

MICRO ENTREPRENEURS' ADOPTION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) FOR RURAL DEVELOPMENT: EVIDENCE FROM SMALL SCALE POTTERY BUSINESS OF KUALA KANGSAR, MALAYSIA

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Abstract

The advent of Information and Communication Technology (ICT) has profoundly impacted human behaviour, revolutionizing various aspects of life, including business operations. Rural Micro Entrepreneurs (RMEs) were said to gain significant economic benefits from the adoption of ICT in their business including increased productivity, sales, marketing, and ultimately higher income. However, not all rural entrepreneurs effectively leverage ICT advancements to enhance their businesses, prompting a need for further investigations. Derived on quantitative approach i.e., questionnaire guided interview processes, a series of field study have been conducted on March to April 2023, focusing on seven main rural pottery businesses from five villages in the Kuala Kangsar district, Perak. The primary objective is to assess the level of ICT usage among RMEs and identify the factors that motivate the utilization of ICT facilities. The study highlights that majority of respondents acknowledged the importance of ICT that allows flexibility to conduct business alongside with time and cost savings. By embracing ICT, RMEs in the study area not only improve their business efficiency, but also contribute to the overall local economic development. The findings of this study highlighted the opportunities for enhancing ICT adoption among RMEs for local economic development.

Key words: Rural Micro Entrepreneurs, ICT, pottery business, community business, local economic development

INTRODUCTION

There is less doubt that the continuous progression of Information and Communication Technology (ICT) has fostered transformative changes in both urban and rural livelihoods. ICT has enhancing interpersonal connectivity; moreover, has redefined the landscape of business practices. Research conducted by [16] illuminated how the utilization of ICT has empowered local entrepreneurs, particularly within the realm of rural and small-scale business. For a rapidly growing economy like Malaysia's, small and medium-sized enterprises (SMEs) play a pivotal role in bolstering the nation's industrial foundation and reducing reliance on the often-volatile global economic landscape. According to [4], in year 2020, SMEs have emerged as significant contributors to employment and economic growth. Notably, nearly 98.5% of the Malaysian economy

comprises SMEs, contributing a substantial 38.3% to the country's Gross Domestic Product (GDP), generating 66% of its employment opportunities, and accounting for approximately 17.3% of Malaysia's total exports [12]. Despite substantial contributions and potential to drive local economic development, especially in rural areas, many entrepreneurs continue to grapple with challenges when it comes to embracing and effectively leveraging ICT to expand their products and services within both local and global markets [5, 7]. These challenges often stem from the lack of awareness and training on the usage of ICT in SMEs, poor infrastructure and inconducive business environment to encourage the usage of ICT [13, 16]. Consequently, there is a pressing need for comprehensive research to examine the factors influencing the adoption of ICT among rural entrepreneurs. Such research should also identify the influential factors to

enhance preparedness among rural SME operators to employ ICT facilities for sustainability of their businesses.

Literature review

Rural SMEs in Malaysia Context

Small Rural Industry, also known as Rural Industry or Small Industry, is an industry that plays a significant role in prospering the country's economic growth and driving the rural growth. Rural Industry is an industry that is entirely small-scale and an enterprise that is largely run by salaried workers. A classic study by [6] found that SMEs are companies that employ no more than five workers who do not use machinery or 20 industrial workers who use machinery.

The interpretation by the Ministry of Urban and Rural Development sees Rural Industry as a small-scale industry, driven by rural communities with no more than five permanent employees and no more than RM 250,000 in shares [16]. This enterprise is complementary to medium and large-sized industries/ enterprises, most of which use more advanced production processes and their organizations are more developed due to technological improvements. Village industries or micro enterprises may be owned and operated by individuals, groups or the entire village community through cooperatives or companies in the form of limited partnerships or limited companies or joint ventures [17]. Village industry also uses simple machinery to attract the involvement of the villagers [11].

According to [16], village industry is defined as an enterprise located in the village, worked by the village community to produce simple traditional or modern goods. This industry may be carried out individually and/or in groups through cooperatives or manufacturing companies [11]. SMEs have the importance of driving the economic development of the people because they can accelerate local economic growth by creating local jobs for the people in their communities [2]. Based on the above discussions, it is clear that small/micro enterprise a small-scale industry that is thought suitable to meet the demand or response from the rural population. This industry is operating in strong considerations

of local community's need including providing jobs for local people, utilising local natural resources and facilities, and in return, providing income to the local households [8].

Table 1. Main Characteristics of Rural Micro Enterprise (RME)

Characteristic	Explanations
Organisational System	RME has a simpler, small-scale, less bureaucratic and less formal organisational system because the RME organisational system does not involve a large number of employees and mainly consist of family members or relatives or neighbours.
Industrial Location	RME can be located and operates in entrepreneur's own home or in a workshop built in their residential area/living vicinity. However, cost and equipment are also influencing the entrepreneur's choice for the location of RME. For instance, there are entrepreneurs who are looking for cheap industrial area lots close to the city to make it easier for them to reach customers/markets.
Workforce	RME can be a newly set up enterprise and/or a family inherit enterprise and is run either full-time or part-time. This enterprise does not require a large workforce; therefore, entrepreneurs can run the RME as a sole ownership. They often received assistance from family members, indirectly reducing expenses or costs for employee wages.
Capital	Due to the industry being run on a small scale, RME enterprises mostly require small capital and often using their own savings and with some supports from government agencies (small amount development grants, etc.). Most entrepreneurs obtain raw materials from their own gardens, or local producers and smallholders.
Training Support for Entrepreneurs	Occasionally, RMEs entrepreneurs in rural areas received training from relevant agencies for improving their staff management, financial cashflow as well as product marketing through branding and the usage of ICT.
Workers	It is common for RME to employ workers among men and women who have skills needed to boost their products making and services such as making mats, handicrafts, weaving, batik, preparing and cooking dishes and so on. By engaging in RME as an entrepreneur or employee, workers among rural women she can fill her spare time as a housewife who does not work indirectly and can also contribute additional income for their household.
Production Technology and Product Market	The level of technology/high-tech machines usage for RME production is low, remain mostly as labour-intensive. This is because not all rural entrepreneurs get help using technology from related agencies. For the use of high-tech machines, it requires a large capital, skills and training to acquire and operates which most of RME did not possess big financial capital.

Source: [8, 9, 10, 16, 17, 18]

A study by [3] found that rural micro enterprise (RME) is an industry located at the bottom of the hierarchy whereby this hierarchy is measured based on the total number of employees which is less than five

people. Furthermore, RME can be determined and/or distinguished it from other type of industries based on certain characteristics such as organisational system, industrial location, workforce, capital, training and support, production technology and market (Table 1).

In many situations, RME produces their products using local raw materials, with low usage of modern technology and highly dependent on traditional skills. RME also requires low investment or capital but produces quick returns from the products. Among the types of RMEs are handicrafts, weaving, carving, embroidery, small-scale food processing or manufacturing enterprises such as making crackers, soy sauce and so on [11, 16].

ICT Application for Rural Micro Enterprise Development

Information and Communication Technology (ICT) plays an important role in rural development. The definition of information technology can be summarised as a process of flow, dissemination, processing and storage of information using technological means [16]. In the context of development, ICT refers to the use of technology such as the internet, mobile devices, computers, software, and applications to speed up and improve access to information and communication. In an empirical study by [14], it was found that ICT is able to offer enterprises various possibilities to increase competitiveness such as providing mechanisms to gain access to new market opportunities and specialised information services. According to [1], ICT usage can potentially improve information and knowledge management within firms and increase the speed and reliability of transactions for both business-to-business (B2B) and business-to-consumer (B2C) transactions. The opportunities offered by ICT were promising, whereby organizations can exchange real-time information and build closer relationships with suppliers or business partners and customers. This study also found the possibility of immediate customer feedback according to customer demand in new markets. The use ICT is important for RMEs business sustainability and several

factors that influence the use of ICT by RMEs are shown in Figure 1.

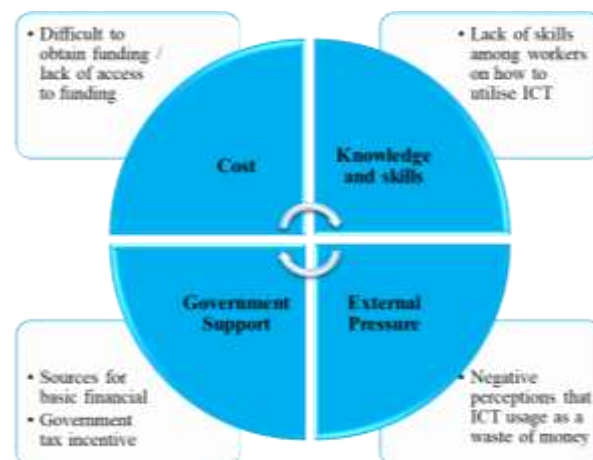


Fig. 1. Factors influencing the low usage of ICT among RMEs.

Source: [1, 9, 10, 14, 16].

Based on the above figure, the four main influential factors or considerations for ICT usage among RMEs are related to the cost, possession of relevant knowledge and skills, government support and external pressure. It seems that RMEs are struggling with lack of access to funding for ICT, followed by lack of skills among workers to use ICT on regular basis, lack of government support for encouraging RMEs to use ICT and negative connotations towards ICT usage by the RMEs. It can be summarised that RMEs require an improved access towards funding, provision of appropriate ICT training, government tax incentive to boost ICT adoption and promote positive perception on the benefits of ICT investment for RMEs long-term sustainability.

MATERIALS AND METHODS

Study Area of Kuala Kangsar, Malaysia

This research focuses on a comprehensive examination of five key villages in the Sayong area of Kuala Kangsar, Perak, Malaysia: Kampung Kepala Bendang, Kampung Bukit Lada, Kampung Sayong Tengah, Kampung Sayong Masjid, and Kampung Sayong Hulu. The selection of this specific region is underpinned by the vibrant presence of Rural Micro Enterprises (RMEs) and dedicated entrepreneurs actively involved in craft

pottery production. Notably, these villages are renowned for their significant contributions to the art of clay pottery, particularly the famous "Labu Sayong," a craft that has gained national acclaim [8].

Situated in the Royal Town of Kuala Kangsar, recognized as the Heritage Art District in Perak, these villages hold a unique position in the cultural and artistic landscape of the region. Their proximity to each other fosters a rich collaborative environment, facilitating the exchange of knowledge and skills within the local community. Furthermore, their strategic location, merely 5 km away from the town of Kuala Kangsar, ensures convenient accessibility, with a short 10-minute drive by car, as illustrated in Map 1.



Map 1. Location of seven (7) RMEs craft-based located in Kuala Kangsar District, Perak.
 Source: Research fieldwork [15].

Based on the data provided by the Malaysian Handicraft Development Corporation, there is a total of 11 small-scale pottery entrepreneurs registered and operated within the study area. Among them are Musmus Enterprise, KZ Craft Enterprise, Harun Pottery and Suriadin Enterprise, Jeyzek Enterprise, Abdul Manan Cams Craft, Era Seramik, Awie Craft, Win Craft, Xtream Craft Deco N Pottery and KT Craft Enterprise. From the above explanations it can be summarised that the selected study area is considered as pioneers in the production of Sayong pottery and handicrafts which is quite famous in Kuala Kangsar in particular, and in Malaysia in general. Furthermore, the Sayong pottery representing a high cultural value and is an important cultural heritage for the local community and is part of the local identity in the study area and has been regarded by rural researcher

such as [8] as fulfilling the characteristic of a One Village One Product approach. Out of 11 RME pottery operators, seven of them were agreed to be interviewed during the questionnaire survey conducted between March to April 2023 (Table 2).

Table 2. List of RME pottery operators which participated in the research

Location (Map 1)	Name of enterprise
1	KT Kraf Enterprise
2	Xtream Craft Deco N Pottery
3	Win Craft
4	Era Seramik
5	Jeyzek Enterprise
6	Harun Pottery
7	Musmus Enterprise

Source: Research fieldwork [15].

Methodology

In this research, a quantitative approach was employed for both data collection and analysis. The researchers used a questionnaire-guided interview as the main instrument for data collection. The questionnaires were distributed to respondents consisted of the owner/operator of rural enterprises during visit to their craft outlets in Sayong area. Initial data, sourced from the Malaysian Handicraft Development Corporation, revealed the presence of 11 registered Rural Micro Enterprises (RMEs) within the study area. Given the small number of respondents, researchers had planned for a census study. However, it is worth mentioned that during the fieldwork phase, four respondents were unable to participate due to a variety of commitments, leading to their exclusion from the survey.

Consequently, the study garnered valuable responses from the remaining seven respondents, representing an impressive 64% of the total registered pottery operators in Sayong area. This high participation rate significantly enhances the study's credibility and reliability.

The data collection procedure involved researchers' visit to every premise (pottery making workshop) for conducting a questionnaire-guided interview session the respective RME operators. The survey questionnaire encompasses three primary

sections. The first section contains profile of respondents and background of RME. Meanwhile, the second section determines factors that influence/motivate respondents to utilise ICT for their business and factors which hinder the usage of ICT. The third section included the respondents' suggestions on the physical and non-physical needs for enhancing the usage of ICT by RMEs in the future.

For the data analysis, the researcher employed the descriptive statistical analysis method, utilising the SPSS software to extract essential statistical parameters such as percentage values, mean scores, and median values from the collected data. Descriptive statistical analysis serves the purpose of characterising variables and facilitating conclusions drawn from numerical data. The mean or average score analysis involves computing the average value from a given score distribution. This calculation aims to ascertain the typical performance level or achievement attained by an individual or group in a particular measurement or assessment. It provides an overall overview of performance levels and/or for ranking of various indicators or factors influencing the usage of ICT among respondents (Table 3).

Table 3. List of RME pottery operators which participated in the research

Mean Score Range	Category / Level
0.0 – 1.0	Very low influence
1.1– 2.0	Low influence
2.1 – 3.0	Moderate influence
3.1 – 4.0	High influence
4.1 – 5.0	Highly influential

Source: Research Fieldwork [15].

RESULTS AND DISCUSSIONS

Profile of Respondents

The participants in this study, comprising 64% of the total registered pottery entrepreneurs in the Kuala Kangsar district, are detailed in Table 4. All respondents are of Malay ethnicity (100%), with four (57%) being male and the remaining 43% female. These findings highlight the substantial contribution of women entrepreneurs to the operation of rural pottery businesses.

Table 4. Profile of respondents (all villages, n=7)

Question	Answer	Frequency	Percentage
Gender	Male	4	57.0
	Female	3	43.0
Age category	26-35 years	1	14.0
	36-45 years	5	72.0
	46-55 years	1	14.0
Race	Malay	7	100.0
Origin	Born and raised here	7	100.0
Year of business operation	10-15 years	5	71.0
	More than 15 years	2	29.0

Source: Research Fieldwork [15].

The majority of respondents, constituting 72%, belong to the age category of 36-45 years, followed by those aged 26-35 years and 46 and above, each comprising 14%. Additionally, all respondents were born and raised in Sayong and the Kuala Kangsar district, underscoring their deep connection and pride in local pottery-making businesses. The survey reveals that a significant portion (71%) of these entrepreneurs has been engaged in the pottery business for 10-15 years, while the remaining 29% boast more than 15 years of experience, signifying the resilience and enduring relevance of these Rural Micro-Enterprises (RMEs).

As shown in Table 5, prior to engaging in Rural Micro-Enterprises (RMEs), specifically the pottery-making business, none of the respondents reported a monthly income exceeding RM2501. Instead, 42.8% earned an income within the range of RM751-RM1000, followed by those with incomes below RM750 and between RM1001-RM2500, each accounting for 28.6% of respondents. In contrast, after embarking on RMEs, a significant majority now enjoy monthly incomes surpassing RM1000, including 14.3% who receive incomes between RM4851-RM11000. The remaining income categories are RM1001-RM2500 and RM2501-RM4850, each representing 42.8%. Clearly, RMEs did offer the better opportunity for local entrepreneurs to substantially elevated the monthly income status of the respondents.

Table 5. Respondents' monthly income (before and after) (n=7)

Category of income	Before venturing into RMEs		After venturing into RMEs	
	Frequency	Percentage	Frequency	Percentage
<RM750	2	28.6	0	0.0
RM751-RM1000	3	42.8	0	0.0
RM1001-RM2500	2	28.6	3	42.8
RM2501-RM4850	0	0.0	3	42.8
RM4851-RM11000	0	0.0	1	14.3

Source: Research Fieldwork [15].

Usage of ICT among Respondents

Based on the survey, all respondents within the study area currently own a smartphone, and 50% of them have a WIFI hub at their business premises. Only 20% of respondents possess a tablet, while none own a laptop, printer, or scanner. Many respondents mentioned that utilizing electronic gadgets and engaging in online transactions is a relatively new concept for them. However, they find it sufficient for conducting online business and transactions using their smartphones at the moment. Regarding internet usage, the majority of respondents

(57.1%) reported spending 1-2 hours per day surfing the internet, with 28.6% doing so only a few days per week. The remaining 14.3% mentioned using the internet only a few times per month (Table 6). This finding indicates that all respondents use the internet, allocating time for both business and personal purposes. In terms of frequency, the time spent on internet surfing among respondents appears to be relatively moderate to low, as detailed in Table 6.

Table 6. Time spends on surfing the internet (n=7)

Time spends on surfing internet/web	Frequency	Percentage
1. Rarely use (only few times/month)	1	14.3
2. Only sometimes (few times/week)	2	28.6
3. Normal but not frequent (1-2 hours/day)	4	57.1
4. Frequent (2-3 hours/day)	0	0.0
5. High usage (>3 hours/day)	0	0.0
Total	7	100.0

Source: Research Fieldwork [15].

Table 7 highlights the factors which influencing the usage of ICT among respondents.

Table 7. Factors influencing the Usage of ICT among rural entrepreneurs (n=7)

List of factors	Likert Scale					Mean Score	Ranking
	1	2	3	4	5		
Make works much easier	0	0	3	3	1	3.7	4
Time saving	0	0	1	5	1	4.0	2
Cost saving	0	0	2	4	1	3.8	3
User friendly and easy to be used	0	2	5	0	0	2.7	8
Quick to adapt to ICT usage	0	2	4	1	0	2.8	7
High confident to use ICT for business transaction	0	1	4	2	0	3.1	6
Enhance the reputation and credibility of business	0	0	4	3	0	4.0	2
Easy and faster to promote product	0	1	1	5	0	3.5	5
Pressure of change to progress	0	1	2	3	1	3.5	5
More flexibility (business can be done anywhere)	0	0	1	2	4	4.4	1

Note: Mean score value of 0.0-1.0 denoted very low influence; 1.1-2.0 denoted low influence; 2.1-3.0 (moderate); 3.1-4.0 (high); and 4.1-5.0 (highly influential)

Source: Research Fieldwork [15].

From the list of answers, the top three for the most influential factors are "ICT offers more flexibility for them whereby business can be done anywhere and remotely" (mean score value of 4.4), followed by "time saving" (4.0) and "ability of ICT to enhance the reputation and credibility of business" (4.0). while for the least influential factors mentioned by

respondents are "high confident of using ICT for business transaction" with mean score value of 3.1, followed by "quick to adapt to ICT usage" (2.8) and "user friendly and easy to be used" (2.7).

Based on the results from Table 7, it seems that respondents among rural SME operators in the study area are embracing ICT because

they are looking for flexibility to conduct business especially in managing booking of their potteries by customers, and also influence by the time and cost savings when they are using ICTs, as compared to the previous conventional approach with minimal ICT usage.

Physical and Non-Physical Needs for ICT Adoption

The study also solicits inputs and opinions of respondents regarding the suggestions on how to improve and enhance the ICT adoption related to RMEs pottery-production business. As a result, respondents highlighted the following suggestions:

(1) Suggestions for physical improvements:

- Giving special voucher to purchase IT devices;
- Identify location and built new communication towers in rural areas
- Introduce free WIFI hotspots;
- Leverage on existing Rural Transformation Centre (RTC) as a training hub for rural entrepreneurs to enrol into ICT training and upscaling classes;
- Diversified the function of Medan Info Desa (rural internet centre) as a strategic meeting point for local entrepreneurs with government agencies and potential clients.

(2) Suggestions for non-physical improvements:

- Updating the training module to enhance ICT literacy, for using including training courses for building website, selling at international e-commerce platforms and mentor-mentee program;
- Strengthening the credibility of existing e-commerce platform (desamall.my) to encourage online selling and business transactions;
- Micro financial scheme without interest for RMEs;
- Provide platforms for business networking and collaborations at national and international levels.

Based on the feedback from respondents, there should be a growing need for ministries including the Ministry of Rural Development, Ministry of Entrepreneurs and Cooperative and Malaysian Communication and Multimedia Commission (MCMC) to initiate

the disbursement of special voucher for RMEs to purchase ICT devices to be used for business purposes. Respondents also mentioned about the needs to upgrade the internet coverage in rural areas by increasing the location and building of new communication towers as well as the provision of free WIFI hotspots. The remaining two suggestions are more related to enhance the function of existing infrastructure/buildings namely the Rural Transformation Centre (RTC) at district level and Rural Internet Centre at village level to cater for ICT-related training for RMEs.

As for the non-physical improvement, among suggestions given by the respondents are related to the needs to upgrade the training module for ICT literacy since IT sector experienced rapid changes with the emergence of new tools and platforms to conduct online-related business. To address this challenge, the training modules need to be up to date and relevant with the current and future conditions. Furthermore, there is a need to enhance the credibility of existing e-commerce platform especially the home-grown apps known as “Desamall.my” as an online shopping mall created for marketing and selling of various rural entrepreneurs’ products. Other suggestions are including provision of micro credit loan without interest and establishment of forum or platform that could allow networking and collaboration between local entrepreneurs and international partners to boost their awareness, knowledge and skill through mentor-mentee and sharing of knowledge.

CONCLUSIONS

In summary, this study reveals that rural micro-enterprises (RMEs) engaged in pottery-making in the Kuala Kangsar district exhibit characteristics consistent with those discussed in the literature review. These characteristics include a small-scale organizational system, proximity to raw materials, local ownership, employment of local individuals, and the integration of ICT into business activities. Table 5 illustrates a noteworthy trend, indicating that all respondents experienced an

increase in monthly income upon entering RMEs, transitioning from a low-income status to middle and high-income. This data underscores the positive impact of RME activities on monthly income. Regarding ICT usage, a majority of respondents in the study area possess smartphones and have installed WIFI hubs at their business premises. They employ smartphones for online business transactions, with internet usage averaging a moderate 1-2 hours per day, not exceeding 2-3 hours daily.

Respondents emphasized that the primary factors influencing ICT usage are its inherent flexibility, enabling businesses to operate anywhere and remotely, coupled with the time and cost savings it offers compared to conventional approaches. Several suggestions were provided to enhance ICT adoption among respondents and other rural micro-enterprises (RMEs) in the study area. These include capitalizing on existing rural infrastructure such as Rural Transformation Centres (RTCs) and Rural Internet Centres, reinforcing their roles as training hubs for RMEs. Other proposed measures involve tailoring training programs to address current needs, implementing micro-credit schemes, and establishing platforms for knowledge and experience sharing among RMEs. In conclusion, the adoption of ICT has transformed the way rural entrepreneurs conduct their businesses, transitioning from traditional to more flexible approaches. However, ongoing efforts are crucial to raise awareness and enhance ICT skills among RMEs, ensuring their sustained viability in the future.

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