

How To Drive Women Entrepreneurship And Empowerment Through Digital Technology? Quadruple Helix Approach

Bagaimana Mendorong Kewirausahaan Dan Pemberdayaan Perempuan Dengan Teknologi Digital? Pendekatan Quadruple Helix

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ABSTRACT

This paper investigates the role of digital technology to develop inclusive entrepreneurship and promote empowerment among disadvantaged groups with specific focus on women through a quadruple helix approach. Utilizing qualitative methods, the study conducts in-depth interviews with stakeholders representing government, industry, academia, and civil society in Greater Jakarta. Employing purposive sampling, respondents are selected to ensure diverse perspectives. The research provides a comprehensive understanding of the impact of digital entrepreneurship development on the empowerment of disadvantaged groups, highlighting digital technology role in development of women entrepreneurship and empowerment. The findings underscore the significance of digital technology in driving inclusive entrepreneurship development, particularly in the context of disadvantaged communities.

Keywords: Digital Technology, Women Entrepreneurship, Women Empowerment, Development Models, Quadruple Helix

ABSTRAK

Penelitian ini menginvestigasi peran teknologi digital dalam mengembangkan kewirausahaan inklusif dan mendorong pemberdayaan di antara kelompok yang termarginalkan dengan fokus khusus pada perempuan melalui pendekatan quadruple helix. Dengan menggunakan metode kualitatif, studi ini melakukan wawancara mendalam dengan para pemangku kepentingan yang mewakili pemerintah, industri, akademisi, dan kelompok masyarakat sipil yang berlokasi di Jabodetabek. Dengan menggunakan metode purposive sampling, responden dipilih untuk memastikan adanya perspektif yang beragam. Penelitian ini memberikan pemahaman yang komprehensif mengenai dampak pengembangan kewirausahaan digital terhadap pemberdayaan kelompok-kelompok yang kurang beruntung, dengan menyoroti peranan teknologi digital dalam pengembangan kewirausahaan dan pemberdayaan perempuan. Temuan ini menggarisbawahi pentingnya teknologi digital dalam mendorong pengembangan kewirausahaan yang inklusif, terutama dalam konteks masyarakat yang termarginalkan.

Kata Kunci: Teknologi Digital, Kewirausahaan Perempuan, Pemberdayaan Perempuan, Model Pengembangan, Quadruple Helix

1. Introduction

In the contemporary landscape of global business, digital technologies have emerged as transformative agents, fundamentally altering the way entrepreneurship is perceived, initiated, and sustained (Verhoef et al., 2021). The urgency of digital technology for entrepreneurship stems from its pivotal role in shaping the contemporary business landscape and driving sustainable growth. Digital technology has become a catalyst, reshaping traditional business models and presenting new opportunities for entrepreneurs to thrive (Pelletier & Cloutier, 2019). In today's hyper-competitive global market, businesses need to stay ahead to survive and succeed. Digital technologies enable entrepreneurs to streamline operations, optimize processes, and innovate at a pace that keeps them competitive in an ever-evolving marketplace.

Digital technologies offer cost-effective solutions for various aspects of business operations. Entrepreneurs can automate routine tasks, utilize cloud computing for scalable infrastructure, and employ data analytics for informed decision-making, all leading to resource optimization and enhanced profitability (Khin & Ho, 2018). The integration of digital

technologies into various aspects of entrepreneurial endeavors has become a hallmark of modern business practices, revolutionizing how ventures are conceived, operated, and scaled (Rupeika-Apoga et al., 2022). This empirical investigation seeks to unravel the intricate relationship between digital technology and entrepreneurship development, shedding light on the mechanisms through which digital advancements stimulate and shape entrepreneurial activities (Malatras et al., 2017).

Digital technology is a driving force behind innovation and disruption across industries. Entrepreneurs who embrace and integrate emerging technologies can create groundbreaking solutions, disrupt traditional industries, and gain a competitive edge. Digital technologies encompass a broad spectrum of tools and platforms, including but not limited to artificial intelligence, blockchain, internet of things (IoT), cloud computing, social media, and data analytics (Annarelli et al., 2021). These technologies have permeated all sectors of the economy, offering entrepreneurs new opportunities for innovation, market expansion, operational efficiency, and customer engagement (Fuerst et al., 2023). Understanding how entrepreneurs leverage these technologies is crucial for optimizing their impact on business growth and socio-economic development. Furthermore, development of new entrepreneurs based on digital technology such as digital technology can help to improve the odds of business success (Pratama et al., 2022).

Consumer behavior also rapidly shifting towards digital platforms for information, purchases, and engagement (Warner & Wäger, 2019). Entrepreneurs need to meet these changing expectations by embracing digital technologies to provide seamless and personalized experiences, enhancing customer satisfaction and loyalty. Investors and venture capitalists often prioritize startups and businesses that demonstrate a strong digital presence and leverage technology for growth. Entrepreneurs utilizing digital technologies effectively are more likely to attract funding and partnerships, essential for scaling operations. While research on digital entrepreneurship has attracted considerable research interest from scholars there is a considerable gap on research that explain how digital technology allow marginalized group to participate in entrepreneurship. In this case specifically, only a small size of study in this topic is focused on women entrepreneur (Bakker & McMullen, 2023).

With that consideration, this paper aims to fill the gap in existing literature by presenting an empirical investigation into the ways digital technologies influence women entrepreneurship development. This paper intends to analyze the multifaceted relationship between the application of digital technologies and the emergence of women entrepreneur with focusing on research question as follow: "how digital technology can support the development of women entrepreneurship?" "how digital entrepreneurship support women empowerment?" and "what is the component of an effective model to develop women entrepreneurship". The exploration of this topic will provide valuable insights for policymakers, industry practitioners, academics, and entrepreneurs. Policymakers can develop informed strategies to foster an enabling environment that promotes digital entrepreneurship, while industry practitioners can tailor their approaches to effectively harness the potential of digital technologies. Lastly, academics will gain a deeper understanding of the dynamics at play, guiding future research and educational curricula in the field of entrepreneurship and technology.

2. Literature Review

2.1. Entrepreneurship

The term entrepreneurship comes from the French "entre" which can be translated as "between" and "prendre" which means "to take". The term was originally used to describe those who take trade risks between sellers and buyers. It later expanded to become a term for those who undertake the work of starting a new venture. Entrepreneurship is the process by

which an entrepreneur gathers and integrates all the necessary resources such as designing a business model, creating an effective strategy, raising financial capital, assembling human resources and the ability to bear risks to transform an idea into a viable business.

There are many variations in the definition of entrepreneurship according to experts. Each definition has a different focus and view on the role of entrepreneurship in society. For example, Richard Cantillon, the originator of the classical theory of entrepreneurship, defines entrepreneurship with a focus on involvement in business activities. According to Cantillon, an entrepreneur is an individual who takes risks by buying a good at a certain price and selling it at an uncertain price to make a profit. In contrast to Cantillon who saw risk as the essence of entrepreneurship, Joseph Schumpeter focused on the role of entrepreneurship in innovation. Schumpeter attributed entrepreneurship not only to the organisation of a business, but rather to the continuous development of innovation and business (Mehmood, 2019). In this role, entrepreneurship ensures that business efficiency is continuously achieved through market pressures and the process of creative destruction by new firms that drive industry change by replacing older businesses, stimulating the level of innovation in the industry resulting in the opening of new markets and providing a greater variety of products, services and processes than existing firms (Doran et al., 2018).

Entrepreneurship has become increasingly important in the post-COVID-19 era due to its strong association with economic recovery. There is a consensus in the literature that entrepreneurship plays an important role in economic growth (Amorós et al., 2012; Olaison & Sørensen, 2014). Entrepreneurship is an essential element in the economic and social dynamics of a country. Entrepreneurship has a strong relationship with the process of value creation, exploitation of opportunities, and fulfilment of market needs (Purnomo et al., 2020). Entrepreneurship is also related to the source of economic growth and job creation. In the context of contemporary studies, entrepreneurial activity often emphasises a focus on the process of creating a new business or product that involves elements of innovation and creativity in it (Nambisan et al., 2019). Similarly, Guerrero et al. define entrepreneurship as an innovative and creative process that has the potential to add value to products, create jobs, increase productivity, vitalise and diversify markets, improve social welfare and broadly develop the economy (Guerrero et al., 2008).

2.2. Digital Technology

Information and communication technology (ICT) in general and the internet in particular have significantly transformed the economic landscape. With the development of ICT, all parties from upstream to downstream economic activities can now be connected in a shared virtual space. Furthermore, ICT also accelerates and facilitates the entrepreneurial process. With ICT, new businesses can be started with very small capital using internet technology (Mivehchi, 2019). In addition, digital technology opens up opportunities for the creation of new businesses and opportunities to open branches of old businesses to move from offline to online environments (Jafari-Sadeghi et al., 2021). According to Kraus et al. (2019). Digital transformation also encourages entrepreneurs to make changes in their business processes: digital entrepreneurship processes, digital ecosystems, platform strategies, digital strategies and digital social entrepreneurship (Kraus et al., 2019).

Researchers recognise digital technology is an essential tool for business today and with increased access to information it can facilitate women's empowerment by providing access to information, increasing initiative, encouraging participation, building personal and collective awareness, and finding solutions (Obayelu & Ogunlade, 2006). Digital technology also facilitates capacity building, creating opportunities through self-employment and overcoming the conflict of women's dual role demands to take care of the home while contributing to family welfare. The development and adaptation of ICTs such as the internet

and social media bring opportunities for women to actively engage as traders, producers and service providers (Fauzia, 2022). In addition, ICT skills can improve women's quality of life and self-confidence (Intel, 2012). Entrepreneurs, especially those working in small and medium-sized enterprises (SMEs), typically have weaknesses in conducting research and accessing information and other key innovation resources. The Internet and the use of ICT can help women entrepreneurs build networks that can help their businesses survive and withstand competitive pressures from large companies (Fauzi et al., 2020).

The growing importance of digital skills is reflected by research showing that almost all female respondents agree that participation in digital entrepreneurship and ICT implementation are the most important success factors (Pappas et al., 2018). However, there is currently a significant gap between women's digital entrepreneurship participation and women's ICT skills. This needs to be a concern because the growth of women's businesses is significantly influenced by the digital literacy of these women entrepreneurs (Fauzi et al., 2020). As a consequence, in an increasingly competitive business environment in this digital era, digital literacy is absolutely necessary for women entrepreneurs so that their businesses can grow.

The development of digital technology that gave birth to chat apps, social media, e-commerce and others is a powerful tool to increase gender empowerment. These digital technologies bring new sources of information and can open new communication channels for women entrepreneurs from marginalised communities. Women's empowerment through e-commerce requires a high level of training, gender analysis, planning, designing, implementation and monitoring assessment and paying attention to the impact on women's lives and their conditions (Hossain, 2018). Entrepreneurship has an important role in creating gender equality in various fields, including economic, social and political.

Recent research in cyberfeminism that explores the relationship between women and digital technology shows the tremendous potential of the internet as a medium for women's empowerment and emancipation (McAdam et al., 2020). It is important to become financially independent to increase women's empowerment, but it is very difficult to realise as women often have to choose between household duties or professional obligations. Virtual workspaces or business spaces are particularly promising for women entrepreneurs as such technologies reduce the likelihood and pressure of discrimination based on gender or other conditions (Shukla et al., 2021). Furthermore, virtual business spaces are relatively safer and accommodate the social pressures of women entrepreneurs in balancing household and professional roles.

However, the use and expertise of digital technologies is not a cure-all for the structural social and cultural issues affecting gender equality. There are various barriers that prevent entrepreneurs from marginalised positions from benefiting from the use of the internet in business. Women entrepreneurs who have relevant knowledge, are hardworking but lack access to the necessary social, cultural and material resources face difficulties (Dy et al., 2018). Opportunity creation through digital entrepreneurship can be categorised into three main perspectives. First, Conditions that break down inhibiting factors. In this case, digital technologies such as smartphone applications, the internet of things, big data, social media, 3D printing and so on create conditions that can break down the barriers and challenges generally faced by women in the entrepreneurial process. Second, the perspective of democratisation of access. The opening of options and access to information, resources and knowledge made possible by digital technology, Lastly, Network perspective which digital technologies help the process of forming social networks and social capital for access to multidisciplinary knowledge and information and contribute to the quality of decision-making in entrepreneurship (Paoloni et al., 2018).

The role of digital technology as a breaker of barriers to women's entrepreneurship is very important because women experience barriers related to lack of access to funding, limited financial resources, male-dominated community culture, marketing problems, production problems, pressure of household duties, low ability to bear risks, and lack of information (Franco & Kumar, 2016).

3. Research Methods

The research design of this study is exploratory and descriptive. The research design will allow this study to uncover nuanced patterns, themes, and connections within the data. This study adopts a qualitative research approach to investigate the ways in which digital technology drives entrepreneurship development. Qualitative research is chosen for its ability to provide in-depth insights and understanding of the complex and multifaceted relationship between digital technologies and women entrepreneurship. Application of qualitative method allows for the exploration of various perspectives, motivations, behaviors, conditions, factors and social-economic context that shape the development of women entrepreneurship (Khursheed, 2022). Qualitative research provides flexibility in data collection and analysis, allowing for an open-ended exploration of the subject matter. The research respondents were 10 people who came from various stakeholders based on the quadruple helix innovation theory, namely: academics, practitioners, government and community groups. In this research, the sampling method used is purposive sampling technique, namely the selection of samples based on the fulfillment of certain criteria to achieve research objectives. This study will focus on respondent from Greater Jakarta Area.

The primary data collection method for this research is to use in-depth interviews with resource persons who have expertise and experience in the field of entrepreneurship development. The in-depth interview method is used in consideration of the complex and dynamic nature of the research problem so that in-depth and contextual knowledge is needed to solve the research problem. In addition to the primary data, this research uses secondary data collected from previous research journal articles, books, reports or official publications. Primary data that has been collected is then analyzed. Furthermore, the results of the analysis were triangulated by combining theory, secondary data and interviews between respondents to test the validity and reliability of primary data (Noble & Heale, 2019). The triangulation method in social science refers to the process where research wants to verify the results and findings of research by showing independent measurements by combining several perspectives and methods. In this case, a combination of two or more theories, data sources, methods or investigators is used in conducting one research on one phenomenon to meet one point of reliable results (Yeasmin & Rahman, 2012).

4. Results and Discussions

Based on primary data derived from interviews with respondents as shown in Table 1, 70% of the interviewees have postgraduate education, while 30% have undergraduate education. Then from the age range of respondents, 30% is at 30-39 age group, 30% of the 40-49 age group, 10% of the 20-29 age group, 20% at the 50-59 age group and 10% at 60-69 age group. Furthermore, in terms of background, 40% of respondents came from entrepreneurs, 20% from the state official, 20% from non-governmental organizations and 20% from academia.

Table 1. Respondent Background and Demographic Profile

Respondent	Age Group	Background	Education
Ms KT	30-39	Civil Society	S2
Mrs W	30-39	Entrepreneur	S1
Mr AF	40-49	State Official	S2
Mrs I	50-59	Entrepreneur	S1
Mrs ER	40-49	State Official	S2
Mrs SH	40-49	Academics	S2
Ms R	20-29	Entrepreneur	S2
Mrs IP	60-69	Academics	S2
Mr EF	50-59	Entrepreneur	S1
Mrs EL	30-39	Civil Society	S2

Source: analyzed research data, 2023

As shown in Table 2, from the results of the interview data processing, several concepts relevant to the development of digital entrepreneurship to increase gender empowerment were found, namely: the influence of women's background conditions, access to infrastructure and devices, business ecosystem factors, women's motivation in starting a business, the importance of a mentoring approach, the weakness of digital skills, and the dimensions of empowerment achievement from digital entrepreneurship activities.

Table 2. Coding, Relationships and Concepts from Interview Result

Code/Node	Relationship Between Code	Grand Concept
Business motivation Economic pressure Helping family Independence Difficulty to find a job Pursuing opportunities	Intention to Start a Business	Women's Motivation for Entrepreneurial Activity
Internet network Communication devices E-commerce platforms Communication applications	The Digital Technology Infrastructure	Lack of availability of infrastructure and devices is an inhibiting factor for digital entrepreneurship.
Family support Household tasks Production and Digital Skills Economic Level	Family Conditions	Background conditions can challenge entrepreneurial capacity.
Application usage Internet safety Social media Content creation	Digital Technology Expertise	Limited digital technology skills as challenge for women
Marketing Innovation Digital Skills	Entrepreneurial Capacity	Weak entrepreneurial skills as a challenge for women entrepreneurship
Welfare Active in the community Respected by family Self-confidence Decision involvement	Women's Empowerment	Success in entrepreneurship promote opportunity to improve empowerment.
Business ecosystem Network Government support	Sustainability of entrepreneurial activity	Business sustainability requires the establishment of business networks and ecosystems.

Partner Linkages Gender Enrichment Mentoring	Program Approach	Mentoring by gender-knowledgeable partners is required to facilitate the enhancement of gender knowledge, entrepreneurial capacity and digital skills.
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Source: Results of Research Data Processing 2023

The analysis of the primary data shows that digital technology help women entrepreneurship through various aspect. Consistent with several previous studies, digital technology has various benefits that encourage increased empowerment of women (McAdam et al., 2020; Shukla et al., 2021; Ughetto et al., 2020). Based on the interview results, all respondents confirmed that digital technology support women's empowerment. Specifically, 70% of respondents mentioned that digital technology helps balance business management activities with household duties. Women are often constrained to start a business because of the obligation to take care of the house, digital technology facilitates that women can still do business without leaving their homes. This is as Mrs. SH stated that: "*Digitalization actually accommodates them to keep selling but also they don't need to leave the house, so they can still do business from home. I think that's one thing that helps.... so they can still do business, develop their business even from home without having to ignore household matters.*". This is in line with Mr. AF who commented: "*Women are commonly part-time entrepreneurs, who do business in their spare time. So digital technology is very helpful*". These findings support previous studies that found that digital tools and technological affordability provide a means to navigate social and cultural practices, which have historically limited women's work outside the home (McAdam et al., 2020).

Another benefit of digital technology to women's empowerment is opening access to information. 90% of respondents stated that digital technology helps access information. Women can use social media and the internet to obtain various information that is useful in starting a business and developing a business. Furthermore, 80% of responses also stated that digital technology increases access to resources for women. In this case, digital technology can be used by women to seek funding, obtain raw materials or supplies, or social capital, which is a factor in entrepreneurial production. This is reflected in Mr. AF's question as follows: "*Entrepreneurship has many tools, what knowledge do you want, just search on YouTube, there is, what platform do you want to choose, want efficient production, there are many certifications, so yes. So now the digital world has made it easier for entrepreneurs to do business. You can also access capital.*". Finally, 60% said that digital technology has a role in helping women to form professional networks in developing their businesses.

In addition, entrepreneurship also support improvement of women's empowerment. 80% of the respondents agreed that entrepreneurship enhances the 4 dimensions of women's empowerment according to (Kabeer, 1999) namely 'power within', 'power on', 'power over', and 'power with'. For example, in the self-power dimension related to self-confidence, women who do entrepreneurship can increase their self-confidence. This is as stated by Ms. K that: "*women's self-confidence is supported by engaging in entrepreneurship*". In line with these statements, Mrs. W's interview data also reflects the following findings: "*entrepreneurship does increase self-confidence*". This helps reduce cultural factors that can be the most comprehensive and burdensome form of subjugation for women to men (Ojediran & Anderson, 2020). Increasing self-confidence or the spirit of emancipation within oneself is an important factor in overcoming social and cultural barriers that limit women's power involvement with themselves. Gradual increase in self-confidence through entrepreneurship then slowly loosens or reduces their perceptions and the surrounding community regarding the limitations of women's abilities or rights (Mosedale, 2005).

Entrepreneurship also enhances women's empowerment related to the 'power to' dimension. The increase in 'power to' is reflected in women's greater involvement in the economic decision-making process of both the household, and/or the community. This finding is supported by respondents' statements such as: "*Working women usually have a strong position beginning in the family. So they also have a stake in family decisions. Well, in some cases like in Bantaeng there are also, actually in various regions I see many women who actually become champions.*" (Mrs. SH). This is consistent with several previous studies that show that women entrepreneurs have participation in household decision-making, are more active in socio-political activities (Ashraf et al., 2010; Morshed, 2015). An increase in the power to dimension influences self-confidence, level of self-empowerment, independence, and the ability to make independent decisions (Khursheed, 2022). Furthermore, in the dimension of power over, women who do entrepreneurship have greater access and control over financial, physical and knowledge assets related to their business. For example, with entrepreneurship, women who previously had no income then have income that can be managed more freely by these women. Likewise, physical production assets such as equipment and tools used by women who are entrepreneurs tend to be controlled by themselves and not intervened by their partners. The following interview data is a representation of this analysis: "*With the entrepreneurship development program, one of the benefits is that the beneficiaries (women) open up their opportunities or access to the economy when they use technology*" (Mrs. W). Improved welfare or control over financial resources is closely related to women's empowerment. This finding is in line with (Ojediran & Anderson, 2020) where financial independence creates autonomy or agency in women.

Women entrepreneurship development program needs to consider their empowerment to allow women become an effective entrepreneur with power to make decision in their business. Before carrying out assistance, it is necessary to assess the interests, needs and circumstances of the women concerned in order to design an effective program. The assessment is based on Mr. AF's statement that: "*where we first look at their interests, whether they are interested in entrepreneurship, only after that we will provide them with assistance.*" In line with this statement, Mrs. ER stated: "*indeed, digitalization itself has challenges in our opinion because each region and each person has different capacities so that the programs provided are also different, for example, the easiest is of course we digitize through, we help and we provide assistance.*" Understanding the needs of gender is needed to overcome the obstacles faced by women in entrepreneurship (Ismail, 1996). Therefore, framework of an effective women's entrepreneurship development it needs to be linked with empowerment model which based on the analysis of interview data can be shown in figure 1.

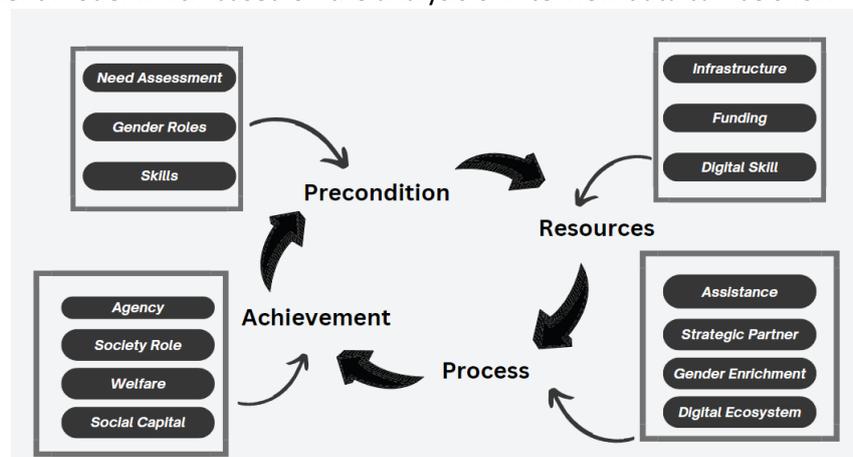


Figure 1. Women Digital Entrepreneurship Development Model

Source: analyzed research data, 2023

First, effective women entrepreneurship development model shall be started with the precondition analysis stage. The preconditions analysis is conducted with a needs assessment to find out what factors then make it difficult or hinder women in making related decisions. This needs assessment stage then becomes the basis for designing an effective approach. This can be seen from the statement of Respondent Miss KT who said: "*the program design should be based on the need assessment, for example, it's clear that you need to know how to do this, and sometimes the beneficiary does not access to the gadget or internet*". The needs assessment process is in line with the view that empowerment is a multidimensional process where gender inequality exists across multiple dimensions with causal pathways of resources translated into agency can also vary: material, perceptual, relational, and cognitive (Mahmud et al., 2012).

Designing an effective engagement model must further take into account prevailing gender roles. Gender roles here relate to expectations or general images that live in the surrounding community regarding what women should do, and what women should not do. Gender roles in this case affect the conditions of empowerment because gender roles can form a pressure not to do something or encourage someone to do something. The influence of gender roles is illustrated in the interview with Mr. AF where: "*women do entrepreneurship on average part-time, in their spare time, a side business. Their first business is taking care of the family.*" Mrs. EL also stated that: "*she becomes an inspiration for the larger community so that especially if she is balancing between being an entrepreneur and being a good mother or wife at home*". Therefore in this case, it is necessary to consider how stereotypical roles and gender roles can keep women away from domain attitudes or achievements associated with entrepreneurial behavior, placing them in roles close to housework, caring for their children and parents (Rubio-Bañón & Esteban-Lloret, 2016).

Considered at the precondition stage to design an effective women digital entrepreneurship program is the skill factor possessed by the women. The skills that need to be considered here can include basic business skills in general such as production skills, creativity, financial management, marketing, as well as digital technology skills and literacy. The implication of the low digital technology literacy and skills aspect requires the enrichment of skills first to improve the ability of related women. Conversely, for women who have good digital literacy and abilities but basic business skills are generally not good, the program design can focus on improving these general business skills and linking the application of digital technology use in the business. The second process in the resource-related model relates to the first dimension of empowerment which includes not only material resources but also a variety of human and social resources that enhance the ability to make choices or decisions. Access to important resources is also related to entrepreneurial activity. In entrepreneurship, access to financial capital is one of the critical factors in the long-term success of start-up businesses (Cooper et al., 1994; Khan et al., 2019). Human capital which includes an individual's knowledge and capacity to perform a task affects the outcome of entrepreneurial activities such as the startup stage, initial market penetration, business survival and managing the growth stage. Furthermore, social capital in entrepreneurship also provides various benefits such as information, legitimacy, trust and emotional support (Klyver & Schenkel, 2013). In addition, from the resource-based view perspective, the competitive advantage of a firm or entrepreneur results from the resources available and accessible to the firm rather than the position of their product in the market.

In the context of empowering women with digital entrepreneurship, access to resources plays an important role because without access to key resources, namely infrastructure, digital skills, and funding, women cannot engage in digital entrepreneurship activities. Infrastructure in this case relates to the basic equipment and supplies needed in digital entrepreneurship such as internet networks in related areas, availability of devices to

access the internet and other supporting infrastructure. The importance of the availability of supporting infrastructure was stated by Ms KT that: *"First, we need to improve the advocacy or have internet access at the village office, for example in the meeting room at the Village Head's headquarters where we can get business actors because that is always a problem, the internet is difficult"*. In addition, there are also obstacles in access to electronic devices needed to carry out digital entrepreneurship as revealed by Miss KT that: *"There is also the matter of strengthening your own understanding of you as a woman because yes, we also captured that in the need assessment that women can't have cellphones."*

Within the framework of the women's empowerment model, the process stage relates to the agency dimension of power. Agency in this case relates to the ability to define a goal and act to realize that goal. Agency is more than just observable actions, it also includes the meaning, motivation and purpose that individuals bring to their activities or power within. At this stage of the process, there are several things that can be done to increase the agency dimension of women's empowerment with digital entrepreneurship, namely: mentoring, conducting gender enrichment, building digital ecosystems, and building partner networks. The mentoring approach needs to be applied considering that women are limited by their gender role duties at home, as well as their effectiveness in bringing about change. This is based on a statement from Mrs. SH that: *"I think our door-to-door training mentoring model is quite effective rather than bringing the women to the training venue because it takes time for them and if they are accompanied at home they are also more focused, so if they are visited one by one, they are more focused than if they listen together, it is not effective."*

The implementation of effective mentoring is carried out by involving partners consisting of various stakeholders such as universities, government agencies, non-governmental organizations, and elements of the community itself. The involvement of all stakeholders increases the potential success of the mentoring program. The importance of the involvement of various stakeholders is reflected in Mrs. ER's statement that: *"We are more intense in connecting the dots, connecting various strategic partners in the area, to be able to encourage entrepreneurial development. Who are the partners? There is the local government office in charge of cooperatives and MSMEs, then also the community, whether it is a local, national or NGO community, then also the industrial world, the world of education and also the community in general and also other strategic partners. But the real point is that we want to build pentahelix collaboration in the area, in the region. Why is that important? Because actually building a conducive ecosystem will create sustainability."* The importance of the involvement of various stakeholders is consistent with research results (St-Jean & Tremblay, 2020) which show that mentoring programs provide extensive learning benefits and enhance the development of self-efficacy.

The entrepreneurial ecosystem element at the process stage relates to the support system for the formation of social capital and networks between stakeholders of women entrepreneurs. The concept of entrepreneurial ecosystem in this case is an interrelated agglomeration of individuals, institutions, organizations, and regulatory entities in a particular geographic area that act on and promote entrepreneurial initiatives and actions (Neumeyer et al., 2019). A good ecosystem supports the benefits and sustainability of the business to continue after the mentoring is completed. This is as stated by Mrs. SH that: *"A good ecosystem is like for example there is an Integrated Business Service Center from the Ministry of Cooperatives, business consultants, then there are also business people or the private sector who are also involved, then what is important is that there are NGOs or philanthropy institutions that are also there involved. We chose these criteria so that what we want to build is a collaboration for women's economic assistance and empowerment so that the empowerment and results will be more sustainable."* In line with this, Mrs. ER said that: *"the ecosystem is formed in the area, so in the end without us, without our involvement, the*

ecosystem in the area is already conducive to the creation of new entrepreneurs." The role of the entrepreneurial ecosystem as a factor in business success and sustainability is in line with research (Stam & de Ven, 2019) which shows that the quality of the entrepreneurial ecosystem is related to emerging high-growth businesses in the region.

5. Conclusion

Based on the research conducted, digital technology support women entrepreneurship through as enabler and empower factor in the entrepreneurial process. First digital technology support women entrepreneurship by facilitating access to resources, access to information, network formation and minimize gender barriers. In addition, digital technology and entrepreneurship activity has important role in women's empowerment. Most notably entrepreneurship can support improvement in 4 dimensions of women's empowerment.

An effective model of women entrepreneurship and empowerment development can be designed based on mentoring women to do digital entrepreneurship. Mentoring is an effective approach due to the consideration of factors that inhibit women in carrying out entrepreneurial activities, which include family duties, limited access to resources, weak gender equality perspectives and knowledge, and low basic digital skills. The development of digital entrepreneurship to enhance women's empowerment starts with conducting a needs assessment first to determine the preconditions, and existing resources to then be considered in designing an effective programme. After the needs assessment is conducted, an effective programme needs to ensure the availability of resources needed to undertake digital entrepreneurship. The availability of these resources is then transformed into digital entrepreneurship through the mentoring process. After providing assistance through partners, the task of stakeholders is to help sustainability of digital entrepreneurship activities that have been carried out by building a supportive digital ecosystem. This is done so that the entrepreneurial activities carried out can run independently.

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