaryah Thayyibah understood that introducing ICTs to the children make socioeconomic sense as it is a long-term investment where the benefits will be felt for a long time [9]. The trust given to this young generation, including the responsibility that they gave to them of managing and operating the telecentre, has been a landmark in the empowerment of the community. It has, shifted the power distribution by allowing the young generation to be given the experience first and then sharing with the older generation, as opposed to the elders possessing all the knowledge and transmitting it to the young [39].

However, for the remaining community members, the impacts of ICTs were yet to be seen. Access and participation in ICTs had not encompass the whole of the community. All the respondents interviewed were aware this issue and felt that to achieve full participation is a process that they are still currently experiencing. As one student said on the response of the community:

Some support and some oppose. They understand. It needs time and process to know... The most important thing is that it all comes from inside, from their own. Sure, Internet has big impacts. But in Indonesia the culture is different. For community empowerment, it depends on that. The development of culture. It all has to be appropriated to the place.

The people at Qaryah Thayyibah know that achieving empowerment need patience – an exercise that rural communities are familiar with in knowing that "things take time" [40]. As [1] have pointed out, empowerment is a long-term process, and this is recognised in Qaryah Thayyibah.

Based on the stakeholder analysis, there was another stakeholder that was identified as having high importance and influence, and this was the founder of Qaryah Thayyibah. Here the value of local champion or social innovator can be clearly seen [41]. D was an activist of the peasant organisation that enabled him to support the existence of Qaryah Thayyibah. He was also a local where his family were linked to the establishment and operation of a big *pesantren* (Islamic boarding school) in the village. Therefore he and his family were respected in the village. This also paved the way to the establishment of the learning community. Although formally educated as an Islamic teacher rather than a farmer, he was very close to the farmers of his village and was always concerned for their wellbeing, which led him to establish a peasant community organisation that would later be incorporated to the federation of peasant organisation [33]. From the interaction with the founder, it can be seen how much he influenced the whole learning community. The underlying principles and concepts applied in Qaryah Thayyibah were mostly envisioned by him. It was clear that without him as an intermediary, the process of empowerment in the community would be harder to achieve.

The existence of Qaryah Thayyibah and consequently the community's vital connection to ICTs are one that was realised from the vision of members of the community itself. The stakeholders at Qaryah Thayyibah perceived that development must start from within themselves, and thus the telecentre initiative was one that they realise together, arising from the need of having adequate information resources to assist in 'production for development'. They value this independence, as shown in the case where they turned down an offer from the World Bank to develop their telecentre because they did not agree with the funding allocations that were too strict and not focused on the community. On a discussion session with the founder, he showed documents of the World Bank funding allocation table, noting that

too much were spent for transport and remuneration for external consultants from outside the village rather than concentrating on using resources from the community. That, and the inflexibility of the project, had caused him and other stakeholders to not accept the grant that was instead given to another peasant organisation under SPPQT.

The community at Qaryah Thayyibah, at least those involved in the learning community, realise that ICTs are a resource that they need to manage together. This meant that every action related to the development of that resource must take into the consideration its effects on the development of the community. It is this notion of community ownership that would contribute to the success of a telecentre or any ICTs for development initiatives [5], [9]. [1] further identified that community empowerment is achieved when individuals and organisations from the grassroots have significant influence over agenda, design and processes, resting the locus of control to be within them and not from outside. It can be seen in Qaryah Thayyibah that they were well on their way of achieving community empowerment, albeit not all the impacts have reached every member of the community.

D. Analysing Impact of ICTs in Qaryah Thayyibah through a Stakeholder Framework

The impact of ICTs for social change in Qaryah Thayyibah was analysed using the stakeholder framework. It can be explained in the lens of descriptive, instrumental and normative stakeholder theory. Applying descriptive stakeholder theory in analysing impact of ICTs at Qaryah Thayyibah provided an understanding of the relationship between the organisation (in this case, Qaryah Thayyibah and the telecentre) and its stakeholders. This was described in Figure 2. [12] noted that in telecentre projects analysis, both the instrumental and normative stakeholder approach can also be applied. This can be applied in the case of the Qaryah Thayyibah telecentre. The normative stakeholder approach suggests that the telecentre should take all stakeholders into consideration in terms of engaging for participation and maximising the benefits for them, as a social and moral responsibility. However, taking into account *all* stakeholders may prove difficult if not impossible, as shown in the identified challenge of making the community less indifferent to the telecentre.

Applying the stakeholder framework in the investigating the impact of ICTs was also done through a series of stakeholder analysis. This proved useful for defining relationships – between the organisation and the stakeholder and also between the stakeholders themselves. The analysis was done following Brugha and Z. Varvasovszky's [20] stakeholder table (see Table 2 for the analysis in this research) and reinforced by stakeholder matrix analysing the influence and importance of each stakeholder (see Figure 1 for the analysis in this research). From this series of stakeholder analysis important issues were found, such as who experienced the most profound impact and who had not. It helped in identifying gaps and factors concerning the maximisation of impacts. For example, the students experienced the most profound impact out of their interaction with ICTs, but for other members it was not clearly felt. The value of the local champion in the establishment and sustainability of the telecentre was also identified through this stakeholder analysis. The stakeholder analysis was also useful in identifying gaps to improve and further sustain the telecentre. This can be seen from the underutilisation of the community members as a prominent stakeholder. From this gap analysis the community were made aware of the gap and could identify ways of filling it.

Overall, the application of the stakeholder framework in this research can be analysed using Bailur's [12] stakeholder framework in analysing telecentre projects. The sequence of analysis was explained in the discussion on theoretical framework. In this research, *stakeholder identification* was done in the interviews. The stakeholder analysis presented in Table 2 and Figure 2 provided an *explanation of stakeholder behaviour*, which identified gaps on *how the stakeholders work together*. The stakeholder behaviour explanation, which identified interest, influence, power, support, importance and impact were used to decide *how the stakeholders are managed* i.e. whom to inform, consult, give partnership or control. It also helped to identify in creating concessions or bargains in terms of measures to maximise the benefit of the initiative for the sustainability of the initiative and also for the stakeholders themselves. Besides for describing the analysis of this research, Bailur's stakeholder framework can also be used to further analyse how Qaryah Thayyibah considers its stakeholders. This is described in Figure 3. From the stakeholder framework, it was found that although Qaryah Thayyibah recognised its stakeholders as being important, enough measures had not been made to maximise both the telecentre and the benefits for the stakeholders themselves through thorough coalition analysis and stakeholder management.

The application of the stakeholder theory in the impact analysis of ICTs proved to be useful in revealing some prominent findings. Based on the findings, the apparent impact of ICTs in Qaryah Thayyibah were to contribute in the professional development of its users by gaining life skills that they use to create products and ultimately become empowered. The impact was felt most by the students and those directly involved in the activities at Qaryah Thayyibah Learning Community, whereas the larger community in the village were yet to experience the impacts. By having a sense of ownership of the initiative, and constant mobilising done by the local champion, the telecentre at Qaryah Thayyibah is achieving self-sustainability. In relation to that, by appropriating ICTs to adapt to their local needs, the community at Qaryah Thayyibah was on their way to reaching empowerment. The stakeholder framework provided an analysis of the impact of ICTs, which were used to answer the research question.
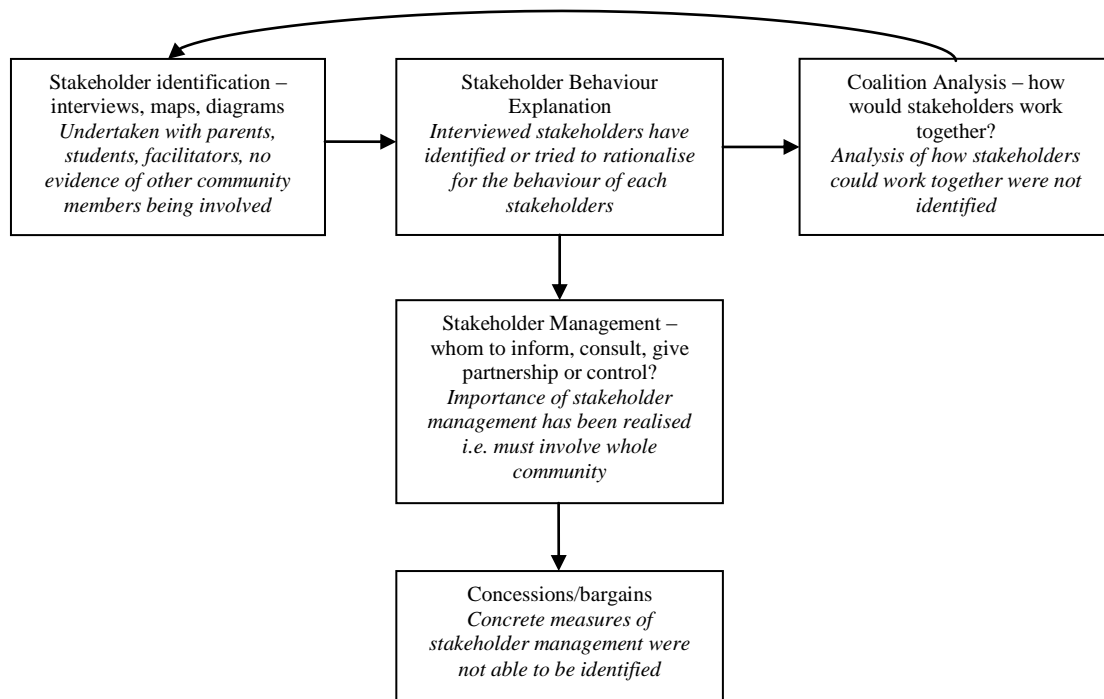
Fig.3. Application of stakeholder framework in Qaryah Thayyibah telecentre

How has the use of community-initiated ICTs in Qaryah Thayyibah affected the lives of its students and the people of Kalibening Village, especially in its goal of achieving empowerment?

In answering *how the use of ICTs affected the lives of its students,* first we identified patterns of ICTs use by the students. It was found that the students were mainly using the ICTs at their telecentre for learning and networking. The skills that they learn were not directly attained through the services that ICTs have given them; they also learnt other skills such as the management and operation of a telecentre, and learning to understand their role as agents of change in their community. Integrating ICTs with everyday learning of the students proved to be effective with the students producing many creative works out of their ability of using ICTs. It is argued that to achieve development, education is an effective tool and valuable investment, as is ICTs, so integrating both may provide positive impacts [10]. Thus, for the students, ICTs have impacted their lives and contributed to their development and empowerment, although the development is not directly affected by ICTs but the factors underlying it such as the philosophy behind its use and management.

The research question also mentioned *how the use of ICTs in Qaryah Thayyibah affected the people of Kalibening Village*. The data gathered from observations and interviews have shown that the telecentre at Qaryah Thayyibah Learning Community had yet to affect the whole of Kalibening Village. There were still people who opposed and were indifferent. However, the people involved at Qaryah Thayyibah recognised this problem and still accommodated the people by viewing that, as stated by [1] and [38], empowerment through participatory approaches is a process over time. Even though they have realised this gap, they were not able to identify concrete solutions on the way forward that would overcome the problem raising consciousness and awareness of other community members on the importance of the resource centre and the ICTs as part of it, as a medium for their personal development and the achievement of a better society.

Finally, it is noted that the ICTs initiative in Kalibening Village through Qaryah Thayyibah is pioneered by the community as opposed to externally funded. In this case, the question was if this fact made a difference in the way the community is empowered through ICTs. The Qaryah Thayyibah Learning Community had come up with the resource centre concept that views ICTs as a resource available for the whole village, in order to empower the community. This concept suggest that they have appropriated ICTs and other technologies to be used for the development of the community, and thus paving the way for community empowerment [15]. Empowerment of the community that is mediated through ICTs makes sense when ICTs are seen as a resource – a means to an end, rather than as an end in itself [42]. This can be done because the community felt they own the ICTs and the resources. With a sense of ownership comes the sense of responsibility, which would affect the sustainability of the initiative [5]. In this case, it is argued in this report that in Qaryah Thayyibah, the community had applied Heeks's *i-development* approach in maximising the impact of ICTs for the empowerment of the community by making ICTs *information-centred, integral to its environment, integrated with development objectives, intermediated, interconnected, indigenised, and above all, intelligent.* [42, p. 10]

The stakeholder analysis also highlighted another important factor that contributed to the present condition of Qaryah Thayyibah: the influence of the founder. The founder can be classified as the local champion or the innovator. The concept of empowerment that kept reiterating through the interactions with the Qaryah Thayyibah community was largely derived from his ideas. Without his support in the years from the conception of the telecentre up to present day, the telecentre would not have been able to sustain itself the way it is doing now. It is important to find out how the initiative would operate in the future if this local champion is no longer in the picture. Would the telecentre be able to sustain itself? And if so, what were the factors? Were the stakeholders mobilised enough to comprehend the importance of ICTs and progress on their own, or would other local champions emerge in the picture to keep mobilising the community? These are interesting questions to address, particularly to see how deep the consciousness-raising process had been implemented in the community.

6. Conclusion

The Qaryah Thayyibah Learning Community has successfully implemented the use of ICTs to adapt to their own environment. These uses were mainly focused around learning and networking purposes. It was revealed that ICTs served as a resource out of the many resources that they have pooled in the village resource centre. This was the key relationship between ICTs and community in relation to development; that ICTs as a resource was being used to learn and network as a medium for production. The process and end result of this 'production' would eventually empower the individual and ultimately the community. Furthermore, analysing these impacts from the perspective of stakeholder theory has shown that ICTs have impacted directly on the students. The stakeholder analysis also revealed the significance of the innovator or local champion in the Qaryah Thayyibah Learning Community who mediated the process of harnessing these ICTs; that without this innovator the initiative would not be as successful.

Analysing from the stakeholder perspective, it was also found that ICTs in Qaryah Thayyibah has yet to impact on the whole community. Even then, those involved in harnessing ICTs have realised that development is an ongoing process and that finally it must lead to a better society, so they still respected other community members' opposition or indifference towards ICTs and the learning community. Therefore, although the telecentre at Qaryah Thayyibah has yet to impact the whole community, but within the learning community there are notions of community empowerment and the process of conscientisation within the people to be able to achieve the development objectives of improving their living standards and maintaining sustainability of their environment.

This present study detailed an impact analysis of an ICT4D initiative through the lens of the people as stakeholders using the stakeholder framework. The qualitative research paradigm used was useful in explored the unquantifiable, intangible impacts of ICTs for development of the community. Further research should still focus on these intangible impacts through different lenses such as analysing the impact on culture or assessing the power dynamics and social relations. It is not an easy task to explore these topics but novel participatory methods may be useful when trying to address these issues.

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Author's Profile

Wichitra Yasya is a permanent lecturer in communication science at the Faculty of Social and Political Sciences, University of Muhammadiyah Jakarta, Indonesia. She graduated from Institut Teknologi Bandung – Indonesia with a Bachelor of Science in 2002. In 2009, She received a Master of Communication degree from The University of Queensland – Australia, specialising in Communication for Social Change. Recently in 2019 she completed her doctoral degree from IPB University – Indonesia, in the field of Communication for Rural and Agricultural Development. Her research interests are computer-mediated communication, ICTs for social change, communication for development and behaviour change communication.