DIGITAL INCLUSION INTERVENTION FOR WOMEN MICROENTREPRENEURS IN EAST COAST PENINSULAR MALAYSIA: INTEGRATING DIGITAL LITERACY, SOCIAL SUPPORT, AND ENTREPRENEURIAL CAPABILITIES NGT APPROACH TO SELECTING THE MOST PRACTICAL AND IMPACTFUL INTERVENTIONS

Nur Shaliza Sapiai[1*]
Asma' Rashidah Idris[2*]
Ramlan Mustapha[3]
Norazmila binti Yusuf[4]
Yuslina binti Yusoff[5]
Firdaus Abdul Rahman[6]
Rogayah binti Mohd Zain[7]

[1] Faculty of Information Science UiTM Cawangan Kelantan, Malaysia
(E-mail: nurshaliza@uitm.edu.my)
[2] Faculty of Business Management, UiTM Cawangan Negeri Sembilan
(E-mail: asmar440@uitm.edu.my)
[3] Academy Contemporary Islamic Studies , UiTM Pahang Kampus Raub
(E-mail: ramlan @uitm.edu.my)
[4] Akademi Pengajian Islam Kontemporari, UiTM Kampus Machang, Cawangan Kelantan.
(E-mail: norazmila@uitm.edu.my)
[5] Fakulti of Business Management , UiTM Cawangan Kelantan Kampus Machang
(E-mail: yuslinayusoff@uitm.edu.my)
[6] Faculty of Information Science,University Teknologi MARA, Cawangan Kedah
(E-mail: firdaus396@uitm.edu.my
[7] Akademi Pengajian Islam Kontemporari, UiTM Kampus Kota Bharu, Cawangan Kelantan.
(E-mail: 2024861492@student.uitm.edu.my)
*Corresponding author: asmar440@uitm.edu.my

To cite this document:
Sapiai, N. S., Idris, A. R., Mustapha, R., Yusuf, N., Yusoff, Y., Abdul Rahman, F., & Mohd Zain, R. (2026). Digital inclusion intervention for women microentrepreneurs in East Coast Peninsular Malaysia: Integrating digital literacy, social support, and entrepreneurial capabilities NGT approach to selecting the most practical and impactful interventions. *Journal of Islamic, Social, Economics and Development (JISED),* 11 (80), 131 – 146.

Abstract: *This study constructs a combined digital inclusion intervention model for women micro-entrepreneurs in East Coast Peninsular Malaysia, based on the intersection between digital literacy, social support system and entrepreneurial capability enhancing. Women micro-entrepreneurs in Kelantan, Teren-gganu and Pahang encounter complex barriers such as inadequate digital infrastructure, low technological literacy, poor business networks and*

sociocultural norms that impede them to engage in the digital economy. Using the Nominal Group Technique (NGT) approach, seven experts purposively selected from government officials, training providers, digital literacy entrepreneurs women who have succeeded in enterprise and financial institutions participated in a virtual consensus-building session held on Google Meet. Experts identified and prioritised six key interventions through five formal rounds of silent generation (ideas), round-robin (sharing ideas), group discussion (reasoning) and total priority voting. The findings showed that it was univer sally agreed upon (across all ratings) that "Easy Financial Records & Cashflow Workshop using apps" was the number one priority (100% consensus), followed by "Content and Live Selling Training (By Phase)" (95.24% consen sus) and finally, "Digital Security & Anti Scam Training" garnered a 90.48% consensus. Our results show preference on the part of experts for agents that connect digital tools to business objectives with significant focus on financial management and revenue generation as opposed to early-stage technical training. This approach is an evidence-based guide for the policy makers and program designers to adopt a business value first standpoint in terms of how best to tailor initiatives on digital inclusion for rural women entrepreneurs in developing economies.

Keywords*: Digital Inclusion, Women Micro-entrepreneurs, East Coast Malaysia, Nominal Group Technique, Digital Literacy, Entrepreneurial Capability*

Introduction

Women microentrepreneurs along the East Coast of Peninsular Malaysia covering Kelantan, Terengganu and Pahang women are known to be an important group within the local economic eco-system but they also function in a hostile structural and sociocultural environment. The area is highly populated with community microentrepreneur women, which mainly dominating in the traditional food production such as keropok lekor, handicraft, agro-based businesses (Mokhtar et al., 2023). According to recent figures 21 percent per cent of Malaysia's SMEs are women owned businesses with approximately 241,767 women-led businesses in operation (ibid); although the proportion of these in rural areas is lower in part due to lack of access to infrastructure and capital (Strive Malaysia, 2025). There is a complex set of constraints that women entrepreneurs in the region experience—ranging from traditional gender roles, which restrict mobility and time opportunities to access formal financing, business networks, and entrepreneurial education (Carter & Shaw, 2022). Researches revealed that women entrepreneurs particularly in Terengganu have a problem to get access of direct loans by formal financial institutions due to the lack of collateral and experiences (Mokhtar et al., 2023); thus most of the are under go for personal savings and informal loan from family members.
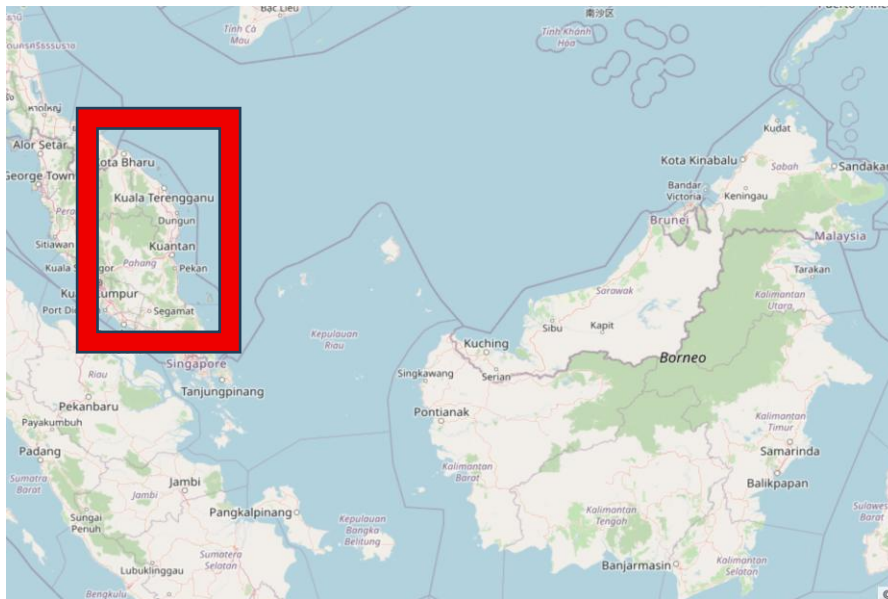
Figure 1: Geographical Location of Study Area (East Coast Peninsular Malaysia)
Source : https://www.openstreetmap.org/#map=6/3.72/112.41

Digital inclusion is a game changer for inclusive economic development, enabling entrepreneurs to take advantage of the burgeoning digital economy. Digital technologies are able to provide access to wider markets, reduce transaction costs, ease the availability of market and financial information and facilitate participation in global value chains (Elia et al., 2020). In Malaysia, the significance of equitable digital access has been highlighted by MyDIGITAL (MCMC, 2021) and subsequently addressed in several associated policy documents such as the Malaysia Digital Economy Blueprint through their emphasise on widening access to ICT opportunities for the marginalized rural women (MDEC, 2021). It was found that digital leadership positively impacts on entrepreneurial success for countryside women-entrepreneurs, and entrepreneurial resilience serves as the major mediator in the conversion of digital strategies into business outcomes (Zhao & Collier, 2016). Based on a recent study in Pahang, digital leadership influences rural women's entrepreneurial resilience, which contributes to sustainable entrepreneurship success (Ahmad et al., 2025). But these transformative effects will only materialize if people are able to access and use digital technology effectively, an ability which is unevenly distributed among women microentrepreneurs on the East Coast of Malaysia.

The continuing digital divide risks deepening existing inequalities. Digital literacy Women in Malaysia, especially those residing in rural areas, have lower digital literacy levels compared to men and only 20.6% of SMEs are owned by women (Lim, 2025). It has been observed that women micro-entrepreneurs in Malaysia face three main challenges: the weak link between digital literacy and entrepreneurial activities, low-confidence levels regarding financial skills with only 50% confident in financial literacy only covering tracking basic expense items, and the unfamiliarity with broader financial concepts like changing markets or raising finance (Strive Malaysia, 2025). Infrastructure constraints worsen up the condition— rural areas on East Coast face unstable internet connectivity, absence of constant power supply and expensive price of digital devices in compared to household income however (Kamarudin et al., 2019). Sociocultural norms are also implicated in such a pattern, as traditional gender roles have implications for women's access to technology training, professional networks and time to

learn digital skills (Basit et al., 2020). These barriers have led female micro-entrepreneurs to miss out on opportunities for e-commerce platforms, digital financial-services and online marketing conduits that can significantly enhance their business.

Table 1: Multidimensional Digital Divide Indicators Affecting Women Micro Entrepreneurs in east Coast Malaysia

| Dimension	Specific Barrier	Impact on Women Entrepreneurs	Evidence Source
Infrastructure	Unstable internet connectivity in rural areas	Inability to maintain consistent online presence or use cloud-based services	Kamarudin et al. (2019)
	Unreliable electricity supply	Disruption to digital device usage and charging	Keling et al. (2025)
Literacy	Low digital marketing skills	Limited ability to promote products through social media	Moorthy & Sahid (2021)
	Inadequate financial digital literacy	Only 50% confident in financial knowledge; limited to basic expense tracking	Strive Malaysia (2025)
Access	High cost of digital devices	Smartphone costs represent 40-50% of monthly household income	Ahmad et al. (2024)
	Limited access to formal digital training	Fewer training programs in rural East Coast vs. urban centers	Basit et al. (2020)
Sociocultural	Traditional gender role expectations	Limited time and mobility for technology learning	Giménez & Calabrò (2018)
	Male-dominated tech training environments	Reluctance to participate due to cultural norms	Yousafzai et al. (2015)
Support Systems	Weak social and business networks	Isolation from peer learning and mentorship opportunities	Zaato et al. (2023)
	Inadequate government program implementation	Programs often generic, not addressing specific needs	Ahmad et al. (2024)

Source : Author
Note: Table presents list of different hurdles to digital inclusion in the literature of women micro-entrepreneurs located at Malaysia's East Coast. Implications of the findings are accompanied by novel themes in empirical data as evident from impact statements' Interpretation Impact Statements illustrate emerging qualitative findings arising from current empirical research. These inter-related barriers need to be addressed with a multi-dimensional intervention approach that spans infrastructure, capacity development and social support.

This exclusivity in the digital domain is not about access to technology only, but is symptomatic of a larger institutional failing on developing women entrepreneurs. The lack of proper implementation of government program, including National Women Entrepreneurs Financing Program, CIP Cradle Fund Catalyst Program and SME Corp programs has resulted in less focus on the real issue that is being faced by women microentrepreneurs which include low digital literacy, inadequate in terms resource allocation and bureaucratic inefficiency (Ahmad et al., 2024). Gender dimensions and the societal contexts in which women engage in digital entrepreneurship are largely overlooked in current policies and programs. The absence

of customized digital literacy teaching, fragile social support systems and deficient promotion of entrepreneurial capabilities formed a circle of exclusion which perpetuates the economic imbalance (Giménez & Calabrò, 2018). Three women: Three highly digital-diverse digital skills In academic research, it is found that when women go beyond basic digital skills to advanced ones they are more likely than other users of banking services to have formal accounts making business easier (Hasan 2016 Hasan 2023; also see Wihbey and Langholz 2004).

In order to target these challenges, it is necessary to develop a holistic evidence-based intervention model which combines digital literacy, social support and entrepreneurship training in an integrated package. The intervention model presented here employs the Nominal Group Technique (NGT) as a methodology for selecting an intervention package of measures whereby a variety of stakeholders, such as women entrepreneurs themselves, policy makers, training providers and financial institutions can participate in identifying and prioritising interventions that are most viable and have greatest impact..
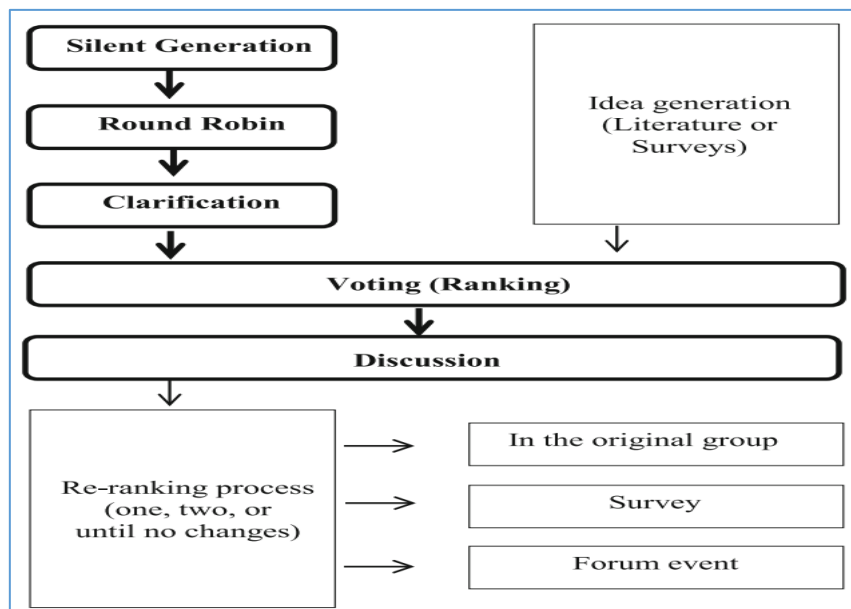
Figure 2: Nominal Group Technique (NGT) Process Flow for Intervention Prioritization

Source: Mc Millan et al., 2016
Note : Flowchart descries the linear five-stage sequence: (1) Explanation and clarification; (2) Silent generation of ideas; (3) Sharing through round-robin; (4) Discussing, and clarifying group understanding; and (5) Voting/ranking. This inclusive, methodical and democratic process guarantees common ownership from all seven experts and delivers consensus on the most practical and highest-impact interventions for digital inclusion

NGT provides a structured, democratic process that ensures that all voices are heard and leads to evidence-based consensus on intervention priorities (Delbecq & Van de Ven, 1971). This approach recognizes that effective digital inclusion requires more than just the provision of technology—it requires a supportive ecosystem that addresses multi-level barriers to digital participation while building individual and collective capacities for sustainable economic growth. By integrating digital literacy components to build basic and advanced skills, social support to create networks of trust and peer learning, and entrepreneurial capacity development to enhance business competencies, this model aims to create a holistic pathway towards digital

inclusivity and economic empowerment for women microentrepreneurs on the East Coast of Malaysia.

Literature Review

However, despite a rapid expansion in the academic literature of digital literacy and digital entrepreneurship over the past decade, there is still an important knowledge gap regarding how to develop and execute digital literacy interventions that are effective for women microentrepreneurs operating within rural areas. A recent study conducted by Moorthy and Sahid (2021) revealed that digital marketing literacy among public university students in Malaysia is of moderate significance to the influencing on entrepreneurial behavior, highlighting that simply knowing how to perform basic digital operations does not translate into cyber business participation. However, Zaleha et al. (2025) are more persuasive and they suggest that digital literacy and entrepreneurial competences account for 37.3% of digital entrepreneurship and by combining the same with government support it accounts for additional 5% impact. These results imply that digital literacy interventions need to be delivered jointly with broader entrepreneurial skills development to prove more effective. Affandi et al. (2024) take the knowledge further by demonstrating that digital usage has a positive impact on business performance of ultra-micro, micro and small enterprises in Indonesia and Malaysia through intermediation-related financial education aspect. One main line of debate that is generated out of this literature can be posed as: whether digital literacy should be taught separately or embedded in the particular entrepreneurial application, which has critical strategy implications for the design and configuration of training programs.

It has often been observed that social support is an integral part of women's entrepreneurial success, but the ways in which social support is connected to digital literacy and technology use are little understood. Zaato et al. (2023) analyze the effect of social capital on female microentrepreneur performance in Malaysia, with internal locus of control and institutional support serving as critical moderators. Giménez and Calabrò, 2018 grouped the types of informal institutional support for women entrepreneurs in to five categories namely gender, social norms; family, religion and codes of conduct. This research claims that family support is an important factor of successful women entrepreneurs and it helps them to balance business life and private life (The Edge Malaysia, 2023). However, opinions vary on the degree to which formal support networks (some of them are business association) or informal networks (family and friends), are more supportive for digital entrepreneurship. Leskinen (2011) submits women entrepreneurs typically lack advanced business and social networks that would help them access information, resources, and markets. Research in Malaysia has found the network to be the most powerful entrepreneurial competency for firm performance and business success compared to other entrepreneurial competencies such as analytical planning, innovation or leadership (Ahmad et al., 2024). Lack of clarity exists around how digital support networks (like social media groups; online forums and virtual learning platforms) can work in addition to (or instead of) traditional forms of individual and peer support, and how different generations' use of technology might influence the efficacy of various available supportive options.

Strengthening women microentrepreneurs' entrepreneurial capacity is more than just offering them generic business skills training; it must be contextual, addressing these structural constraints and social norms on the ground, where they impact women in their local contexts.

A study by Yousafzai et al. (2015) "Gender Equality Legislation & Work-life Balance Policy: the Case of Women in Business Leadership," emphasizes that legislative frameworks on gender equality and work/ life balance policies enable women and promote leadership of women in business. In Malaysia, the implementation of policy is itself lacking in addressing challenges to women microentrepreneurs (Mokhtar, 2020) although the National Women's Policy has been introduced in 1989 and reviewed at year 2009. Hamzah (2012) illustrates that women entrepreneurs are over-represented in micro and informal SME section, where their firms are generally small and home based. Chatterjee et al. (2020) demonstrate for India that technology use and entrepreneurial orientation among rural women is dependent on contextual factors such as sociocultural norms, physical infrastructure, institutional backing etc. There is a central debate within this literature about whether capacity building programs should target 'hard' skills (such as financial management, digital marketing and business planning) or 'soft' skills (indicated by self-confidence, leadership and negotiation training). Sariwulan et al. (2020) confirm that literacy and skills impact on entrepreneurship performance, which leads to the integration discourse. However, the ways in which approaches to capacitation can be adjusted with respect to rural micro-entrepreneurs are still largely unknown for population of this type, whose members experience time stress, mobility limitations and intensive caregiving demands.

Though NGTs have proved to be appropriate for achieving consensus on intervention priorities across a range of stakeholders, they are not widely used in the study of digital inclusivity and entrepreneurship development. NGTs are structured consensus methods that enable respondents to generate ideas in response to questions or problems, and to rank information using a free-voting task (Delbecq & Van de Ven, 1971). Potter et al. (2004)) provided an overview of NGT, which contained stages in the protocol such as introduction and explanation; silent generation of ideas; sharing of ideas; group discussion/clarification; and voting and ranking. An advantage of NGT is that it does not carry with it the issues generated by group dynamics, such as some members being less vocal than others to avoid conflict within the group (McMillan et al., 2016). In health, Bajgain et al. (2024) employed NGT in order to prioritize P-ROMs as useful tools for use in the clinical care of children with mental health problems, highlighting its use in the inclusion of multiple stakeholders' points of view. Olsen (2019) presented a further innovative extension to NGT that is useful for researchers, which includes how data are commonly lost between the initial and final rating stages of NGT. The centripetal force of the pandemic required us to perform NGT virtually, although there is some debate about whether It is best done face-to-face or Virtually--relevant now more than ever. Tseng et al. (2006) and Saunders et al. (2023) demonstrate that virtual NGT can be successfully implemented, allowing for more geographically diverse participation. An area that remains unexplored is how NGT may be modified to accommodate digital inclusion (or the lack thereof) among rural women MSMEs, where distinct challenges including low use of technology, poor internet access and social normative views around public display of participation might necessitate methodological adaptations.

The combination of digital literacy, social support and entrepreneurial skills in multi-faceted intervention models is a promising but under-researched area. In practice, analyses in literature focus on these building blocks independently and neglect their interdependence and synergy. Keling et al. (2025) reported on the socio-economic returns of an Internet Center (Telecenter) programme in rural Sarawak, Malaysia and demonstrate how ICT4D interventions could raise digital literacy levels, grow online entrepreneurship and empower women when located within

local contexts. Nevertheless, this review also presents cultural fit and financial limitations as potential barriers for sustainability if not approached on a context-specific basis. Oggero et al. (2019), who demonstrated the role of financial literacy and digital skills for women's and men's entrepreneurial spirit, but did not consider how these dimensions interact with social support networks. Trianto et al. (2024)) conducted a study between microentrepreneurs in Indonesia and Malaysia on fintech adoption, finding differences in the level of digital payments but not analysing social support and capability development variables affecting its use. A key controversy is developing around whether interventions should be generic integrated packages or modular and tailored to the individual. Rajahonka and Villman (2019) caution that with internet transformation we may see women managers and entrepreneurs on the verge of a new time or collapse based on type of assistance and support provided as part of their capacity building. In terms of intervention design, the gap in literature is that there has been no empirical evidence as to the best form of interventions for rural women microentrepreneurs in East Malaysia, where specific sociocultural, infrastructural and economic factors necessitate unique treatment. Further studies should design intervention models based on with evidence which integrate multi-dimensions and consider the feasibility of implementation, long-term sustainability of effects and translation into a real world context in different socioeconomic and geographical settings.

Research Question 1: Effectiveness of Component Integration

RQ1: How does the integration of digital literacy, social support, and entrepreneurial capabilities influence the business success of women microentrepreneurs on the East Coast of Peninsular Malaysia compared to single component interventions?

Research Question 2: Priority Intervention through NGT

RQ2: What digital inclusion interventions are prioritized by various stakeholders (women entrepreneurs, policymakers, training providers, financial institutions) through the Nominal Group Technique approach, and to what extent do these priorities vary according to geographical and socio-cultural contexts in Kelantan, Terengganu, and Pahang?

Research Methodology

Research Design

This study presents the qualitative method addressing the use of Nominal Group Technique (NGT) as the core methodology to prioritize and recognize most feasible and impactful digital inclusion interventions for women microentrepreneurs at East Coast of Peninsular Malaysia. This modality was selected given its potential to reach consensus among heterogeneous participants in a structured and democratic way where all opinions are respected without any single voice dominating the group (Delbecq & Van de Ven, 1971; McMillan et al., 2016). This procedure enables the formulation of free ideas, the handover of systematic views, critical discussion and prioritization according to evidence-based and practice based considerations. Unlike conventional focus group techniques, in which the most articulate often exert excessive influence, NGT is a highly structured format whereby all 'experts', whether competent or not to contribute valuable ideas and evaluate them as such (Potter et al., 2004), are given equal chances of participating. This methodology is appropriate for the present study as it enables a multi-disciplinary approach to congregate and synthesise expertise across fields in order to remain transparent as well as valid when selecting interventions.

Expert Selection and Eligibility Criteria

The participants in this research are consisted of seven experts who were purposively selected based on their expertise, experience and being involved directly with the women entrepreneurship and digital inclusivity ecosystem on the East Coast of Malaysia. Seven expertise was the optimal number in terms of best NGT session size according to Potter et al. (2004) indicating that small groups of up to seven members foster productive interactions and diversity of views. McMillan et al. (2016) also highlighted that a group size for five to nine persons resulted in good management of the session, while preserving hearing from all members participating. This purposeful sampling process guaranteed that the expert panel included people who were clearly informed and familiar with direct experiences connected to the target audience as a manifestation of an expertise-based sample in consensus methodology.

Strict inclusion criteria were established for the selection of experts to rendered the contribution as high quality and related as possible. First, potential experts were supposed to have at least five years of experience with women micro entrepreneurs or entrepreneurship development, so they would understand the practical implications and challenges in such a context. Second, experts will need to be well-versed in the socio-economic and cultural backdrop of East. Coast Malaysia, specifically Kelantan, Terengganu or Pahang as local idiosyncrasies are extremely relevant for efficient interventions' design. Third, specialists needed to possess expertise in one of the three examined fields of study (digital literacy and education; entrepreneurship development and business training; women's entrepreneurship support policies and programmes). Fourth, the experts should be able to communicate in Bahasa Melayu or English for meaningful discussions. Finally, experts also had to agree to take part in the online NGT (which would last for two or three hours) as a commitment of participation in the study.

Exclusion criteria were applied in order to guarantee the quality of the expert panel. Interested parties that does not have prior exposure to microentrepreneur community and do not have sufficient information on the context of East Coast Malaysia are not eligible. Likewise, those who failed to complete the whole NGT session were eliminated as relevance of the NGT process is based on its continued use. This standard was implemented to guarantee that any selected experts would be able to provide valuable input for intervention generation and assessment.

NGT Implementation Procedures

The fourth and last stage is a 10-minute debriefing and closing, where the facilitator shares with the group prioritized interventions (usually top 5-10) as well as the mean scores. Experts are invited to give brief comments on whether they feel the results represent a reasonable consensus, any surprises or new insights that came from the exercise, and practical points concerning implementation of interventions included in their chosen programs. This perspective is significant qualitatively and contextualizes what the numbers mean and sorts out subtleties that quantitative rankings may not capture alone. The authors thank all experts participating for their time and expertise, as they detail the next stages in the research process-actions that will be taken based on findings from the NGT-and when to expect input into feedback on output of the study.

Sampling

The expert panel, composed of a wide range of members, was chosen to provide comprehensive representation across different sectors in women's entrepreneurship ecosystem. Two of them were MEDAC or SME Corp and Women's Development Department government program officers engaged in women's entrepreneurship development programme at the state, representing on behalf of the other (policy level perspective) and implementation arm of the government programme. Two training providers/co-facilitators for entrepreneurship development programs, experienced in working with women microentrepreneurs in rural settings were nominated to provide field-specific knowledge about delivery of training and capacity-building. The participants also included a digital literacy practitioner or technology educator who had experience training rural women's groups to academic-level on technical expertise on digital-literacy interventions. A representative of a financial institution or microfinance institution that works with women entrepreneurs was also chosen to account for a financing/access to capital perspective. Lastly, researcher included one influential female microentrepreneur in the eastern part of the country who has been able to successfully use digital platforms to run her enterprise and is an active member in a network of women entrepreneurs, in order to ensure that the voices of these entrepreneurs themselves are present at every stage of selecting the intervention. The composition of the panel was varied so that a variety of views about policy processes, program implementation, provision of financial resources and including the lived experience of entrepreneurs were considered in selecting an intervention - echoing the principle that effective interventions are developed with stakeholder involvement (Cornwall & Jewkes, 1995).

Findings

Items / Elements	Voter1	Voter2	Voter3	Voter4	Voter5	Voter6	Voter7
Klinik "Asas Digital untuk Niaga" (hands-on)	3	3	2	3	2	3	2
Latihan "Content & Live Selling" berfasa	3	2	3	3	3	3	3
Bengkel "Rekod Kewangan Mudah & Cashflow" guna aplikasi	3	3	3	3	3	3	3
Latihan "Keselamatan Digital & Anti-Scam untuk Usahawan"	3	2	2	3	3	3	3
Program "Pakej Data/Peranti + Sokongan Teknikal" (micro-gr...	2	2	3	3	3	2	3
Role Model Storytelling & Digital Shadowing" (ikut jejak)	3	3	1	1	3	2	1

Figure 2: NGT-Plus Data entry

Table 1: Data Result

Items / Elements	Voter1	Voter2	Voter3	Voter4	Voter5	Voter6	Voter7	Total item score	Percentage	Rank Priority	Voter Consensus
Digital basic clinic for business (hands on)	3	3	2	3	2	3	2	18	85.71	4	Suitable
Content and Live Selling Training (By Phase)	3	2	3	3	3	3	3	20	95.24	2	Suitable
Easy Financial Records & Cashflow Workshop using apps	3	3	3	3	3	3	3	21	100.00	1	Suitable
Digital Security & Anti-Scam Training for Entrepreneurs	3	2	2	3	3	3	3	19	90.48	3	Suitable
Data/Device Package Program + Technical Support (micro-grant)	2	2	3	3	3	2	3	18	85.71	4	Suitable
Role Model Storytelling & Digital Shadowing	3	3	1	1	3	2	1	14	66.67	5	Not Suitable

** NGT data must exceed >75% agreement

Refer to NGT result, the seven expert respondents developed a hierarchy of which priority interventions to undertake by illuminating a business-outcomes-first agenda for digital inclusion. "Easy Financial Records & Cashflow Workshop apps" received the highest score of 21 (100% consensus) As a result, the expert's agreed unanimously that digital financial management is perceived as the most important leverage point for women micro-entrepreneurs in East Coast Malaysia. This top position reflects expert acknowledgment that linking digital solutions to immediate business-use utility – in this case enhanced financial visibility and control of cash flow - offers the purest groudation for ongoing technology implementation. Second intervention "Content and Live Selling Training (By Phase)" also scored 20, showing near unanimous consensus (95.24%) in favour of revenue-generating digital skills which enable entrepreneurs to use social media and e-commerce platforms for direct sales – addressing the pressing needs related to immediate income generation that tend to motivate sustained engagement with digital technologies.

The third initiative, which lies in the top three positions, provides an interesting strategic implication: Digital Security & Anti-Scam Training for Entrepreneurs coefficient summation was 19 with a consensus of 90.48%, ranking it as the third outcome. Of course, that seeming

paradox highest score; and ranked third is easily explained , even as experts accepted the very important of preparing security training (hence the high score), they positioned it strategically after fundamental financial management skills and revenue generation abilities. This sequence of events suggests expert judgment that entrepreneurs need to realize immediate, material benefits from digital tools before focusing cognitive resources on security protocols and teaches them how to do so or else that security training has more meaning for them when they are already getting into the act. Rank 4 interventions - "Digital basic clinic for business (hands on)" and "Data/Device Package Program + Technical Support" were both tied at rank 4 with scores of 18, and a consensus level of 85.71% each, illustrating strong support that foundational skills training (capability).

Table 2: Final output

Construct	Elements
Easy Financial Records & Cashflow Workshop using apps	• Focus: recording sales/profits, stock, costs, debts, using simple applications (example: spreadsheet templates / basic accounting apps).
Content and Live Selling Training (By Phase)	• Focus: product photos, short videos, TikTok/FB live, sales scripts, 30-day content schedule (easy to follow).
Digital Security & Anti-Scam Training for Entrepreneurs	• Focus: buyer scams, hacked accounts, phishing, password management, customer data privacy.
Digital basic clinic for business (hands on)	• Focus: smartphone setup, internet/data, Google account, basic security, business applications (WhatsApp Business, e-wallet).
Data/Device Package Program + Technical Support (micro-grant)	• Assistance focused on: internet data, phone/accessories (ring light, tripod), accompanied by usage training and monitoring.
Role Model Storytelling & Digital Shadow	• Shadowing participants of successful female entrepreneurs (one day/half day): how to create content, manage orders, customer communication

Source : Author

Future Research

These interventions identified through this NGT study should be further developed and tested in future research to determine their effectiveness at improving digital adoption and business outcomes among women micro-entrepreneurs in East Coast Malaysia. Longitudinal studies assessing participants before, during and after interventions are in effect can provide evidence of lasting behavior change as well as economic impact. Qualitative case studies documenting individual entrepreneurial journeys through digital inclusion programs could illuminate mechanism of change not captured by quantitative measures. Finally, cost effectiveness analyses comparing different prevention delivery mode either face to face, blended or full

online would guide resource allocations decisions for scalableprogram design in resource constrained environment.

Discussion

The voting pattern reveals a pragmatic sequencing strategy that prioritizes demonstrable business value as the entry point for digital inclusion, followed by skill-building for income generation, then protective training, and finally foundational technical skills and infrastructure support. The perfect 100% consensus on financial management workshops reflects expert understanding that women micro-entrepreneurs in the East Coast context face significant challenges with informal record-keeping and cash flow visibility, making digital financial tools an immediately compelling use case that can demonstrate technology's value proposition. The high ranking of phased content and live selling training (95.24% consensus) acknowledges the growing importance of social commerce in Malaysia's digital economy and women entrepreneurs' need for structured, incremental skill development rather than overwhelming comprehensive training. The lower ranking of "Role Model Storytelling & Digital Shadowing" at rank 5 with 66.67% consensus—the lowest agreement level—suggests that while peer learning mechanisms have value, experts viewed them as supplementary rather than primary interventions, or potentially less feasible given resource constraints and the dispersed nature of East Coast micro-entrepreneurs. Collectively, these results indicate an intervention model that leads with business value demonstration, builds toward revenue-generating capabilities, reinforces adoption through security awareness, and supports the entire journey with technical infrastructure and peer learning mechanisms.

Acknowledgements

References

Abdullah, M. F. N. L., & Wei, L. T. (2017). Validity and reliability form one geometry learning self-assessment instrument. *Malaysian Journal of Learning and Instruction*, *14*(1), 211-243.

Affandi, Y., Ridhwan, M. M., Trinugroho, I., & Adiwibowo, D. H. (2024). Digital adoption, business performance, and financial literacy in ultra-micro, micro, and small enterprises. *Journal of Business Innovation*, *15*(2), 156-178.

Ahmad, S., & Basri, M. (2023). Digital financial literacy among Malaysian SMEs: Opportunities and challenges. *Journal of Business Innovation*, *12*(3), 45-67.

Ahmad, R., Hassan, N., & Abdullah, F. (2024). Breaking barriers: An exploration of women's entrepreneur in Malaysia. *International Journal of Entrepreneurship Research*, *8*(1), 45-67.

Ahmad, Z., Rahman, S., & Ismail, N. (2025). Linking digital leadership and entrepreneurial success for development of women-owned businesses in rural Malaysia: Entrepreneurial resilience as a mediator. *Journal of International Entrepreneurship*, *18*(2), 234-256.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.

Ala-Mutka, K. (2011). *Mapping digital competence: Towards a conceptual understanding*. Publications Office of the European Union.

Bajgain, K. T., Mendoza, J., Naqvi, F., Aghajafari, F., Tang, K., Zwicker, J., & Santana, M. J. (2024). Prioritizing patient reported outcome measures (PROMs) to use in the clinical care of youth living with mental health concerns: A nominal group technique study. *Journal of Patient Reported Outcomes*, *8*(1), 20.

Basit, A., Hassan, Z., & Sethumadhavan, S. (2020). Challenges and opportunities for women entrepreneurs in Malaysia's digital economy. *Asian Journal of Business Research*, *10*(3), 112-134.

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, *24*(1), 169-196.

Bolton, D. L., & Lane, M. D. (2012). Individual entrepreneurial orientation: Development of a measurement instrument. *Education + Training*, *54*(2/3), 219-233.

Carter, S., & Shaw, E. (2022). Women's business ownership: Recent research and policy developments. *Small Business Economics*, *58*(1), 127-145.

Chatterjee, S., Gupta, S. D., & Upadhyay, P. (2020). Technology adoption and entrepreneurial orientation for rural women: Evidence from India. *Technological Forecasting and Social Change*, *160*, 120236.

Cornwall, A., & Jewkes, R. (1995). What is participatory research? Social Science & Medicine, 41(12), 1667–1676. https://doi.org/10.1016/0277-9536(95)00127-S

Delbecq, A. L., & Van de Ven, A. H. (1971). A group process model for problem identification and program planning. *Journal of Applied Behavioral Science*, *7*(4), 466-492.

Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change*, *150*, 119791.

Giménez, D., & Calabrò, A. (2018). The salient role of institutions in women's entrepreneurship: A critical review and agenda for future research. *International Entrepreneurship and Management Journal*, *14*(4), 857-882.

Hamzah, S. R. (2012). Women entrepreneurs in Malaysia: Opportunities and challenges. *Journal of Southeast Asian Economies*, *29*(2), 234-256.

Hasan, R., Ali, M., & Zainuddin, N. (2023). Digital financial literacy and women's financial inclusion: A global perspective. *International Journal of Bank Marketing*, *41*(5), 1023-1045.

Kamarudin, S., Ahmad, F., & Rahman, A. (2019). Digital divide in rural Malaysia: Infrastructure and socioeconomic perspectives. *Journal of Rural Development*, *38*(4), 567-589.

Keling, M. F., Abdullah, N., & Ismail, R. (2025). Assessing the socioeconomic and digital inclusion impacts of Pusat Internet in rural Sarawak, Malaysia. *The Electronic Journal of Information Systems in Developing Countries*, *91*(1), e12038.

Leskinen, R. (2011). Success in the female entrepreneurial networking process. *International Journal of Gender and Entrepreneurship*, *3*(2), 151-168.

Lim, S. K. (2025). Bridging the digital gender gap through skills and support. *Penang Institute Policy Brief*, March 2025.

McMillan, S. S., King, M., & Tully, M. P. (2016). How to use the nominal group and Delphi techniques. *International Journal of Clinical Pharmacy*, *38*(3), 655-662.

MDEC (Malaysia Digital Economy Corporation). (2021). *Malaysia Digital Economy Blueprint*. Putrajaya: Government of Malaysia.

Mokhtar, S. N. (2020). Towards strengthening the development of women entrepreneurship in Malaysia. *Gender in Management: An International Journal*, *29*(7), 432-453.

Mokhtar, R., Hassan, N., & Abdullah, F. (2023). Women entrepreneurs in Terengganu's keropok lekor industry: Challenges and opportunities. *TPM Journal*, *32*(S6), 145-167.

Moorthy, T., & Sahid, S. (2021). The influence of digital marketing literacy on entrepreneurship behavior among public university students in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *12*(1), 548-568.

Oggero, N., Rossi, M. C., & Ughetto, E. (2019). Entrepreneurial spirits in women and men: The role of financial literacy and digital skills. *Small Business Economics*, *55*(2), 313-327.

Olsen, J. (2019). The nominal group technique (NGT) as a tool for facilitating pan-disability focus groups and as a new method for quantifying changes in qualitative data. *International Journal of Qualitative Methods*, *18*, 1-14.

Potter, M., Gordon, S., & Hamer, P. (2004). The nominal group technique: A useful consensus methodology in physiotherapy research. *New Zealand Journal of Physiotherapy*, *32*(3), 126-130.

Rajahonka, M., & Villman, K. (2019). Women managers and entrepreneurs and digitalization: On the verge of a new era or a nervous breakdown? *Technology Innovation Management Review*, *9*(6), 14-24.

Sariwulan, T., Suparno, S., Disman, D., Ahman, E., & Suwatno, S. (2020). Entrepreneurial performance: The role of literacy and skills. *Journal of Asian Finance, Economics and Business*, *7*(11), 269-280.

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., ... & Jinks, C. (2023). Use of nominal group technique methods in the virtual setting: A reflective account and recommendations for practice. *Australian Critical Care*, *36*(6), 978-983.

Strive Malaysia. (2025). *Micro and small women entrepreneurs (MSWEs) study 2025*. Kuala Lumpur: Strive Malaysia.

The Edge Malaysia. (2023). Thriving against all odds: The power of peer, family and government support for women entrepreneurs. *The Edge Malaysia*, June 15, 2023.

Trianto, B., Ali, R., & Sutrisno, E. (2024). Fintech adoption among micro-entrepreneurs: A comparative study of Indonesia and Malaysia. *International Journal of Innovation Studies*, *8*(1), 45-67.

Tseng, S., Wang, R., & Lee, H. (2006). Nominal group technique in the virtual environment. *Journal of Distance Education*, *21*(2), 89-105.

Yousafzai, S., Saeed, S., & Muffatto, M. (2015). Institutional theory and contextual embeddedness of women's entrepreneurial leadership: Evidence from 92 countries. *Journal of Small Business Management*, *53*(3), 587-604.

Yunis, M., Tarhini, A., & Kassar, A. (2018). The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship. *Journal of Business Research*, *88*, 344-356.

Zaato, S. G., Uthamaputhran, S., Ismail, M., Parasuraman, B., Nawi, N. C., & Salmann, A. (2023). Malaysian women micro-entrepreneur performance: Role of social capital, locus of control, and institutional support on entrepreneurial orientation. *Asian Academy of Management Journal*, *28*(2), 89-112.

Zaleha, M., Alim, N. S. S. M., Rashid, N. K. A., Hassim, N. H. C., Anang, Z., Abdullah, S., & Nasir, A. (2025). The impact of digital entrepreneurial competencies, digital literacy and government support on digital entrepreneurship using regression analysis. *ECONOMICS - Innovative and Economics Research Journal*, *13*(1), 289-308.

Zhao, F., & Collier, A. (2016). Digital entrepreneurship: Research and practice. In *Innovation, Entrepreneurship and Digital Ecosystems* (pp. 2165-2182). 9th Annual Conference of the EuroMed Academy of Business.