



Determinants of eco-innovation capabilities adapted by Malaysian SMEs during the COVID-19 pandemic

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Abstract

Today's businesses must deal with difficult economic circumstances, including fallout from the COVID-19 pandemic. This has had a direct influence on Malaysia's manufacturing industries because all economic activity was interrupted for a considerable period. Implementing eco-innovation capabilities is viewed as one of the key approaches that firms can decide to adapt in order to sustain their local and global competition during this unexpected pandemic. In this study, we examine the potential significant eco-innovation capabilities that manufacturing companies implemented during the pandemic. This study applies the qualitative method by interviewing four top-level managers of small and medium-sized enterprises (SMEs) in Malaysia. The essential components of eco-innovation capabilities represented in this study are product, process, organisation, marketing, and technology. The results demonstrate that the majority of SMEs in Malaysia were able to employ core eco-innovation capabilities for their operations during the pandemic. However, for various reasons, a minority of SMEs were unable to implement any of the capabilities in their daily operations. This study has important implications for policies, government institutions, and manufacturer business managers in terms of developing an effective innovation platform upon which manufacturing businesses can rely to increase their business potential and performance in the coming years and beyond.

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Introduction

In the 21st century, climate change and increasing human demand for natural resources have emerged as major concerns for local and global economies. A growing number of people are realising the benefits and importance of environmental sustainability, which has significantly contributed to the current state of the global crisis. Such awareness could eventually lead to sustainable solutions through innovative approaches (Carrillo-Hermosilla et al., 2010; Hojnik & Ruzzier, 2016). Successful businesses have worked hard to adapt to the obstacles and exploit the opportunities presented by sustainability practises. Cooperation and partnership between the local government agencies, stakeholders, investors, and the manufacturing company may help them obtain specific benefits in securing environmental sustainability goals and increasing performance efficiency (Ji et al., 2020).

The direction of economic growth has been significantly impacted by the coronavirus disease (COVID-19). The Department of Statistics Malaysia claims that numerous businesses, particularly in the manufacturing sector, were negatively impacted by the movement control order (MCO) that was implemented in Malaysia on March 18, 2020. The biggest problem for SMEs was that in the wake of the pandemic, they had to consider numerous factors, especially related to their financial condition and the availability of their resources. SMEs were also battling to secure their daily operations, manage their financial situations, and maintain local and global competitiveness. SMEs were greatly affected by the presence of this pandemic because they had to keep on paying their utilities, workers, suppliers, and so on.

According to the Organisation for Economic Co-operation and Development, SMEs, together with other sectors and services, are represented in both local and global economies and account for more than 50 percent of the nation's gross domestic product (Organisation for Economic Co-operation and Development [OECD], 2021). Consequently, businesses must actively adapt to the problems of the current scenario by utilising and developing their own initiatives such creative marketing strategy or any innovative practices rather than solely relying on government incentives (Ch'ng et al., 2021; Hasin et al., 2021). Assessing a the company's ability to minimise the long-term risk that comes with resource pollution and waste management is vital to measuring the overall status of both economic and environmental sustainability (Pichlak & Szromek, 2021). Due to the significant

financial commitment required, environmental sustainability may be viewed as a burden on businesses. Malaysian SMEs have had a difficult time dealing with climate change and environmental issues, due to a lack of support from suppliers or stakeholders as a result of being affected by the pandemic as well, as several economic sectors were closed down for nearly two years (Zulkiffi et al., 2022). In order to recover, SMEs need to develop unique and new skills, such as applying eco-innovation capabilities in their manufacturing processes, which can lessen the environmental impacts of those processes.

Implementing eco-innovation, which places an emphasis on environmental sustainability, may make it easier for SMEs to compete with big companies in the same sector. Eco-innovation is described as any innovation activity in a product, process, organisation, or technology that attempts to lessen negative environmental effects. SMEs can incorporate eco-innovation into their business plans so that companies would be able to transform environmental constraints into opportunities to improve their financial status and reputation in the existing or emerging market (Loučanová et al., 2021). Budgeting is an essential tool for Malaysian SMEs, particularly in the face of this kind of pandemic, since poor financial management could push a company towards closure and insolvency.

Collaboration with research and development (R&D) institutions is necessary for SMEs in order to adopt eco-innovation at a lower cost (Araújo & Franco, 2021). Developing new ideas, data, and plans for existing or new products refers to the advantages that businesses can gain from collaboration. Through external collaboration partners as a source of knowledge, it is possible to overcome the shortage of resources and expertise, which are not internally accessible but are required for eco-innovation (Kobarg et al., 2020). Customer suggestions and complaints are another reason why SMEs invest in R&D for their products. Previous studies have identified that eco-innovation is a strategy that directly reduces the environmental effects of manufacturing while also assisting companies in enhancing their relationships with their clients on both the local and international markets (Costantini et al., 2017; Fernando et al., 2021). Innovation of new or current products contributes significantly to reducing waste production and minimising pollution during daily operations (Yurdakul & Kazan, 2020).

This research is focused on the eco-innovation capabilities implemented by Malaysian SMEs in the manufacturing sector as a business plan to achieve

environmentally sustainable business growth, even though they experienced some effects from the COVID-19 pandemic. Previous studies have found that SMEs can considerably adapt these five eco-innovation capabilities to boost their business performance in the face of unexpectedly challenging global conditions (Liao & Tsai, 2019; Pacheco et al., 2017; Yao et al., 2019). However, this study's findings also show that not every SME in Malaysia can adopt eco-innovation capabilities due to business suitability, financial constraints, management capabilities, skills, and knowledge levels. The purpose of this research is to investigate the eco-innovation capabilities of Malaysian SMEs that are capable of being adopted in the wake of the COVID-19 pandemic.

Literature Review

Eco-innovation Capabilities

Manufacturing companies can immediately apply new business innovation challenges and opportunities to their operations following the creation of the disease. To ensure their survival in the face of societal growth, SME financiers must consider investing in both innovative and sustainable business strategies. Changes to a company's organisational and managerial structures are required since eco-innovation is essential for enhancing internal and external environmental management performance (Burki et al., 2019). In order to preserve the long-term stability and viability of the manufacturing industry during the pandemic, entrepreneurs play a crucial role in the decision-making process. They must be aware of the company's resources and assets to prevent wasting time, money, and raw materials that might be used for another appropriate activity that would support business in the market (Sund et al., 2016).

Today's society is more engaged with environmentally friendly products. Therefore, SMEs must use this chance to implement eco-product innovation that has been proven to minimise environmental impact and be safe for use by both local and international clients (Maldonado-Guzmán & Garza-Reyes, 2020). Businesses that engage in eco-product innovation may see this as an opportunity and potential source of revenue (Yao et al., 2019). The contribution of eco-product innovation that aims to minimise waste and increase a firm's value by focusing on the sustainability issue is a reduction in the use of raw materials and the use of existing materials.

This research proves that eco-product innovation not only helps to minimise environmental risk but also increases social development among manufacturing businesses during the pandemic COVID-19.

Environmentally friendly products can be produced by businesses with the help of eco-process innovation. Typically, technological developments and the emergence of eco-product innovation within an organisation go hand in hand with process innovations. Along with improving the efficiency of eco-product innovation, eco-process innovation can lower the cost of the manufacturing process. Manufacturers have also concentrated on enhancing eco-process innovation to ensure the best possible use of the organisation's internal resources and reduce waste and pollution in the production processes (Negny et al., 2012). Therefore, this research shows that this eco-innovation capability has the potential for a sustainable environment due to the way the manufacturing process aims to curb pollution or waste material.

Without a stellar group of people working together, an organisation cannot produce a great idea of an innovation for their businesses. According to Rodriguez et al. (2021), eco-organisational innovation is defined as a new organisational structure with different ideas and strategies towards being environmentally sustainable during the daily operations. An entrepreneur should understand how to employ existing or new resources in the organisation before embarking on the development of innovation activity (Zameer et al., 2020). This study aims to demonstrate the direct relationship between eco-organisational innovation and environmental contribution while incorporating an environmental-focused business strategy throughout the pandemic.

Methods that can convince consumers to buy their product and attract internal and external investors are a priority for the business sector nowadays on a local and global scale. Many business owners in the manufacturing sector choose to invest in eco-marketing innovation in order to achieve optimal business performance while sustaining awareness of the green environment (Katsikeas et al., 2016). The modifications in price strategy, product design, packaging, and promotion contribute towards sustainability, which is also responsible for the positive association between eco-marketing innovation and a firm's sustainability. Disorganised supply chains, difficulties in cash flow, cancellation of orders, and reduced customer purchasing power are also among the challenges faced by the manufacturing sector during the pandemic (Turner & Akinremi, 2020). This study proved that eco-marketing was implemented by Malaysian

SMEs in order to preserve the environment by using the best method to attract clients to consume their product.

Sales in 2020 declined by more than 20 percent compared to 2019 due to customers delaying payments and cancellation of orders from retailer or supplier (Vaghefi & Jo-yee, 2021). Apart from these issues, innovation activity can be boosted by developing a new technology which can modify and improve any eco-product or eco-process. Before proceeding with these innovations, entrepreneurs need to understand the ability of their company to identify the appropriate technologies they need to avoid wastage of resources, especially in the financial aspect (Diaconu, 2011). Investments in eco-technology innovation in this study indicate how SMEs will improve the efficiency of the production process and save production time, while also ensuring the health and safety of operational staff.

Methodology

Data Collection

To address the research questions, this study was conducted qualitatively through interviews. Data were collected from the participants using an online interview. The information letter, which included the details of the study, guidelines, and how to achieve the research objectives, was explained to the participants before the interview was held. Semi-structured interviews were adopted to collect the data, which allowed the researcher to communicate better with the participants, including those who wanted a reasonable space to express their opinions and thoughts about the topic. In a semi-structured interview, if the participants do not understand or find the questions unclear, they can directly ask the researcher for further clarification. This is intended to reduce uncertainty among the participants and allow the researcher to get an in-depth understanding of the participant's responses.

The main criterion for selecting the participants in the study was the top management of Malaysian SMEs. According to a study by Baker and Edwards (2013), there is no correct answer to the question of how many participants should be contacted or interviews that should be conducted for a qualitative study because it depends on the goal of the study and how crucial the question is to it. Ten participants were initially expected for this study, but due to their busy schedules, six of them abruptly

withdrew. Some participants said that they were in a severe situation as a result of the lack of staff during the pandemic. It was mentioned during the phone call to confirm their presence for the interview.

Participants were contacted through email and telephone to explain the details of the research. The researcher emailed an invitation letter to the participants to schedule the interview session. Each interview session was conducted in Malay and English based on the participant's preference. The interview took approximately 30 to 45 minutes. Interviews were recorded with the consent of all participants, then transcribed and analysed. Snowball sampling is used in this study to increase the number of participants. This is because the study discovered a shortage of volunteers after receiving repeated rejections from them. The fact that the interviewee provided the name of at least one potential participant helped the researchers schedule the next interview to continue the study. However, the majority of the reachable participants were unable to participate in the study for the reasons listed.

A study by Tremblay et al. (2021) found that people may refuse to participate in the research despite their genuine interest in the topic because of several factors, such as time constraints and physical distance that have a direct impact on people's and businesses' lives. As a result, the current study's participants and data source were limited to just four individuals. There was also a prior study that used thematic analysis to verify the data of four participants, which supports the findings of this research (Luca & Andreou, 2019).

In the process of collecting qualitative data, it is crucial for researchers to determine whether sufficient data have been collected. According to Fusch et al. (2018), the achievement of research objectives depends on the data reaching the saturation point. The validity of the findings in this qualitative study depends heavily on the data collected, provided by the participants who answered all the research questions (Hennink & Kaiser, 2022). Therefore, this study employs a qualitative methodology to examine the eco-innovation capabilities implemented among four SMEs in Malaysia, which is sufficient due to the difficulties that were stated above. The finding of the study was that the data collected from four participants were saturated with relevant information regarding the research questions. The data involve coding that allows the researcher to identify the themes, and it continues until saturation is reached (Mwita, 2022).

Data Analysis and Discussion

In this qualitative study, the data were analysed using thematic analysis. Thematic analysis is defined as a method for analysing, identifying, and describing the data from the study based on personal insight (Vaismoradi & Snelgrove, 2019). The researcher analysed the data in a few steps, starting with translating the transcripts from the Malay language into English. Next, the transcripts were reviewed by reading them multiple times to identify potential themes and understand the keywords for the next step, which is creating coding frames by naming the themes according to the research questions. The data were classified based on the eco-innovation capabilities implemented by Malaysian SMEs before proceeding with the research's final report. Four top-level managers of Malaysian SMEs were involved in this study. Regarding the participants' backgrounds, they were classified in terms of the size of the business by the number of their employees. [Table 1](#) shows the profiles of the participants from SMEs that fully participated in the interview.

The data were gathered from the participants, who shared their experiences about their respective companies. The races of those who participated in this interview were Chinese (P3) and Malay (P1, P2, and P4). Among these four participants, two were from small enterprises, and two were from medium-sized enterprises. A small-sized enterprise consists of 5 or more employees, but not more than 75; meanwhile, a medium-sized enterprise consists of 75 or more employees, but not more than 200.

Participants responded to questions detailing, "What eco-innovation capabilities are employed by the manufacturing SMEs in Malaysia?" and, "What is the impact of the COVID-19 pandemic on SMEs in Malaysia?" Despite this pandemic circumstance, SMEs could still survive in the business sector. The companies encountered some negative effects stemming from this situation and converted these issues into an opportunity for them to compete with others during this pandemic. They also stated that their companies were operable

during the post-pandemic phase due to the manufacturing of existing and new products. These choices can assist SMEs in improving their sales performance and preventing insolvency or permanently closing.

From the interview session, the researchers found that not all the participants were able to adapt eco-product innovation, eco-process innovation, eco-organisation innovation, eco-marketing innovation, and eco-technology innovation within their organisation. Therefore, eco-process innovation, eco-organisational innovation, and eco-marketing innovation were employed by three participants (P1, P3, and P4), while two participants (P1 and P4) employed eco-product innovation and eco-technology innovation. However, one of the participants did not implement any of the eco-innovation capabilities as the business lacked the capability to adapt innovation for the business. According to the study participants' explanations, these five eco-innovation capabilities may be the most important factor for Malaysian SMEs to sustain their businesses during the COVID-19 pandemic.

The Implementation of Eco-Product Innovation within the Organisation

One of the participants declared that they were practicing eco-product innovation by creating new products for the company using materials that were already in supply. Since the pandemic, the innovation of green products has been done virtually daily, as it has become one of the participants' key business operations.

The above response ([Table 2](#)) suggests that Malaysian SMEs are applying their existing materials to produce their new product. The unique skills and strategy enhance SMEs' ability to sustain the environmental condition due to the specialists in the business that can convert the rotten one into a new one. Because society is aware of a firm's expertise with the product, this practice can ensure the business's survival, especially during this unexpected circumstance. Reducing the use of raw materials and

Table 1 Profile of participants from SMEs in the study

Participant	Position	Number of Employees	Size of the Firm	States	Production	Post- pandemic Business
P1	Founder	150	Medium	Terengganu	Medical and Care	Operable
P2	Founder	12	Small	Kelantan	Textile	Operable
P3	Founder	40	Small	Selangor	Toiletries and Cosmetics Product	Operable
P4	Sales & Shipment Manager	200	Medium	Sabah	Furniture	Operable

using renewable resources are part of efforts to protect the environment in addition to delivering the effectiveness of eco-product innovation in the business world. The implementation of this practice is linked to a company’s desire to reduce the overall impact of its production on the environment. A previous study, which discovered that existing material practices and applying clean and lower usage of raw materials can also be classified as eco-innovations that can help the manufacturing industry, also provides support for the current finding (Toha et al., 2020).

The Implementation of Eco-Process Innovation Capability within the Organisation

Participants’ responses indicated that they were more responsible in their production process, particularly in terms of the green approach. They made the decision to alter their production process in response to COVID-19 in order to satisfy local and international investors’ preferences. The manufacturer concentrated on applying eco-process innovation to ensure the least amount of

waste and upgrade the better-quality of the production (Dahan et al., 2017). Table 3 shows some evidence of this in the explanation by the participants during the interview sessions.

The outcome demonstrates that the entrepreneurs made the decision to modify or innovate their processes in order to preserve production efficiency and product quality. The plan developed by the SMEs that participated in this study can be seen as a strategy for creating a connection with eco-innovation that will be valuable for both economic and business development (Peyravi & Jakubavičius, 2022). In this study, the factors that positively influence the growth of eco-process innovation include producing the least amount of waste, using fewer chemicals, and increasing R&D investment. These contributions will increase eco-friendly effectiveness and encourage corporate policies towards environmental sustainability (Xu et al., 2020). These findings have been verified by the previous research (Ianni et al., 2020), showing that innovation in processes enhances a continuously sustainable firm’s value.

Table 2 Response from participants on the implementation of eco-product innovation

Significant Statement	Code	Theme
“Since our raw materials are chemical substances, we ordered the <i>better and less risky ones</i> from the supplier, who then converts them into our end product. Chemicals can have a negative impact on the environment, however, our product employs the <i>highest-quality plastic</i> currently offered that <i>can be recycled after being used by a client.</i> ” (Participant 1).	- Better and less risky - Can be recycled	- Clean use of raw material
“We have used our product to the fullest extent possible since the pandemic. Instead of throwing away old mattresses and furniture, we <i>collect them and create brand-new ones</i> out of them. We have a special <i>method for converting a defective product into a new one</i> that our customers can use safely and pleasantly.” (Participant 4).	- Collect and create brand-new - Special method for converting	- Existing product

Table 3 Response from participants on the implementation of eco-process innovation

Significant Statement	Code	Theme
“In terms of the process, we actually spent more on <i>research and development</i> for our product to make sure <i>it was safe for our clients to use</i> . It would appear that we have a duty to do research on our product in order to <i>increase its productivity</i> , somewhat like our clients from the medical institute.” (Participant 1).	- Research and Development - Safe to use	- Procedure
“Due to the COVID-19 pande, we received a lot of <i>complaints and comments</i> from customers concerning our product. So, we made the decision to <i>evaluate our ingredients</i> in order to create and add anti-bacterial elements into our main product.” (Participant 3).	- Suggestion - Evaluate the ingredients	- Strategy
“We changed our production process as a result of our decision to accept the rotten product so that we <i>could recycle it</i> . Solid waste can be avoided, and I think that doing so is safe for the ecosystem and its surroundings.” (Participant 4).	- Recycle	- Strategy

The Implementation of Eco-Organisation Innovation within the Organisation

To develop or reorganise the company plan or strategy with consideration for an environmentally sustainable organisation, a solid relationship between all levels of departments is required. The participants claimed to have positive working relationships with all their coworkers because they engaged in positive behaviors like forgiveness, tolerance, openness, and teamwork. According to García-Marco et al. (2020), there are several eco-organisational innovation practices that connect to decision-making, leadership support, and orientation for innovative activity as the main management to meet environmental goals. Table 4 shows the explanations from three of the participants.

The actions of the organisation, as demonstrated by the participants above, play a significant part in ensuring that the staff members can contribute to the growth of eco-organisational innovation within their businesses. To ensure that the firm could continue its regular operations, top-level management was responsible for restoring and rebalancing the organisational structure that had been impacted by the pandemic. It is crucial to bring awareness to organisational innovation since it can save internal resources, such as energy usage and inner workings, while developing green innovation (Bitencourt et al., 2020). Participants in this study have applied eco-organisational innovation, which comprises adjustments to management

practices, workplace culture, and decision-making to satisfy customer preferences in an effort to reduce environmental impact and increase sustainability (Hazarika & Zhang, 2019; Rajala et al., 2016).

The Implementation of Eco-Marketing Innovation within the Organisation

Manufacturing SMEs have given eco-marketing innovation a lot of consideration and interest in order to maintain their business operation especially during this pandemic. In other word, it reflects the opportunities of consumer's awareness about the existing of green product manufactured by the firm. Most companies use a strong brand image to highlight the benefits that their products have on the environment and consumer comfort while using it (Biscione et al., 2022). The responses from the participants provide a summary of these findings, as shown in Table 5.

Due to the pandemic, social media was the best tool they could use to interact with their clients, and the power of word-of-mouth also played a role with the same aims. According to Wursan et al. (2021), the decision to purchase a green product is positively influenced by word-of-mouth, which also has a significant impact on business performance. Due to the pandemic, the finding showed that there have been adjustments made to price strategy, production planning, promotion, and packaging that realign the value delivered to customers (Toha et al., 2020).

Table 4 Response from participants on the implementation of eco-organisation innovation

Significant Statement	Code	Theme
<p>“The <i>motivation</i> of my team members is a top priority for me as the company's leader because I want to make sure that they are constantly thinking about sustainability and green living during the operational process. We <i>discuss</i> about the management state of our raw materials, liquid and solid waste from chemical usage, and any other hazardous materials in our company during our <i>weekly meeting</i>.”</p> <p>(Participant 1).</p>	<ul style="list-style-type: none"> - Motivation - Discussion - Weekly meeting 	<ul style="list-style-type: none"> - Teamwork
<p>“Since COVID-19, our <i>regular monthly gathering</i> is a must. We made the choice to innovate our product and process due to the <i>ideas we collected</i> from the customer's complaints and suggestions. To make sure that our organisation is always on the correct track in terms of environmental protection while producing products, it is essential to have an <i>excellent organisational chart</i> that continuously serves as a reminder of the significance of sustainability in every operation.”</p> <p>(Participant 3).</p>	<ul style="list-style-type: none"> - Gathering - Organisational chart 	<ul style="list-style-type: none"> - Openness
<p>“Since the COVID-19 outbreak, managers usually <i>keep a careful eye</i> on how their <i>staff members handle and manage</i> raw materials and solid waste. In order for the waste collector to come and collect our trash without any issues, we must ensure that it is kept in one precise location. The solid waste may cause injuries to our coworkers if we do not manage it well and effectively.”</p> <p>(Participant 4).</p>	<ul style="list-style-type: none"> - Supervise - Employee participation 	<ul style="list-style-type: none"> - Teamwork

Table 5 Response from participants on the implementation of eco-marketing innovation

Significant Statement	Code	Theme
<p>“We use <i>digital marketing</i> as a technique to advertise our product. We also have our <i>own brand name</i>, and we <i>modify our packaging</i> in order to increase its sustainability with regard to the natural world and the environment. Whenever possible, we only use recyclable boxes.”</p> <p>(Participant 1).</p>	<ul style="list-style-type: none"> - Social media - Brand name - Packaging 	<ul style="list-style-type: none"> - 4Ps - Technique
<p>“Our primary marketing approach relies on the influence of <i>word-of-mouth</i>. Due to the fact that most people will throw flyers and pamphlets away, we decided not to use them. Actually, we put the <i>green label</i> and <i>anti-bacterial label</i> on our core product after implementing innovative practices towards it. We have our own brand name and are well-known in the community.”</p> <p>(Participant 3).</p>	<ul style="list-style-type: none"> - Word-of-mouth - Labelling - Brand name 	<ul style="list-style-type: none"> - Technique
<p>“Due to the fact that our company is based in Sabah, our coverage was constrained. We still rely on the effectiveness of <i>word-of-mouth</i> marketing as we still lack experience in social media. Regarding to <i>price</i>, if the furniture was customised, our <i>pricing range</i> would be slightly higher, but most of it would still be competitively priced.”</p> <p>(Participant 4).</p>	<ul style="list-style-type: none"> - Word-of-mouth - Pricing 	<ul style="list-style-type: none"> - 4Ps - Technique

A well-known brand recognition encourages stakeholders to spend more on the environmental friendliness of their products. The study’s findings regarded eco-marketing innovation as a significant factor in achieving firm sustainability in this context and will serve as a guide for SMEs in the future and beyond.

The Implementation of Eco-Technology Innovation within the Organisation

Technology has a significant impact on economic output efficiency, resource utilisation effectiveness, and environmental conditions. The study’s participants, as shown in Table 6, claimed that they provided eco-technology innovation with the intention of improving their production process and completing it in the allotted period. Sanni (2018) described how eco-technology innovation showed how internal physical resources and skills eventually

influenced the goals of a firm’s sustainability performance. Due to the ongoing advancement of technology, firms must take action to address the problem in order to protect both their businesses and the environment.

The participants reported employing eco-technology innovation to provide information in material planning as well as guidance to produce the best eco-friendly product for the business. This eco-technology innovation is critical to the success and efficiency of eco-product and process innovations. The study’s findings revealed that using eco-technology in the firm helps SMEs with production process efficiency, employee health and safety, controlled energy usage, and reducing global warming. Several studies have agreed that the finding of the study correlated with the adoption of those practices of technological innovation (Azmi et al., 2017). This eco-innovation competence can contribute to better environmental sustainability and a decrease in both local and global greenhouse gases (Bilal et al., 2022; Sukri et al., 2023).

Table 6 Response from participants on the implementation of eco-technology innovation

Significant Statement	Code	Theme
<p>“Since we made our product from chemical materials, the <i>machine</i> that we used had to <i>follow all the chemical guidelines</i> specified by the Malaysian Minister of Health. It is to ensure <i>the safety</i> of our core clients, medical institutions. We make further investments in innovation and technology to sustain our business and serve our clients in the best way possible.”</p> <p>(Participant 1).</p>	<ul style="list-style-type: none"> - Machine - Guidelines - Protection 	<ul style="list-style-type: none"> - Equipment - Safety
<p>“We are starting our journey using outdated technology because we were not able to previously. To ensure that our workers <i>could use them securely</i> and keep producing high-quality goods, we were able to purchase some unusual and <i>contemporary machines</i>, such as a wood cutting machine. <i>Injuries</i> may occur if they do not employ it carefully. There was a worker who was killed while using the old machine. So, the new machine utilised <i>lower voltage levels</i>, which resulted in <i>decreased utility costs</i>.”</p> <p>(Participant 4).</p>	<ul style="list-style-type: none"> - Machine - Injuries - Voltage - Utility cost 	<ul style="list-style-type: none"> - Equipment - Safety - Usage

The Impact of the Pandemic on Malaysian Small and Medium Enterprises

The coronavirus pandemic urged the researcher to observe more about the impacts on the SMEs' management due to the various changes in the manufacturing sector. Therefore, after exploring the answers and explanations given by the participants (see Table 7), the study concludes that SMEs in Malaysia experienced the effects of this pandemic, but they could still manage and survive in this challenging market industry. Based on the participant's descriptions, they have relied on the power of their product, along with the contributions of their loyal customers, suppliers, and stakeholders.

In summary, the finding shows that the participants tried their best to ensure that their organisation can keep going and survive in the market industry by pursuing everything they can along with the various difficulties they need to face. Work procedures and management were well organised by the participants to overcome the challenges, especially in terms of finances. One of the most important aspects that manufacturing companies must maintain in order to remain competitive and guarantee a considerable amount of time in the market is financial stability. SMEs can produce a large volume of goods and effectively manage their finances, which is

why they experience fewer problems than other types of businesses. However, along with the difficulties, SMEs still managed to survive and recover from them. These findings are supported by recent literature, arguing that manufacturers are refining their production schedules and risk management plans to operate efficiently, and working with their logistics partners is the best way to pursue desirable economic, social, and safety performance goals (Nader et al., 2022).

Conclusion and Recommendation

Based on the participants' feedback, SMEs have been capable of enduring the COVID-19 pandemic and staying in business. The novelty of the study is that the minority of SMEs did not implement any eco-innovation capabilities, but they still managed to survive and secure their businesses in the COVID-19 pandemic. This study demonstrates that not every business requires eco-innovation in order to survive. This is based on the type of businesses being suitable for adopting the eco-innovation practices. They can also ensure environmental sustainability without applying any eco-innovation capability, as they did not manufacture a harmful product that enhanced pollution in local and global economic environments.

Table 7 Response from participants on the implementation of innovation during the pandemic

Significant Statement	Code	Theme
<p>"Since our product is classified as an essential good, we can continue to conduct business as usual during the pandemic. Nonetheless, the <i>pandemic had an impact</i> on our business, such as supplier <i>cancellations</i>, a lack of <i>resources</i>, and a <i>reduction</i> in the level of production process. We still need a plan to recover from the problems in the long run."</p> <p>(Participant 1).</p>	<ul style="list-style-type: none"> - Cancellation - Resources - Production 	- Difficulty
<p>"Actually, we want to express our gratitude to our customers because, without them, our company would not have reached this point. However, this pandemic has caused our business to <i>shut down</i> our premises for a while, and we have had <i>low power purchases</i> from our customer. We still need to <i>pay our monthly utility</i> bills even though our premise is closed. It increased our <i>business losses</i> during the pandemic."</p> <p>(Participant 2).</p>	<ul style="list-style-type: none"> - Shut down - Utility - Losses 	- Difficulty
<p>"It would be a lie to say that the pandemic had no effect on our business. We are <i>close to needing to permanently close</i> this business due to <i>the budgeting issue</i>, but we still manage to deal with this problem because of the support from our suppliers. The most important aspect that has affected us is <i>financial</i> because we cannot do anything without money."</p> <p>(Participant 3).</p>	<ul style="list-style-type: none"> - Bankruptcy - Budgeting 	- Difficulty
<p>"For me, I think our company is still in good shape. We can still survive during this pandemic because there are many quarantine centers that need beds and mattresses. So we recover the <i>budgeting loss</i> from the pandemic with the bookings and orders from the government agencies to the quarantine centers."</p> <p>(Participant 4).</p>	<ul style="list-style-type: none"> - Budgeting 	- Recover

Therefore, the majority of SMEs also continue adapting their eco-innovation practices to compete against their competitors by fulfilling society's preference for eco-friendly products. Findings of the study showed that the majority of Malaysian SMEs were capable of adapting eco-process innovation, eco-organisational innovation, and eco-marketing innovation. However, there are businesses that are capable of implementing eco-product innovation and eco-technology innovation, focusing on the suitable products manufactured and the availability of budgeting in order to utilise new equipment in the firm. Eco-innovation capabilities have a unique relationship, in which they rely on one another in order to sustain the SMEs' business performance (Ch'ng et al., 2021).

Furthermore, this study suggests that eco-process, eco-organisation innovation, and eco-marketing are the most noteworthy and outstanding factors for SMES that can assist them in surviving the COVID-19 pandemic. This capability guides SMEs because it enables them to obtain financial support for successful environmental sustainability. Although the current study has discovered findings regarding the relationship between eco-innovation and SMEs, it also suffers from certain limitations. The movement control order affected the data collection activity when reaching out to the participants because the majority of them had refused to participate in the study during this pandemic phase. Additionally, the interviews were conducted entirely online using the online platform. There was an issue with the internet connection during the interview session, which was overcome by re-asking the questions between the researcher and the participants.

Manufacturing businesses should pay greater attention to the changing environment and transform the challenges into an opportunity to engage more customers and sustain the business performance of the organisation. SMEs also need to increase their collaboration with suppliers or related government agencies in developing eco-innovation capabilities to ensure the innovation will be more easily and effectively adopted. These efforts could potentially enable SMEs in Malaysia to gain more opportunities to survive in these challenging times and in unexpected circumstances in the future. This study has determined that the majority of SMEs in Malaysia accomplished eco-innovation capabilities during this pandemic, along with improving their business plans, marketing strategies, and financial management.

Conflict of Interest

The authors declare that there is no conflict of interest.

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