

Youth and Telecentres in Community Building in Rural Peninsular Malaysia

**Bahaman Abu Samah^{1*}, Mohammad Badsar¹, Musa Abu Hassan²,
Nizam Bin Osman² and Hayrol Azril Mohd Shaffri¹**

¹*Institute for Social Science Studies, Universiti Putra Malaysia, Putra Infoport, 43400 Serdang, Selangor, Malaysia*

²*Faculty of Modern Languages and Communication, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia*

ABSTRACT

This paper aims to investigate the factors that affect telecentres in community building in the perspective of youth in rural Peninsular Malaysia. The perspective of youth on developing a model for telecentres in community building is important as: 1) youth are at the forefront of adoption of new technology, 2) youth as a group are the highest number of users of telecentres, and 3) youth are tasked with the responsibility of building up the community in the near future. This paper employed a cross-sectional survey method to achieve the study objectives. Data collected were from 313 youth randomly selected from the users of Medan Info Desa (MID) and Program Internet Desa (PID) telecentres in rural Peninsular Malaysia. The results of the Structural Equation Modelling (SEM) analyses show that the proposed model explains 47% variability on the influence that telecentres have in community building from the point of view of youth. Furthermore, all independent variables including information, telecentre and community characteristics were significantly related to the influence telecentres have in community building; characteristics related to information form the more powerful predictor. Possible measures that the government and donor agencies can implement as implied from these findings are also discussed.

Keywords: Community characteristics, community building, ICT, information characteristics, telecentre, telecentre characteristics, youth

ARTICLE INFO

Article history:

Received: 25 May 2012

Accepted: 18 January 2013

E-mail address:

drbas@ace.upm.edu.my (Bahaman Abu Samah)

* Corresponding author

INTRODUCTION

Information and communication technology (ICT) has become one of the significant driving forces of the economy, a nation's politics and its cultural and

social development. Development of ICT presents many new opportunities as it breaks down the barriers to knowledge and information exchange (Chapman & Slaymaker, 2002) and it is a major source of capacity building (Nor Iadah *et al.*, 2010). This is more specifically true for the young generation who need new knowledge, skill and abilities to help them become successful. Thus, development of ICT presents many new opportunities for young people as they are so often at the forefront in adopting technology innovation and need support so that they do not feel isolated (Gómez, Hunt, & Lamoureux, 1999, p. 15). Telecentres in rural Malaysia provide physical space that aims to improve the community's ICT literacy level and bring about access to knowledge and information resources with regards to health, agriculture, commerce, education, general development and local governance. Telecentres also raise community participation in e-commerce, e-government and online activities and, lastly, empower rural communities economically and socially via the use of ICT (Norizan, 2009). Zulkefli and Sulaiman (2009) investigated the impact of Kedai Kom telecentres on community building in Malaysia and found that it led to a general improvement in the community's well-being. They argued that "the new form of multi-channel distribution and communication of information does sustain and generate community social capital, particularly social cohesion or solidarity" (p. 83). Rural communities can work at home and at telecentres; this will help to attract

more youth to work in local areas, reducing rural youth migration to the cities (Norizan, 2009). Thus, this research focusses on youth, who form a major percentage of the Malaysian population; it also focusses on ICT that needs to be strongly linked to the aspirations of youth and the need for motivation and initiatives to effectively support youth in their empowerment.

Literature on this subject provides useful information on telecentres and ICT implementation, outcomes, (R.W. Harris, 2007; Nor Iadah, *et al.*, 2010; Paik & Kakroo, 2007; Roger, 2007; Salleh & Musa, 2008; Siti, Musa, Narimah, & Jusang, 2008; Zulkefli, Sulaiman, & Faziharudean, 2009) and sustainability (Zulkefli, *et al.*, 2009) in Malaysia. Nevertheless, there is little evidence on the effect of telecentres and ICT on community building (Nor Iadah, *et al.*, 2010; Zulkefli & Sulaiman, 2009), especially among youth. It is important to investigate the effect of telecentres on community building; Harris (2001) conducted a study on this in different countries including Malaysia, and his study further supports this view. He implied that there is a need to extend a new theory of telecentre success beyond the organisation to that of the community and to use this as a means to community building. This is consistent with Davis (2003) who looks at community technology centres as the catalyst for community changes. Davis argued that community technology centres could serve as new public places that engage diverse groups of people and contribute towards building a local community.

Harris' (2001) model of telecentre success forms the theoretical basis of this study; it is a comprehensive model that was developed based on the experiences of Asian countries, including Malaysia. Harris' model considers information characteristics, telecentre characteristics, community characteristics and context as factors influencing telecentre success which would consequently lead to community development. Thus, using the aforementioned theoretical foundation in this study, information characteristic, telecentre characteristics and community characteristics were considered as independent variables. However, context was not included in the framework of this paper. In fact, the Malaysia National Information Technology Council (NITC) started the National IT Agenda (NITA) in 1996 to provide the framework and foundation for the use of ICT and to transform Malaysia into a value-based knowledge society by the year 2020. To bridge the digital divide (BDD), Malaysia, via several ministries and private initiatives, allocated a substantial amount of investment to connect every Malaysian citizen to the internet superhighway by setting up 1,945 telecentres in all its 13 states including Sabah and Sarawak (Norizan & Jalaluddin, 2008).

According to Zahurin *et al.* (2009), a number of challenges such as lack of encouragement, imbalanced categories of users, inappropriate operation hours, insufficient IT training programmes, inappropriate physical facilities and lack of manpower plague the operations of

telecentres in Malaysia. Nevertheless, discussion on the information characteristics and telecentre characteristics is lacking. The information provided by telecentres must be demand-driven and needs to have relevant and useful content. According to Harris (2001), information should be useful, usable, local and relevant to the user's needs, and this further establishes the importance of two dimensions of information characteristics in this study, including access to local content and content relevant to community needs.

One of the important factors in explaining the effect of telecentres on community building is how the community perceives telecentre characteristics and telecentre services. From Roger's point of view, five attributes of innovation including i.e. compatibility, relative advantage, observability, complexity and trialability will explain the rate of adoption (Rogers, 2003). As mentioned by Roman (2003), three most significant perceived characteristics of innovations in the context of telecentres include compatibility, complexity and relative advantage. In this study, based on the reviewed literature, telecentre characteristics were measured in terms of telecentre location, telecentre network infrastructures and functions and type and quality of services. Location is a key factor in telecentre success (Bailey & Ngwenyama, 2009), and directly affects access and use (Etta & Parvyn-Wamahiu, 2003). Close proximity of telecentres to the users is one of the relative advantages of telecentres; it involves low-cost and saves money and

time compared to services situated far from the rural community (Kumar & Best, 2006). Telecentre network infrastructures include all the ICT equipment needed such as personal computers with servers, monitors, fax machines, video conferencing equipment, printers and scanners (Jauernig, 2003). Etta and Parvyn-Wamahiu (2003), reiterated that inadequate physical facilities pose a major obstacle to telecentre usage, while type and quality of services will promote higher usage. When users of telecentres find that the various types of telecentre services (such as e-government services, computer education, email and voice chat) are offered at lower cost and higher quality, they will prefer telecentre services to other alternatives.

In order to encourage community building through ICT, paper planning must be done on a clear understanding of the community and its social system. It is important to understand the interests, needs, constraints and aspirations of the community (Harris, 2007). Bailey (2009) argued that understanding the social context is significant in ensuring that telecentres provide appropriate services to its stakeholders. Mancini and Marek (2004) argued that understanding the community requires knowledge of community resources and needs as well as must involve key community members in programmes and show respect for community members. Thus, in this study the community characteristics are community participation, community need, and community resource and capabilities.

METHODOLOGY

The sample population of this study consisted of users of Medan Info Desa (MID) and Program Internet Desa (PID) telecentres in Peninsular Malaysia. MID centres were established with the objective of encouraging community ownership, empowerment and sustainability. The concept of the MID project is based on a government-led and community-managed model. PID, on the other hand, aimed to provide computing facilities to increase computer usage among communities residing in the rural parts of the country (Nizam, 2005). This study selected youth as respondents as they represent a large percentage of the Malaysian population. Often, youth are at the forefront in adopting technology innovations, and it is important to link ICT to youth community aspirations, motivation and initiatives to effectively support their empowerment. The multi-stage cluster sampling method was used to select the study sample. In the first stage, the four states of Perak, Kedah, Terengganu and Johor were randomly selected to represent central, northern, east coast and southern Peninsular Malaysia, respectively. In the second stage, three criteria were selected, namely, being active, possessing enough experience and with at least three years of activity to form the basis of choice of telecentres in the selected states. The cut-off point of users' age was decided according to Mohammed (2004) who defined youth in Malaysia as individuals whose ages are from 16 to 40 years. Finally, the data collected from 313 users of MID (48.6%) and PID

(51.4%) telecentres in rural Peninsular Malaysia were randomly selected from the 12 MID and 11 PID telecentres respectively.

The survey instrument consisted of demographic information and four constructs. Whyte (2000) and other relevant literature provide the basis for developing the information characteristics and community characteristics scales. The information characteristics scale investigates accessibility and relevance of information. The community characteristics scale incorporates community resources, needs and community participation. Three main sources namely Whyte (2000), Prado (2009) and Akbulut *et al.* (2007) were the basis for developing the telecentre characteristics scale. The telecentre characteristics scale includes location, infrastructure and type and quality of services. The telecentre community building scale was based on Ferlander (2003), which Zulkefli and

Sulaiman employed in a recent study (2009). The community building scale consists of items such as “Improve work related skills” and “Find employment/ job creation”. Since the instruments were adopted from various sources, special consideration was taken to ensure the face and content validity of the instruments. A panel of experts consisting of academicians from the Institute for Social Science Studies, Universiti Putra Malaysia, endorsed the face and content validity of the instruments. In addition, this study utilised the Structural Equation Modelling (SEM) to assess the construct validity of the instruments. Convergent validity of each construct was assessed using the first-order CFA; the results show an acceptable level of construct validity, in which all standardised factor loadings and the average variance extracted (AVE) were more than .5. The measurement model was used to check the discriminant validity of constructs.

TABLE 1
Distribution of Respondents by Gender, Age and Level of Education (n= 313)

Variables	Frequency	Percentage
Gender		
Male	140	44.7
Female	173	55.3
Age (mean=22.13)		
16-25 years	238	76
26-35 years	75	24
Educational qualification		
Never been to school	1	.3
Primary school	3	1
Lower Malaysian certificates (PMR)	20	6.4
Malaysian education certificates (SPM)	150	47.9
Higher Malaysian education certificates (STPM)	49	15.7
Diploma	54	17.3
Bachelor's degree (Ijazah)	36	11.5

RESEARCH FINDINGS

Profile of Respondents

Table 1 shows that more than half (55.3%) of the respondents were females, while 44.7% were males. Out of 313 respondents, a good majority (76%) were in the age group between 16 and 25 years old, and 24% were in the age group between 26 and 35 years old, and the average of the respondent age was 22.13 years. With respect to respondents' educational qualification, the majority (71.2%) were below diploma level. Nearly half (47.9%) of the respondents had SPM (Malaysian Certificate of Education) qualification and only 17.3% of the respondents had diploma or degree qualifications (Table 1).

The Measurement Model

Before evaluating the fittingness of the structural model, it was necessary to define a measurement model to verify the construct validity of each research instrument which comprised individual indicators. For this purpose, this study employed CFA to assess the structural model fit, convergence validity and discriminate validity. Based on the Goodness-of-Fit indices, a measurement model test reveals a relatively good fit between the data and the proposed measurement model. Assessment of the measurement model indicated that although the model did not fit well with the significant chi-square (1374.684, $p > .05$) test, the baseline comparisons fit indices of CFI (.907); IFI (.908) and TLI (.900) significantly exceed the minimum cut-off

value (0.9). In addition, the RMSEA was 0.053, which falls within the recommended range of acceptability (between 0.03 and 0.08) (Hair, Black, Babin, & Anderson, 2010). This proves that the measurement model has a good fit with the data.

The convergent validity of the instrument was also verified based on standardised factor loading, average variance extracted (AVE) and construct reliability (CR). The results showed that all indicators of each latent construct had high standardised factor loadings (values ranged from 0.560 to 0.895), and all were significant at 0.001. The AVEs for all constructs exceeded the minimum criterion of .50, indicating that indicators (Table 2) explain most of the variances. Further, the construct reliabilities were more than 0.7 for all the constructs indicating a high internal consistency among the indicators (Table 2).

The results of correlation estimates between the constructs in the measurement model, revealed a significant correlation between the constructs in the model. The results also showed that the squared of correlation estimates between two constructs were less than AVE for each construct and portrays a high discriminant validity of measure constructs verified.

The hypothesised Telecentre in Community Building Model Among Youth

The Structural Equation Modelling (SEM) was used to examine the contribution of each independent variable (information characteristic, telecentre characteristic and community characteristic) toward

TABLE 2
AVE, Correlations and Construct Reliability Estimates

Variable	AVE	1	2	3	4
1. Information characteristics	.624	.929			
2. Telecentre characteristics	.500	.480***	.868		
3. Community characteristics	.532	.468***	.700***	.919	
4. Community building	.590	.436***	.616***	.579***	.920

Note: *** P<.001; Diagonal elements are construct reliabilities

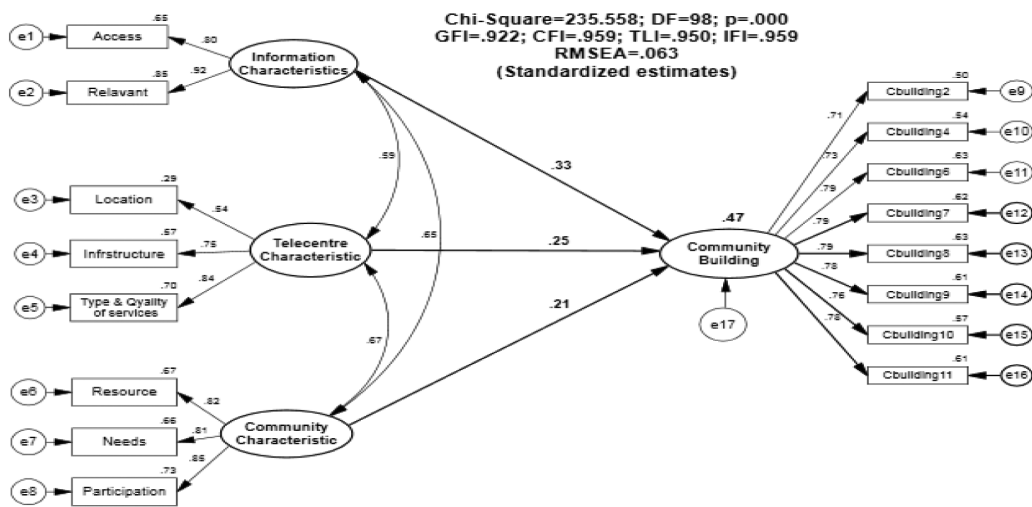


Fig.1: Hypothesized Telecentre in Community Building Model Among Youth with Standardised Estimates

the prediction of telecentres community building among the youth. The results as presented in Figure 1 indicated that the data fit the model with; χ^2 (98)=235.558, $p=.000$, $GFI=.922$, $CFI=.959$, $TLI=.950$, $IFI=.959$, $RMSEA=.063$. The Goodness-of-Fit indices of structural model showed that the GFI, CFI, TLI and IFI significantly surpass the cut-off value (0.9). In addition, the RMSEA was 0.063, which is less than the recommended (0.08).

The hypothesised telecentre community building model among the youth comprised the following hypotheses.

H1: There is a significant relationship between information characteristics and telecentres in community building among the youth. As illustrated in Figure 1 and Table 3, the information characteristics’ latent construct (consisting of two parcelled indicators, namely, access to local content and content relevant to respondents’ needs) was found to have a significant relationship with telecentres in community building ($\beta=.329$, $C.R.=4.533$, $p=.000$). The result showed that when an information characteristic goes up by 1 standard deviation, community building

goes up by 0.329 standard deviations. Thus, the results supported H1. This finding concurs with the results of previous research which considered access to local content and content relevant to community needs as critical for telecentre success (Bailey & Ngwenyama, 2009; Best, Thakur, & Kolko, 2009; Colle, 2004; Etta & Parvyn-Wamahiu, 2003; Islam & Hasan, 2009). Thus, to be meaningful in the daily lives and work of youth in rural communities, ICT projects must incorporate relevant content (Bridges, 2006).

H2: There is a significant relationship between telecentre characteristics and benefits of telecentres to community building among youth. The results in Fig.1 and Table 3 show that there is a significant relationship between telecentre characteristics' latent construct (including three parcelled indicators of infrastructure, type and quality of services and location) and telecentres in community building ($\beta=.250$, C.R.=3.236, $P=.001$). Therefore, these findings supported H2.

Consistent with present research results on the significant role of the location dimension of telecentre characteristics in community building, Ngwenyama (2009) emphasised that location is a key factor for telecentres to succeed. This finding also supports an earlier research by Kumar and Best (2006) which claimed that spatial location and operation of telecentres can significantly improve their social diffusion. The infrastructure dimension of telecentre characteristics that is important in explaining the benefits that telecentres offer

in terms of community building is further supported by a study by Meddie (2006) that indicated that the key factor for success and sustainability of telecentres is availability of infrastructure. Based on a sample of 60 ICT project supervisors in rural areas of Malaysia, Jusang *et al.* (2009) revealed that the success and failure of an ICT project largely depends on increased equipment. Furthermore, the findings of this study on the influence of type and quality of services are congruent to Best *et al.*'s (2009) findings that indicated that one of the main reasons which lead to sustainable realisation of telecentre objectives is appropriate services provided by telecentres. Based on their study on Malaysian telecentres, Zahurin *et al.* (2009) indicated that good delivery and quality services will contribute towards telecentres' success and sustainability.

H3: There is a significant relationship between community characteristics and usage of telecentres in community building among youth. The results of the structural model, as depicted in Figure 1 and Table 3, indicated that there was a significant relationship between telecentre success and community characteristics' latent construct that comprises three parcelled indicators i.e. community resources and capabilities, community need and community participation in community building ($\beta =.209$, C.R.= 2.675, $p=.007$). Therefore, these findings support H3. These results support previous research findings that focussed on relationships between the community characteristics (such as considering the community needs

and resources) and telecentre success or sustainability (Bailey & Ngwenyama, 2009; Clark, 2001; Gnaniyah, Yeo, Songan, Zen, & Hamid, 2004; R. W. Harris, Kumar, & Balaji, 2003; Rideout & Reddick, 2005; Roman & Colle, 2002; Simpson, 2005). Further, the results on the relationship between participation as a dimension of community characteristics and telecentre community building are supported by Rao (2008) that establish that the success of telecentres in the community is dependent on community participation (Rao, 2008). Consequently, telecentres would not be able to establish community building if there were no programme meeting the needs of the community at large (Norizan & Jalaluddin, 2008) and no participation among them.

CONCLUSION

The research framework provides evidence in support of a theoretical framework that predicts that telecentres contribute to community building by explaining a 47% variance. Therefore, we can conclude that telecentre activities and resources could

strengthen the skills and abilities of youth to take effective action and leading roles in developing their communities or in community building.

Among the factors that influence telecentres' contribution to community building are the information characteristics that show the highest standardised regression weight ($\beta=.329$) and had the highest significant contribution in predicting that telecentres influence community building among youth. Thus, although ICTs are powerful tools of information dissemination, to achieve the target of community building through ICT usage, telecentres must provide information that is local and relevant to human resources and capital among young people who form a major percentage of the Malaysian population. Information can empower young people to participate in decision-making, exchange ideas with their digital peers and improve the quality of life of the people. Further, the significant contribution of telecentre characteristics to community building imply that telecentre locations, appropriateness of infrastructure and adequate type and quality of telecentre

TABLE 3
Regression Weights in the Direct Hypothesised Telecentre Community Building Model Among Youth

Hypothesised relationships	Unstandardised regression weights B	S.E.	Standardized regression weights Beta	C.R.	P
Information characteristics → Community building	.240	.053	.329	4.533	.000
Telecentre characteristics → Community building	.271	.084	.250	3.236	.001
Community characteristics → Community building	.173	.064	.209	2.675	.007

services are influential in community building in the perspective of youth.

In the point of view of youth, the significant relationship between community characteristics and the influence of telecentres in community building show that rather than merely provide technological systems, donor agencies should focus on understanding the community's needs, capabilities, resources and, more importantly, community participation from the planning stage of telecentre establishment up until the community can manage telecentres independently. Therefore, it is crucial that the telecentre team works closely with the community, especially the young generation, in order to develop rapport and trust.

This study is important in bridging the gap in the body of knowledge pertaining to the benefits that telecentres have on community building by establishing valid and reliable criteria as indicated in the measurement model; although there has been a rising volume of literature on telecentres, most of it only covers telecentres' success at the organisational level and in meeting the objectives of telecentres. The findings of this study can be discussed with donor and government agencies involved in the development-oriented telecentres; these agencies should consider the information on telecentre and community characteristics which youth view as critical. The results of such a consideration are beneficial to various groups that are directly or indirectly involved in the planning, execution, evaluation and use of ICT projects to enhance greater usage of telecentres in community building.

REFERENCES

- Akbulut, Y., Kesim, M., & Odabaşı, H. F. (2007). Construct validation of ICT indicators measurement scale (ICTIMS). *The International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 3(3), 60-77.
- Bailey, A. (2009). Issues affecting the social sustainability of telecentres in developing contexts: A field study of sixteen telecentres in Jamaica. *The Electronic Journal on Information Systems in Developing Countries*, 36(4), 1-18.
- Bailey, A., & Ngwenyama, O. (2009). *Social ties, literacy, location and the perception of economic opportunity: Factors influencing telecentre success in a development context*. Paper presented at the Proceedings of the 42nd Annual Hawaii International Conference on System Sciences, HICSS.
- Best, M. L., Thakur, D., & Kolko, B. E. (2009). *The contribution of user-based subsidies to the impact and sustainability of telecenters—the eCenter project in Kyrgyzstan1*.
- Bridges. (2006). Real access/Real impact criteria. Retrieved from http://www.bridges.org/Real_Access
- Chapman, R., & Slaymaker, T. (2002). *ICTs and Rural Development: Review of the Literature, Current Interventions and Opportunities for Action*. London Overseas Development Institute.
- Clark, J. (2001). Promoting participation in telecentres. *Journal of Development Communication -- Special Issue on Telecentres*, 12(2).
- Colle, R. D. (2004). *ICTs, telecenters and community development*. New York, USA: Department of Communication Cornell University.
- Davies, S., Schwartz, A., Pinkett, R., & Servon, L. (2003). A report to the Ford Foundation: Community technology centres as catalyst for community change. *A Report to the Ford*

- Foundation. New School University Retrieved October, 25, 2003.
- Etta, F., & Parvyn-Wamahiu, S. (2003). Information and communication technologies for development in *Africa. Vol. 2: The Experience with Community Telecenters*. Ottawa: the International Development Research Centre (IDRC).
- Ferlander, S. (2003). *The Internet, social capital and local community*. Scotland: The University of Stirling, Department of Psychology Scotland.
- Gnaniah, J., Yeo, A., Songan, P., Zen, H., & Hamid, K. A. (2004). A comparison of the implementation approaches for the e-Bario and e-Bedian Project *Paper presented at the Seventh Conference on Work with Computer Systems*.
- Gómez, R., Hunt, P., & Lamoureux, E. (1999). *Telecentre evaluation and research: A global perspective*. Ottawa, Canada: International Development Research Centre.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*.
- Harris, R. (2001). Telecentres in rural Asia: Towards a success model. *Europe*, 40(23.4), 13.17.
- Harris, R. W. (2007). Telecentre evaluation in the Malaysian context *Paper presented at the 5th International Conference on IT in Asia*.
- Harris, R. W., Kumar, A., & Balaji, V. (2003). Sustainable telecentres? Two cases from India. In S. Krishna, & S. Madon (Eds.). *The digital challenge: Information technology in the development context*. (pp. 124–135).
- Islam, M. S., & Hasan, M. N. (2009). Multipurpose community telecentres in Bangladesh: Problems and prospects. *The Electronic Library*, 27(3), 537-553.
- Jauernig, C. (2003). Review of telecenter sustainability criteria for the establishment of sustainable rural business resource centers for SMEs in developing countries. *United Nations Industrial Development Organization (UNIDO)*, Vienna.
- Jusang, B. B., Musa, A. H., Narimah, I., & Siti, Z. O. (2009). Projek ICT di luar bandar: Saranan dalam menjana pembangunan k-masyarakat. In D. Bahaman & e. al (Eds.), *Media dan pengembangan pertanian: usaha ke arah memperkasakan komuniti luar bandar* (pp. 67-75). Serdang, Selangor: UPM.
- Kumar, R., & Best, M. (2006). Social impact and diffusion of telecenter Use: A study from the Sustainable Access in Rural India Project. *The Journal of Community Informatics*, 2(3).
- Mancini, J. A., & Marek, L. I. (2004). Sustaining community-based programs for families: Conceptualization and measurement*. *Family Relations*, 53(4), 339-347.
- Meddie, M. (2006). Rethinking telecentre sustainability: How to implement a social enterprise approach - lessons from India and Africa. *The Journal of Community Informatics*, 3(2).
- Mohammed, A. R. (2004). Youth and Globalism: A Perspective: World Assembly of Youth.
- Nizam, M. O. (2005). *Information and Communication Technology policies in Malaysia: Analysis of government measures to minimise the digital divide*. Paper presented at the National Conference Towards Development of e-Malaysia: Minimizing the Digital Divide through the use of Information Technology. Palm Garden Hotel IOI Resort, Putrajaya, Malaysia.
- Nor Iadah, Y., Shafiz, A. M. Y., Zahurin, M. A., Huda, H. I., Khairudin, M. K., Zulkhairi, M. D., et al. (2010). The influence of community characteristics towards telecentres success. *Computer and Information Science*, 3(2), 116.
- Norizan, A. R., & Jalaluddin, A. M. (2008). Bridging digital divide in Malaysia: Cyber learning for the marginalized community.

- Paik, S., & Kakroo, U. (2007). Telecentres and community life; Encouraging a 'K'-based economy... Malaysia. *Information for Development*, 14(1), 14-16.
- Prado, P. (2009). *Bridging digital poverty: Adoption of information and communication technologies at community technology centers in the Dominican Republic*. (Unpublished doctoral thesis). Florida, United States: University of Miami.
- Rao, S. S. (2008). Social development in Indian rural communities: Adoption of telecentres. *International Journal of Information Management*, 28(6), 474-482.
- Rideout, V. N., & Reddick, A. J. (2005). Sustaining community access to technology: Who should pay and why. *The Journal of Community Informatics*, 1(2), 45-62
- Roger, W. H. (2007). Telecentre evaluation in the Malaysian context. Paper presented at the 5th International Conference on IT in Asia.
- Roman, R., & Colle, R. (2002). Themes and issues in telecentre sustainability. *Institute for Development Policy and Management*, Manchester: University of Manchester.
- Salleh, M. H. H., & Musa, A. H. (2008). Rural ICT in Malaysia: Exposure, accessibility and usage. In M. N. Osman, S. Z. Omar, H. Hassan & N. Ismail (Eds.). *Dimensions of communication: Malaysian experience* (pp. 110-125). Serdang: UPM.
- Simpson, L. E. (2005). Community informatics and sustainability: Why social capital matters. *The Journal of Community Informatics*, 1(2), 102-119.
- Siti, Z. O., Musa, A. H., Narimah, I., & Jusang, B. (2008). Faktor-faktor kejayaan dan kegagalan projek ICT di luar bandar [Success and failure factors of rural ICT projects]. *Pertanika Journal of Social Sciences & Humanities*, 16(2), 173-186.
- Whyte, A. (2000). *Assessing community telecentres; Guidelines for researchers*. Canada: International Development Research Centre.
- Zahurin Mat Aji, Ibrahim, H. H., Kasiran, M. K., Yusop, N. I., Yusof, S. A. M., & Dahalin, Z. M. (2009). Management Practice Sustaining Telecentres.
- Zulkefli, I., & Sulaiman, A. (2009). The influence of Malaysian telecenters on community building. *Electronic Journal of e-Government*, 7(1), 77-86.
- Zulkefli, I., Sulaiman, A., & Faziharudean, T. M. (2009). The roles of community based telecenters in bridging the digital divide in rural Malaysia. *International Journal of Humanities and Social Sciences*, 3(1).