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Article

The Impact of ICT in Empowering Sarawak Women in Home-Based Business Communities

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Abstract: In alignment with the sustainability strategy focusing on good governance, sustainable development, and racial harmony, this study investigates the access, use, and effects of ICT training on women in Sarawak. Its primary objective is to assess how ICT training benefits women in managing small home-based businesses. Data was gathered through questionnaires from 62 participants who attended training sessions in various Sarawak locations: Kota Samarahan, Sri Aman, Sarikei, Kuching, and Bako. This research holds significant importance for the state government, as it strives to increase the number of individuals with ICT skills and narrow the digital divide between urban and rural areas. The study reveals a strong consensus among respondents regarding the positive impact of ICT on empowering women, boosting their self-esteem, enriching their knowledge and skills, benefiting the socio-economic community, and fostering efficient management practices. The findings offer valuable insights into the effectiveness of ICT training for Sarawakian women engaged in home-based businesses. The mean scores for all variables indicate high agreement among respondents, with values exceeding four for each variable. This study underscores the substantial role of ICT in knowledge dissemination and empowering individuals, particularly in advancing gender equality. It suggests that ICT is an invaluable tool for successful training in rural areas and underscores the need for a systematic strategy to enhance ICT literacy.

Keywords: Women; home-based business; ICT; digital gap; gender equality

Introduction

The gap between those who have access to Information & Communication Technology, ICT and those who are technologically disadvantaged, particularly women, is expected to deepen, contributing to an increase in global inequality. This gap arises from inadequate infrastructure and limited technology access. There is an increase in the use of ICT among women, however women entrepreneurs are lacking knowledge or competence to use them effectively (Sicat et al., 2020). For the majority of women in Sarawak, their level of knowledge and skill mastery, particularly in ICT, is a decisive factor. Therefore, it is important to place greater emphasis on ICT training programs to provide women who have been left behind with opportunities to gain experience and compete, particularly in the business sector, to improve their chances of success. Furthermore, both government and non-governmental organizations have recognized the significance of this issue and have implemented programs to address it. According to Jainol (2020), the Sarawak Government established Sarawak Information System Sdn Bhd (SAINS) as a pioneer in ICT in Sarawak, providing ICT assistance not only to government servants but also organizing ICT programs for both rural and urban populations.

Consequently, ICT knowledge and access to internet connectivity can play a vital role in ensuring the sustainability of rural development by maximizing productivity (Kamarudin et al., 2019). This can be achieved by facilitating access to valuable information, particularly for small businesses, as its presence promotes the sharing of solutions among local residents and communities.

Literature Review

1. ICT and Women Empowerment

In the context of university and community outreach, service learning serves as a method for the university to actively engage in structured activities that address community needs. Empowerment can be defined as the development of women who are politically active, economically productive, and capable of making their own decisions (Yusoff et al., 2022). Scholars have identified the use of information communication technology (ICT) as a tool to facilitate women's empowerment (Ajjan et al., 2014).

The utilization of ICT is crucial to improve the quality of civic engagement and bridge the digital gaps within the local community itself (Semenski et al., 2017). However, a noticeable gender digital divide persists, leading to lower access and usage of technology by women compared to men, due to socioeconomic, structural, behavioral, and institutional constraints (Singh & Kumar, 2018).

Women still face fewer opportunities than men to leverage ICTs for enhancing their lives. Only a limited number of individuals can benefit from participating in the economy, establishing social networks, and accessing better services from both the public and private sectors, as many aspects of daily life and basic services are delivered through digital technologies (Mariscal et all., 2019). Furthermore, studies highlight the value of ICTs in providing flexible working hours and supporting women entrepreneurs through networking, lower startup costs, and flexible work schedules (Kamberidou, 2020).

2. Women and Home-based Business

A strategy to empower women, especially in rural areas, is to promote home-based business activities among women entrepreneurs, considering that many women work as housewives. Home-based businesses offer more benefits to women compared to traditional business activities. There are notable differences between two groups of women business owners—home-based and those with regular businesses—in terms of work/family conflict and economic success, despite sharing similarities in ethnicity, personal history, motivation, experience, and family status (Karyn & Andrea, 2014).

Research and experience indicate that women's business success often begins from home (Constantinidis et al., 2019). Many female entrepreneurs find motivation and start their business ventures from home, gradually growing them to remarkable levels. It is worth noting that many women who operate home-based businesses may not require significant funding to launch the enterprises they desire (Oladipo et al., 2023). Home-based businesses can serve as a "trial run" before expanding beyond the confines of the home into a larger business space (Vermani & Sharma, 2021). Studies reveal that, compared to their counterparts, women who run home-based businesses report fewer conflicts related to work and family commitments.

3. Bridging the Digital Divide For Rural Home-Based Industry

ICT knowledge and assistance for internet connectivity can help ensure the sustainability of rural development by maximizing rural production and facilitating access to useful information, particularly for small businesses (Kamarudin et al., 2019). The 'digital divide' is characterized as the gap between individuals, households, businesses, and geographic areas at different socioeconomic levels in terms of their opportunities to access information and communication technologies (ICTs) and their use of the internet for various activities (Vassilakopoulou & Hustad, 2023). ICT also serves as a means of bridging the digital gap that separates rural communities from their urban counterparts, thereby enhancing the quality of life for rural communities and accelerating their growth.

Information and Communication Technology (ICT) education would be a catalyst to bridge the digital divide. (Sulaiman & Halamy, 2021). The interplay of business characteristics, personal experiences, and off-

site employment/education experiences shapes the use of home and business internet, influencing perceived digital needs and expectations (Philip & Williams, 2019).

4. Gender Equality in Home-based business

The way activities are carried out by men and women, particularly in business, is influenced by gender-based human nature. Gender equality refers to the equal conditions for women and men to realize their full human rights, contribute to national, political, economic, social, and cultural development, and benefit from the outcomes (Ibnouf, 2019).

Gender equality is not only a fundamental right but also a necessary foundation for a peaceful, prosperous, and sustainable world (Shanthi & Sai Mitravinda, 2020). Decades ago, gender inequality was prevalent, with women facing limitations in various aspects of life and having access restricted to certain areas. For instance, Globally, 750 million women and girls are married before the age of 18. In 18 countries, husbands have legal authority to prevent their wives from working. (Un Women, 2018). This phenomenon restricts women's opportunities to engage in more challenging economic fields. Today, women are no longer solely viewed as full-time housewives; many of them are able to pursue careers in the business field. This shift is driven by the rising cost of living and the increasing demands of a more demanding lifestyle. The rapid economic growth, particularly in developing countries like Malaysia and Sarawak, has opened up business opportunities for both men and women. Furthermore, the availability of foreign workers through employment agencies has facilitated the recruitment of domestic helpers who can assist with household chores. Consequently, it is not surprising that the concept of gender equality is gaining prominence within the community, especially in various locations in Sarawak.

Methodology

In conducting a study aimed at understanding the impact of ICT training on the empowerment of rural women in Sarawak, a well-structured research design was employed. The design encompassed several vital components.

1. Sampling

In this study, we choose a convenience sampling method. The participants involved women who participated in ICT workshops organized by UiTM Sarawak in different locations, including Kota Samarahan, Sri Aman, Sarikei, Kuching, and Bako. The rationale of the convenience sampling is chosen due to the accessibility and availability of participants through the ICT workshops. All 62 respondents volunteered to complete the online questionnaire.

2. Data collection

Method of data collection was an online questionnaire. This is because online questionnaires offer ease of data organization, rapid information retrieval, and convenience for both researchers and respondents. This method aligns with the aim of reaching participants efficiently, considering their prior engagement in ICT workshops.

3. Questionnaire Design

The questionnaire utilized in this study was an adapted online version, drawing from the work of Rashid et al. (2022) with tailored modifications to suit the specific research context. It was structured into distinct sections to effectively capture the essential information. Parts A and B were dedicated to gathering demographic data from the respondents, enabling a comprehensive understanding of their background. On the other hand, Parts C to G focused on probing the participants about their experiences and perceptions related to ICT training and empowerment. To gauge responses effectively, a Likert Scale with five response options ranging from "1 - strongly disagree" to "5 - strongly agree" was employed. The questionnaire encompassed a total of five variables, denoted as C, D, E, F, and G, each comprising varying numbers of items (10, 4, 2, 3, and 4 items, respectively) to comprehensively assess the targeted aspects of ICT training and empowerment.

4. Data Analysis

The analysis included reliability testing using Cronbach's Alpha coefficient to ensure the questionnaire's internal consistency. Additionally, mean scores were computed to evaluate the effectiveness of ICT training in empowering rural women in home-based businesses. Furthermore, a demographic analysis was conducted to comprehensively understand the characteristics and profiles of the respondents, shedding light on how various demographic factors might influence their perceptions and experiences.

Findings

In this part we will discuss the findings of our study. The calculation and the results have been run using SPSS. We will discuss the results on the demographic profile, the analysis of the questionnaire, and the impact of ICT technology training on women in Sarawak.

1. The Demographic Profile

The results on demographic profile have been summarized in Table 1. Based on the results presented in Table 1, we can observe that most of the respondents fall within the age range of 36 to 45 years old, accounting for 37.1% of the total number of respondents. Conversely, the lowest number of respondents is observed among those above 56 years old with 3.2%.

Table 1. Demographic profile

Profile	Frequency	Percentage (%)
Education Level		
University	12	19.4
Skill Centre	17	27.4
Secondary school	28	45.2
Primary School	4	6.4
No Education	1	1.6
Age		
< 25	7	11.3
26-35	16	25.8
36-45	23	37.1
46-55	14	22.6
56>	2	3.2
Race		
Bidayuh	4	6.5
Iban	11	17.7
Malay	41	66.1
Others	6	9.7
Total	**62**	**100.0**

Furthermore, we can see that most of the respondents, accounting for 45.2%, have completed their education up to secondary school level. The next highest percentage, 27.4%, indicates that respondents have attended training at a skill centre. Additionally, 19.4% of the respondents are university graduates. These results provide valuable insights into the demographic and educational background of the respondents. The high percentage of respondents who have completed their education up to secondary school level suggests that there may be a need for further education and training programs to enhance their skills and knowledge. On the other hand, the relatively low percentage of respondents who are university graduates may indicate a need for more opportunities for higher education in the region. The distribution of respondents' races was also presented. The majority of participants, comprising 66.1%, identify as Malay, followed by 17.7% who identify as Iban. Bidayuh respondents account for only 6.5% of the total, while the remaining 9.7% represent other ethnic groups. It is important to note that Sarawak is home to 27 ethnic groups, as cited in the Malaysia Information (n.d).

Out of the 62 respondents, the highest percentage, accounting for 58%, are involved in the food business. This can be attributed to the fact that the food business requires relatively small capital, and many

women possess basic cooking skills. Women were taught traditional food cooking skills by their mothers during childhood. In adulthood, women's employers taught them the cooking skills needed to prepare "Urban Food." Additionally, women were also taught by their husbands to cook food that suited their tastes and eating patterns (Silva et al., 2022). Furthermore, the accessibility of online resources allows them to learn and explore new recipes and cooking techniques. The second-highest percentage, 12.9%, represents respondents involved in the health and beauty product business. Other types of businesses, such as those categorized as "Others," clothing, craft, and service businesses, account for 11.29%, 9.68%, 6.45%, and the remaining percentage, respectively. The presence of other types of businesses indicates a diverse entrepreneurial landscape among Sarawak rural women.

Table 2. Business profile

Profile	Frequency	Percentage (%)
Type of Business		
Craft	4	6.45
Food	36	58.07
Clothing	6	9.68
Service Business	1	1.61
Health and Beauty Product	8	12.9
Duration of Business (Years)		
<1	12	19.35
1 – 3	19	30.65
4 – 6	12	19.35
7 – 9	10	16.13
>10	9	14.52
Respondents' Monthly income (RM)		
<1000	21	33.87
1001 – 2000	8	12.90
2001 – 3000	19	30.65
3001 – 4000	11	17.74
4001 – 5000	93	4.84

Approximately 30.65% have been involved in business for 1 to 3 years from all 62 respondents engaged in business. This is followed by 19.35% of respondents who have run their businesses for less than one year. Additionally, 16.13% of respondents have been in business for 4 to 6 years, 14.53% for 7 to 9 years, and 14.53% for more than 10 years. These results provide insights into the duration of business among the respondents. The high percentage of respondents who have been involved in business for 1 to 3 years suggests that there may be a need for more support and resources to help new businesses succeed. On the other hand, the relatively low percentage of respondents who have been in business for more than 10 years may indicate a need for more long-term support and resources to help businesses sustain their operations.

Table 2 also displays the respondents' monthly income among all respondents. Out of the 62 respondents, the highest percentage (33.87%) have a monthly income below RM1000. This is followed by 30.65% of respondents who earn a monthly income between RM2001 and RM3000. Additionally, only 4.84% of respondents have a monthly income ranging from RM4001 to RM5000. These results provide insights into the monthly income distribution among the respondents. The high percentage of respondents who earn a monthly income below RM1000 suggests that there may be a need for more support and resources to help improve their financial situation. On the other hand, the relatively low percentage of respondents who earn a monthly income ranging from RM4001 to RM5000 may indicate a need for more opportunities for higher-paying jobs in Sarawak.

2. The Reliability Analysis of The Questionnaire and Level Determination Based on Mean Score

All statements were rated using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) for each variable in Table 3. The reliability of each variable was assessed using Cronbach's Alpha coefficient. According to the guidelines provided by George and Mallery (2003) as cited in Schrepp (2020), the following interpretations can be made: >0.8 (Excellent), 0.7-0.8 (Good), 0.6-0.7 (Acceptable), 0.5-0.6 (Questionable), 0.4-0.5 (Poor), and <0.4 (Unacceptable).

From the results presented in Table 3, the Cronbach's Alpha coefficient for the variable "Effectiveness of ICT training for women in home-based business: improved appearance and confidence level" is excellent. The variable "Empowering Sarawak Women Through ICT" has a good Cronbach's Alpha value. Similarly, the variables "Improving the Socio-Economic Community In ICT" and "Systematic Management" also demonstrate good reliability. These results indicate that the variables have good internal consistency and reliability, except for the variable "Improvement of Knowledge and Skills," which has a slightly lower but still acceptable reliability.

Table 3. Reliability analysis of the questionnaire

Variables	**Number of items**	***Cronbach's Alpha,***
A: Empowering Sarawak Women Through ICT	10	0.881
B: Effectiveness of ICT Training for Women in Home-Based Business Improved Appearance and Confidence Level	4	0.943
C: Improvement of Knowledge and Skills	2	0.760
D: Improving the Socio-Economic Community In ICT	3	0.896
E: Systematic Management	4	0.800

The Likert scale used in this questionnaire has been condensed into three levels for easier analysis of Parts A to E. The mean values obtained from the responses were categorized into three levels: low, moderate, and high. This method of interpretation, based on the formula (5-1), has been previously utilized in studies such as those conducted by Kosnin and Lee (2008), Ahmad Bakri et al. (2018), Salleh et al. (2018), and Ahmad et al. (2021). The mean score for each variable were calculated and presented in Table 4.

Table 4. Level determination based on mean score

Mean score	**Level**
1.00 – 2.33	Low
2.34 – 3.67	Moderate
3.68 – 5.00	High

3. Examining the Impact of ICT Technology Training on Women in Sarawak: Insights From Mean Scores and Variable Evaluations

The impact of ICT technology training on women in Sarawak will be discussed in this part. There are five variables that will be evaluated as presented in Table 5. The mean scores are classified according to all respondents to examine any differences in their opinions. The value of mean score in Table 5 is determined as high by referring to Table 4 which explains good results. For variable A, the mean score is high, indicating that the respondents agree that ICT can empower Sarawak women. Similarly, for variable B, the high mean score suggests that the respondents agree that ICT training for women in home-based business improves appearance and confidence levels.

The respondents also agree that ICT training can enhance knowledge and skills (variable C), improve the socio-economic community (variable D), and contribute to systematic management (variable E). These results provide valuable insights into the respondents' opinions regarding the effectiveness of ICT training in empowering Sarawak women in home-based businesses. The high mean scores for variables A and B indicate a strong agreement among the respondents regarding the positive impact of ICT on empowering women and

improving appearance and confidence levels. Additionally, the agreement on variables C, D, and E suggests that ICT training can also enhance knowledge and skills, improve the socio-economic community, and contribute to systematic management.

Table 5. Mean score for each variable

Variables	Mean score value	Mean score level
A: Empowering Sarawak Women Through ICT	4.1887	High
B: Effectiveness of ICT Training for Women in Home-Based Business Improved Appearance and Confidence Level	4.4315	High
C: Improvement of Knowledge and Skills	4.3710	High
D: Improving the Socio-Economic Community In ICT	4.2849	High
E: Systematic Management	4.4032	High

Discussion

The results of the demographic profile, educational background, business involvement, business duration, and monthly income among the respondents shed light on important aspects of the surveyed population in Sarawak. Most respondents were in the age range of 36 to 45 years old, indicating a significant proportion of middle-aged women participating in the study. This age group's prominence could signify a stage in life where women are actively engaged in entrepreneurial pursuits or seeking avenues to enhance their skills and knowledge. In terms of educational attainment, a substantial percentage of respondents had completed their education up to the secondary school level. This highlights an area for potential educational interventions to further equip them with skills relevant to their businesses.

The distribution of respondents across various business types reflects the entrepreneurial landscape in Sarawak, with a significant portion involved in the food business, possibly due to its relatively low capital requirements and the prevalence of cooking skills passed down through generations. This underscores the importance of traditional skills in business ventures and the potential for leveraging online resources to explore and expand their businesses. Regarding the duration of businesses, a notable percentage of respondents had been involved in their respective businesses for 1 to 3 years, indicating a recent entry into entrepreneurship. This suggests a need for targeted support and resources to ensure the sustainability and growth of these newer ventures. Conversely, the relatively low percentage of respondents engaged in business for more than 10 years suggests a requirement for long-term support mechanisms to sustain businesses over extended periods.

Analyzing the monthly income distribution provides insights into the economic standing of the respondents. A substantial proportion earned a monthly income below RM1000, underscoring the financial challenges faced by a significant portion of the respondents. This emphasizes the necessity for comprehensive support systems, training, and opportunities to enhance their financial stability and overall well-being. These demographic and socioeconomic results offer valuable insights for policymakers, organizations, and stakeholders to tailor interventions, educational programs, and business support initiatives that address the specific needs and circumstances of women entrepreneurs in Sarawak, fostering their empowerment and economic growth.

Particularly, the variable related to the empowerment and appearance enhancement through ICT training demonstrated an excellent level of internal consistency. However, the variable assessing the improvement of knowledge and skills displayed a slightly lower but still acceptable level of reliability. To facilitate analysis, the Likert scale responses were condensed into three levels: low, moderate, and high, using a specific formula. This approach, validated by previous studies, aids in efficient categorization and interpretation of mean scores, as presented in Table 4. These findings collectively serve as a robust basis for comprehending the perceived effectiveness of ICT training for women in home-based businesses, providing valuable insights for future interventions and strategies aimed at enhancing empowerment and socio-economic growth in Sarawak.

The study delves into assessing the impact of ICT technology training on women in Sarawak by evaluating five key variables. The mean scores derived from Table 5 offer valuable insights into the opinions

of the respondents and help identify any disparities in their views. Referring to the benchmark set by Table 4, which defines a high mean score as indicative of good results, we can interpret the outcomes. For variable A, the high mean score suggests a strong consensus among respondents regarding the empowering potential of ICT for Sarawak women. Similarly, the high mean score for variable B indicates agreement among respondents that ICT training positively influences appearance and confidence levels in home-based businesses. Moreover, respondents concur on the positive impact of ICT training in enhancing knowledge and skills (variable C), improving the socio-economic community (variable D), and promoting systematic management (variable E).

These findings underscore the widespread belief among respondents in the efficacy of ICT training to empower women in home-based businesses, reflecting positively on various aspects such as appearance, skills, and community development. The high mean scores for variables A and B particularly emphasize the strong agreement on ICT's affirmative influence on empowering women and boosting their confidence. Additionally, the shared viewpoint on variables C, D, and E further highlights ICT training's potential to enhance knowledge, uplift the socio-economic landscape, and foster systematic management. These results collectively reinforce the importance and effectiveness of ICT training in promoting empowerment and fostering a conducive environment for women engaged in home-based businesses in Sarawak.

Conclusion

ICT is integral to modern business operations, impacting everything from communication and efficiency to innovation and customer service. Embracing and effectively implementing ICT solutions can help businesses stay competitive, adapt to changing market conditions, and achieve long-term success in the digital age. According to the results presented, the mean scores for variables such as “Empowering Sarawak Women Through ICT”, “Effectiveness of ICT Training for Women in Home-Based Business Improving Appearance and Confidence Level”, “Improvement of Knowledge and Skills”, “Improving the Socio-Economic Community in ICT”, and “Systematic Management” are high. This indicates that the respondents had high expectations for these variables and agreed with their significant effectiveness in empowering Sarawak women in enhancing their skills and knowledge to operate small home-based businesses. These results provide valuable insights into the importance of ICT training in rural areas and the need for a systematic approach to enhance ICT literacy. The recommendations provided can help policymakers and stakeholders develop effective strategies to improve IT literacy in rural areas. The structure of this impact of ICT on business should be investigated in further detail as a reference for future studies, as it is divided into several areas to consider. This will aid in the development of a more robust response to the ICT values that contribute to long-term business intelligence. Hence, it is recommended to continue conducting ICT training for women in rural areas of Sarawak. These findings indicate that such training programs have a positive impact on empowering women, improving appearance and confidence levels, enhancing knowledge and skills, improving the socio-economic community, and contributing to systematic management.

Likewise, it is recommended that a systematic and practical plan specifically designed for rural areas be developed to enhance ICT literacy. ICT training offers several advantages, including raising socioeconomic status, improving literacy levels, bridging the digital divide, and enhancing knowledge. To ensure accessibility and availability of ICT services in rural communities, it is crucial to maintain centralized centers such as “Pusat Internet Desa” equipped with conducive facilities that can serve as venues for conducting training workshops. Rural areas can continue to benefit from utilizing telecentre facilities and the IT services they provide. This approach will contribute to increasing IT literacy in rural areas and ultimately improve income generation.

It is important to acknowledge that the results of this study are limited to rural women in Sarawak who have attended ICT training conducted by UiTM Sarawak. Further research may be required to validate these findings and explore the potential benefits of ICT training for women in other regions or contexts.

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