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Design and develop an online digital marketing course to enhance Thai manufacturing MSME's digital marketing capabilities

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Abstract: This study aims to: (1) analyze the need for digital marketing capabilities in Thai MSME; (2) develop an online digital marketing course; and (3) enhance Thai MSME's digital marketing capabilities, particularly in Thailand's manufacturing sectors. The survey was conducted using questionnaires distributed to a sample group of 400 digital marketing staff, executives, or business owners, complemented by in-depth interviews with marketing experts, business managers, and owners, totaling 10 participants. The research findings reveal a significant demand for digital marketing skills among MSME entrepreneurs in the manufacturing sector. The top three skills identified as most crucial for enhancement are: (1) communication and marketing information presentation skills; (2) brand building and public relations; and (3) video marketing execution. The study further revealed that the design of the digital marketing course, along with the developed online learning platform, attracted and successfully enrolled 104 MSMEs who participated in the online program. The pre- and post-training assessment results demonstrated a statistically significant difference in test scores, with a mean post-training score of 16.10 (\bar{X} Mean = 16.10, S.D. = 1.396), representing a notable increase from the pre-training mean score of 6.47 (\bar{X} Mean = 6.47, S.D. = 3.634) at the 0.05 significance level. Furthermore, the results of the follow-up evaluation on the application of acquired knowledge revealed that the overall level of knowledge and skills application is at its highest, with an average score of 4.64. This indicates that the developed course and online learning platform effectively enhance learners' knowledge.

Keywords: digital marketing; skills; micro; small and medium enterprises; manufacturing sector; online course

1. Introduction

Technological advancements have profoundly transformed the lives of Thailand's citizens and the broader business landscape, particularly offering substantial benefits to marginalized groups. This transformation is emblematic of a wider regional trend within ASEAN, with projections indicating that the digital economy will reach a staggering USD 2 trillion by 2025, a testament to the rapid growth of internet usage across the region (Ikumo and Hilmy, 2023). Propelled by its ambitious Thailand 4.0 policy, Thailand is actively pursuing a digital revolution that is comprehensively reshaping processes and transactions across nearly all industries, positioning its digital economy as the second largest within ASEAN (Intaratat, 2021).

However, the advent of the COVID-19 pandemic has introduced significant challenges, particularly affecting small and medium-sized enterprises (SMEs), with the global health crisis negatively impacting the global Gross Domestic Product (GDP) and international trade, leading to a pronounced slowdown in Thailand's economic

growth; projections for 2021 suggested a more subdued expansion for MSMEs, with growth rates falling below earlier estimates despite slight increases in sector-specific GDPs such as manufacturing and retail, underscoring the crucial role of MSMEs in the Thai economy and highlighting the necessity for adaptability amidst rapidly evolving technologies that threaten traditional business models (Potjanajaruwit, 2023; The Office of SMEs Promotion, 2021). In response to these technological and economic pressures, Thai businesses are increasingly embracing digital strategies to maintain competitiveness, with the rapid adoption of digital tools proving essential for survival. Concurrently, the government has been implementing policies aimed at bolstering digital skills among MSMEs and enhancing their access to both domestic and international markets through e-commerce platforms, efforts that are vital for enabling Thai businesses to navigate the complexities of the modern digital marketplace and to leverage digital marketing for sustainable growth (Secretariat of the Cabinet, 2021). Furthermore, due to increased competition, there is a growing need for MSMEs, especially those in manufacturing, to improve their operational performance and efficiency. Research indicates that the implementation of digital marketing strategies is crucial for these businesses to expand their customer base and remain competitive in a global market that is increasingly influenced by e-commerce. This trend requires a proactive approach to adapting to digital technologies (Tongdaeng and Mahakanjana, 2022).

Finally, the global shift towards digitalization, accelerated by the COVID-19 pandemic, has underscored the importance of digital technologies for MSMEs, with the adoption of online platforms, targeted advertising, and data analytics enabling these businesses to enhance their understanding of market trends and consumer preferences, thus positioning themselves effectively in a rapidly changing business environment and preparing for future challenges and opportunities in the evolving digital economy (World Bank, 2021). The research primarily aims to enhance the digital marketing capabilities of Thai MSMEs, particularly in the manufacturing sector. To achieve this, the study has laid out a structured approach with three main objectives:

- **Analyze the Need for Digital Marketing Skills:** This involves assessing the current digital marketing capabilities and identifying the specific skills that are lacking within Thai MSMEs in the manufacturing sector.
- **Develop an Online Digital Marketing Course:** The research aims to design and implement a specialized online course that addresses the identified digital marketing skill gaps. The aim of this course is to equip MSME entrepreneurs and their employees with the essential tools and knowledge to enhance their digital marketing practices.
- **Enhance Digital Marketing Capabilities:** The research's ultimate goal is to improve these businesses' digital marketing capabilities. By improving these skills, the research seeks to empower MSMEs to better compete in the digital marketplace, thus contributing to their growth and sustainability in the digital economy.

This structured approach not only addresses the immediate educational needs but also seeks to provide a sustainable improvement in the digital marketing proficiency of Thai MSMEs, thereby supporting their growth and adaptation in a rapidly evolving

digital landscape.

2. Literature review

2.1. Digital economy

The digital economy encompasses the increasing importance of information and knowledge in economic activities, with e-commerce being a significant component (Øverby and Audestad, 2021). It heavily relies on information and communication technology (ICT) developments, shaping some of the world's largest companies (Singh, 2004). Trillion-dollar companies in this economy benefit from human emotions, relationships, and interactions, focusing on creating communities read by algorithms for profit extraction through targeted advertising and subscriptions. The digital economy's growth impacts various sectors, influencing business strategies, intellectual property rights, contracts, and government policies related to privacy, antitrust, and international trade. The digital economy's growth has a significant impact on GDP and MSMEs. Driven by new ideas and technological progress, the digital economy reduces transaction costs for marketing and advertising, leading to additional GDP growth in countries and potential growth in sectors like agricultural production in Russia (Zhukov, 2022). Furthermore, the digital economy enhances the performance of MSMEs by providing alternative financing options, improving productivity, profitability, and overall trade growth in countries like India (Setyoko, 2023). However, challenges such as technical gaps and limited internet access hinder some MSMEs from fully benefiting from digitalization, impacting their incomes and leading to layoffs (Maiti and Kayal, 2017). Overall, the digital economy's growth positively influences GDP through reduced costs and boosts MSMEs by enhancing their operations and financial access.

2.2. Micro, small and medium-sized enterprises (MSMEs)

As per the announcement of Thai ministerial rules, the definition of MSMEs is micro, small, and medium-sized enterprises. The characteristics of micro, small, and medium-sized businesses were classified by considering the number of employees and income. Moreover, the MSMEs sector in Thailand is classified into three business sectors, which include the manufacturing, service, retail, and wholesale sectors. This research focuses on the manufacturing sector. The manufacturing sector covers the characteristics of all types of industrial operations. Manufacturing can be broadly defined as the process of using chemicals or machines to turn raw materials into new goods, whether labor is performed by hand or not. This includes the straightforward processing of industrial agricultural products, community enterprise production, and household industry production. (The Office of SMEs Promotion, 2021).

In the manufacturing sector, the following details explain the size of a business:

- A micro-sized enterprise is defined as having fewer than five employees or earning less than eight million baht. For example, a local artisan workshop shop employing three artisans with an annual income of 800,000 baht or a small-scale farming operation with two workers generating 300,000 baht in annual revenue would all fall into the micro-enterprise category.

- A small-sized enterprise is defined as having fewer than 50 employees or an income of less than 100 million baht. For instance, a diminutive manufacturing facility employing 25 individuals and yielding annual sales of 50 million baht would be categorized as a small-scale firm.
- A medium-sized enterprise is defined as having fewer than 200 employees or earning less than 500 million baht. For example, a medium-scale industrial plant with 190 workers and an annual revenue of 200 million baht would fall into the medium-sized enterprise category.

MSMEs face difficulties in adopting digital marketing due to a variety of factors. Limited resources, budget constraints, restricted market access, competition with larger companies, and understanding target audiences hinder their digital marketing efforts (Antonio-Vidaña et al., 2022). Financial limitations, inadequate technology infrastructure, cyber security issues, and a lack of digital marketing knowledge are significant concerns for MSMEs with low to moderate digital marketing adoption levels (Yong, 2023). The COVID-19 pandemic has intensified the need for digital marketing adoption among MSMEs, with many utilizing it not only for marketing products but also for communication, information dissemination, and transaction convenience. Despite the importance of digital marketing, some MSMEs still struggle with implementing it effectively, resorting to basic platforms like Facebook, WhatsApp, Instagram, and TikTok while lacking e-commerce utilization due to system unfamiliarity (Ayundyayasti et al., 2023).

2.3. Digital marketing

Digital marketing is the practice of promoting goods and services, reaching target consumers, achieving marketing objectives, enhancing a company's performance, and encouraging entrepreneurship via the use of digital platforms and technologies on the internet and in other electronic media (Bruce et al., 2023; Ellitan, 2023). Compared to traditional marketing strategies, digital marketing has several benefits, including lower costs, a larger audience, real-time data analysis, and the capacity to customize marketing messages (Pratama et al., 2023).

Digital marketing encompasses a wide range of strategies, including search engine optimization (SEO), affiliate marketing, mobile marketing, email marketing, video marketing, social media marketing, content marketing, and more (Afandi et al., 2023; Bruce et al., 2023; Ellitan, 2023; Masrianto et al., 2022; Ponzoa and Erdmann, 2021; Pratama et al., 2023; Swami, 2023). It enables companies to interact with their audience globally, adjust to shifting consumer preferences, and track the success of their marketing campaigns in real time. In addition to technical skills in digital marketing, behavioral competencies are essential skills that will help people working in marketing in MSMEs fulfill company goals and operate efficiently. These behavioral skills include creativity, thinking, communication, adaptability, personalization, targeting, online consumer interactions, and change management (Royle and Laing, 2014). These soft skills increase the probability that MSME owners and digital marketers will be innovative and successful in their endeavors. As a result, these abilities are critical in the context of digital marketing and require training to improve.

Digital marketing is especially crucial for MSMEs because it helps them compete in the global market, expand sales, and innovate in response to increased competition. (Ellitan, 2023). Digital marketing is critical for MSMEs since it gives several choices for enterprises to better their long-term growth, allowing them to widen their market reach, improve their company visibility, and increase sales (Afandi et al., 2023; Bruce et al., 2023). It helps firms interact on a global scale and adapt to shifting business models towards digitalization (Ellitan, 2023).

Increasing MSMEs’ knowledge, comprehension, and use of information technology is another important function of digital marketing, which promotes company development. Therefore, this research aims to enhance the digital marketing capabilities of marketing professionals, entrepreneurs, and relevant MSMEs in the manufacturing sector. This is achieved by developing a digital marketing course specifically tailored to the needs of MSMEs in these sectors, and by creating an online platform that serves as a channel for knowledge and training. **Table 1** displays the digital marketing capabilities surveyed in the literature review.

Table 1. Summarize the digital marketing capabilities from the literature review.

Digital Marketing Capabilities	Researcher
Planning a Marketing Strategy	Afandi et al. (2023); Pratama et al. (2023)
Personalization and Targeting are Adaptable	Royle and Laing (2014)
Content Creation across Channels	Afandi et al. (2023); Bruce et al. (2023); Ellitan (2023); Masrianto et al. (2022); Pratama et al. (2023)
Brand Building and Public Relations	Afandi et al. (2023); Qian et al. (2023)
Customer Relationship Management	Masrianto et al. (2022)
E-Mail Marketing	Bruce et al. (2023); Pratama et al. (2023)
Video Marketing	Bruce et al. (2023); Swami (2023)
Social Media Marketing	Afandi et al. (2023); Bruce et al. (2023); Masrianto et al. (2022); Pratama et al. (2023)
Mobile Marketing	Masrianto et al. (2022)
Search Engine Organization: SEO	Afandi et al. (2023); Bruce et al. (2023); Ellitan (2023); Ponzoo and Erdmann (2021); Pratama et al. (2023)
Search Engine Marketing	Bruce et al. (2023); Ellitan (2023); Terrance et al. (2017)
Digital Advertising	Ellitan (2023); Masrianto et al. (2022)
E-Commerce	Bruce et al. (2023); Ponzoo and Erdmann (2021)
Digital Marketing Measurement	Ellitan (2023)
Online Event Management	Afandi et al. (2023); Pratama et al. (2023)
Creative Thinking	Royle and Laing (2014)
Communication and Presentation of Marketing Content	Abuzandah and Alshehre (2021); Hamdan and Ratnasari (2016); Vuković et al. (2022)
Interaction with Customer Online	Royle and Laing (2014)
Affiliate marketing	Ellitan (2023); Royle and Laing (2014); Swami (2023)
Change Management	Royle and Laing (2014)

2.4. Enhancing digital marketing capabilities

The necessity of training and mentorship in this field, as well as the significance of digital marketing for Surabaya’s MSMEs. Ellitan (2023) emphasizes the use of

digital marketing to reach target customers and boost sales, as well as the role that information technology plays in the global competitive economy. Afandi et al. (2023) set up digital marketing training to make MSMEs more competitive. The goal of the program was to give MSMEs knowledge and expertise in digital marketing techniques, such as online brand management, social media marketing, search engine optimization, and the generation of high-quality content. The findings suggest that the digital marketing training was improving MSME performance; however, we should enhance and expand future training initiatives.

Zahay et al. (2022) explore the concept of work-based learning and evaluate its suitability for enhancing marketing expertise in small businesses owned and operated by entrepreneurs. Specifically, it looks at how an individualized curriculum might incorporate issues that an entrepreneur faces at work to provide a distinct, worthwhile, and structured learning environment. Besides being valuable and worthwhile, the paper argues that acquiring information in this manner could potentially establish a new field of study. The study explores the possibility of transforming an existing marketing development program for small business owners into a work-based program in order to showcase the possibilities of work-based learning. Bruce et al. (2023) used planned behavior theory to analyze the influence of digital marketing adoption on the long-term growth of SMEs in Ghana. They confirmed a favorable association between the actual usage of digital marketing and SMEs' sustainable development, implying that digital marketing considerably boosted the sustainable growth of SMEs in developing countries such as Ghana. Pratama et al. (2023) hope to improve MSMEs' understanding and use of digital marketing strategies in Banyumas Regency by developing community service projects. They will focus on copywriting strategies and the importance of using English in digital marketing. In order to assist MSME participants in using these strategies to enhance their enterprises, the community service entails imparting knowledge about digital marketing, comprehending copywriting, and performing English copywriting. Based on the results, it appears that MSME participants are beginning to use English copywriting strategies to manage their companies and enhance their digital marketing skills (Pratama et al., 2023). Overall, MSMEs may benefit from digital marketing training if they learn how to use the appropriate marketing techniques and adjust to the ever-changing business environment.

3. Research methodology

The research activities were divided into three phases, as follows: Phase 1 involved surveying the digital marketing needs of MSMEs in the manufacturing business sector. The survey was conducted using questionnaires distributed to a sample group of 400 business owners, digital marketing staff, or executives, complemented by in-depth interviews with marketing experts, business managers, and owners, totaling 10 participants. Subsequently, the research findings were utilized to progress to Phase 2, which involved the design and development of a digital marketing curriculum and online training program. The primary objective was to enhance the capabilities of digital marketing personnel, totaling 80 individuals. Following this, Phase 3 comprised the evaluation of the training program's outcomes, as shown in

Figure 1.

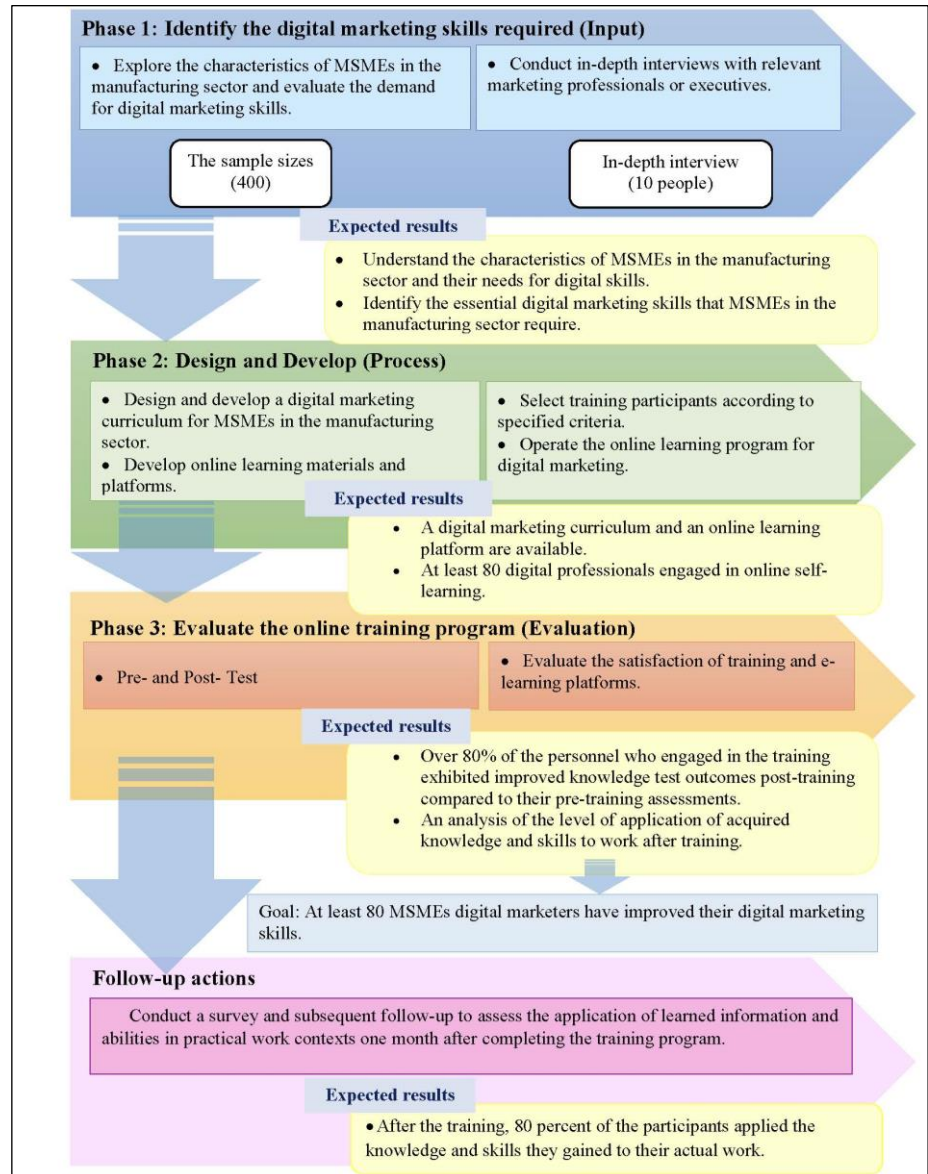


Figure 1. Research methodology.

3.1. Phase 1: Identify the digital marketing capabilities required

In Phase 1, a quantitative survey was used to examine the characteristics of entrepreneurs in the manufacturing sector and the needs for digital marketing skills. In addition to conducting questionnaires with the target population, in-depth interviews were conducted with key stakeholders, such as entrepreneurs, business administrators of MSMEs, and digital marketing specialists. A digital marketing course that is customized to the unique requirements of the manufacturing sector will be created through the application of data analysis techniques derived from in-depth interviews and questionnaires. The questionnaire and interview data collection were focused on digital marketing professionals working in the manufacturing sector. The Cochran's sample size formula (Cochran, 1977) is employed to calculate the optimal sample size required to achieve a desired degree of precision. This technique was

utilized for inquiries pertaining to populations of unlimited magnitude, as depicted in the Equation provided below.

$$n_0 = \frac{z^{\alpha} \times p \times (1 - p)}{e^2} \quad (1)$$

The e -value represents the degree of accuracy and the range of uncertainty. The p -value denotes the proportion of the population expressed as a percentage. The z -value is derived by extracting it from a z -table. The sample population is determined by using a precision of $\pm 5\%$ and a confidence level of 95% (corresponding to $\alpha = 0.05$). Based on the z -tables, the z -value is determined to be 1.96. Therefore, the theoretical sample would consist of the following:

$$n_0 = \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{0.05^2} = 384.16 \approx 385 \quad (2)$$

To account for potential non-response and data collection errors, this study distributed 400 questionnaires and used a convenience sampling method. The convenience sampling approach involved selecting participants based on certain research criteria. For instance, participants were required to be digital marketers working in the manufacturing sector and eager to take part in the study. While acknowledging that the sample may not be fully representative of the total population, our efforts were focused on engaging a wide variety of sources from several firms in the manufacturing sector to mitigate the influence of sampling bias. Additionally, doing extra analysis, such as in-depth interviews, to evaluate the strength and reliability of the findings. The in-depth interviews clearly defined the interviewee's characteristics and study criteria. The interviewees were selected using the purposive sampling method to identify ten essential informants for in-depth interviews. The interviewees were individuals who are experts or administrators in digital marketing, or MSME entrepreneurs with a minimum of six months of professional experience in digital marketing.

Data collection employed both questionnaires and in-depth interviews. The development of these instruments involved a thorough review of relevant concepts, theories, and existing research. We designed questionnaires and interview guides based on this review. The questionnaire comprised two sections: (1) a checklist capturing the characteristics of MSMEs in the manufacturing sector, and (2) a 5-point Likert scale measuring the need for digital marketing capabilities for these MSMEs.

The approach to conducting in-depth interviews considered the many perspectives and potential biases associated with qualitative data interpretation. Recognizing the subjective nature of qualitative research, a variety of strategies were attempted to eliminate bias. First, the interview technique was meant to elicit a diverse range of opinions by selecting participants from various backgrounds within the manufacturing sector, including digital marketers, experts, administrators, and MSME entrepreneurs. The diversity of respondents ensured a wide range of viewpoints, which increased the variety and depth of the data collected. Furthermore, the interview approach was carefully planned to cover a wide range of digital marketing topics in the manufacturing sector, allowing for nuanced arguments and the study of competing viewpoints. Open-ended questions were employed so that participants could freely express themselves without being influenced by the researcher's previous beliefs, with key questions exploring, for example, the nature of the participants' digital marketing

activities, specific challenges encountered in their digital marketing work, and perceived skills and competencies required for effective digital marketing.

This research evaluated the validity and reliability of the questionnaire it employed. This study used the Index of Consistency (IOC) from expert views to assess the items in the questionnaire to see if they aligned with the definitions of terms and research objectives. Cronbach's alpha was used as a statistical measure to assess the internal consistency and reliability of a questionnaire. It quantifies the degree of connectivity between the items on a scale. Its extensive usage, ease of understanding, and ability to detect deficiencies in measuring the questionnaire make it a valuable tool for assessing the questionnaire's reliability.

3.2. Phase 2: Designing and developing a digital marketing course for MSMEs

Building upon the findings of Phase 1, which identified the digital marketing needs of SMEs in the manufacturing sector via questionnaires and in-depth interviews with digital marketing experts or executives, Phase 2 delves into the design and development of a tailor-made digital marketing curriculum and online platform. This phase encompasses the process of creating the online training curriculum, materials, and e-learning website for the digital marketing course of MSMEs in the manufacturing sector, which includes the following steps:

1) Curriculum design

Utilize findings from Phase 1, including questionnaire responses and insights from in-depth interviews with agency experts and executives, to design and develop comprehensive digital marketing that addresses the identified needs of MSMEs in the manufacturing sector, ensuring that the curriculum is structured logically, covers relevant topics in digital marketing, and aligns with learning objectives and standards.

2) Content creation

Professional instructional designers and multimedia specialists are engaged to develop training materials of superior quality. These materials consist of interactive exercises, case studies, presentations, and video demonstrations, all of which are in alignment with our digital marketing curriculum. Multimedia components, including animations, infographics, and simulations, are integrated into our training materials in order to enhance their efficacy. Before disseminating that content on our online platform, we investigated to ascertain its level of engagement, visual appeal, clarity, and conciseness in presentation, all with the intention of promoting learning and retention.

3) Website development

In order to align with the professionalism of the digital marketing training program, we engage in a collaborative effort with seasoned web developers and designers to develop an intricate e-learning platform. To facilitate accessibility across all devices, our online training platform is tailored with an intuitive design, simple navigation, explicit instructions, and a responsive layout. Participants' educational experience has been enhanced through the incorporation of website features including progress monitoring, online discussion forums, and support materials. We verified and corrected any inconsistencies or defects in the training materials and website

functionality before the launch of the online training platform.

4) Participant recruitment and public relations

Commencing this step is the launch of a public relations campaign that aims to inspire digital marketing personnel to enroll in the 80-person online training program. Recruitment criteria will prioritize digital marketing personnel, related personnel, or SMEs operating in the manufacturing sector who express interest and voluntarily apply. Examples of roles may include digital marketing managers, social media specialists, content creators, SEO analysts, or email marketing coordinators. While their primary role may not be digital marketing, they should have some level of involvement or interest in digital marketing activities within their organizations. Applicants will be required to submit a detailed application form. Applicants will be required to furnish details on their present position, duties, and proficiency in the field of digital marketing. Prior to selecting participants for this online training program, the research team may conduct verification checks to assess the candidates' skills and expertise in digital marketing. To reduce bias in participant selection, the recruiting effort will focus on attracting a wide variety of MSMEs that operate in various subsectors of the manufacturing industry. We will make efforts to establish connections with firms that vary in terms of their size, geographical location, and degree of digital advancement. Due to the voluntary nature of participation, there is a possibility of a bias towards people who already have an interest in or involvement in digital marketing. In order to tackle this issue, the recruiting campaign will focus on highlighting the advantages of the training program in terms of improving competitiveness and expanding market prospects. This approach aims to attract a wider range of individuals within the manufacturing industry.

5) Deploy the online digital marketing skills training

The initial online training will provide access to digital marketing courses, which will provide learners with the essential knowledge and abilities to improve their proficiency in digital marketing. Before undergoing assessment through both a pre-test and a post-test, the trainee must fully comprehend and master all classes. Those who complete the course successfully and achieve a passing score on the post-test will receive a certificate. Participants can engage in uninterrupted online digital marketing courses until they successfully finish them. This allows for a certain period for collecting data and promotes the ease of online learning. The online platform will facilitate education from 1 July 2023, to 30 November 2023, spanning a duration of 5 months.

3.3. Phase 3: Evaluate online training

Phase 3 focuses on the systematic measurement, monitoring, and evaluation of participants' training in the online digital marketing course. We will thoroughly evaluate and interpret the data obtained from the specified instruments for pre- and post-training assessment, training satisfaction evaluation, and knowledge application follow-up to accurately assess the efficacy of the training program. This comprehensive assessment utilizes the following tools:

Training Satisfaction Assessment: We must collect responses from the training satisfaction survey to determine the overall satisfaction rate. We scrutinize individual

survey items to identify the strengths of the training program and potential areas for improvement, guided by participant feedback. This analysis enables us to identify aspects of the program that received commendable satisfaction ratings, as well as those that require improvement. We set our target satisfaction rate for the online training program at 80%, indicating a widespread sense of contentment among participants.

Pre- and Post-Training Assessment: We will assess knowledge, abilities, and skills before and after training, ensuring they align with the course objectives and training topics. We will use multiple-choice tests to measure the acquisition of knowledge. Pre-and-post-training assessment conduct statistical analysis comparing pre-training and post-training assessment scores to measure knowledge, abilities, and skills acquisition. Calculate mean scores, standard deviations, and significance levels using *t*-tests to determine if there's a statistically significant improvement from pre- to post-training. A significant increase in mean scores after training indicates successful knowledge acquisition and skill enhancement. Comparisons against pre- and post-training can provide context for interpreting the results and identify specific areas of improvement or knowledge gaps based on the assessment outcomes.

Knowledge Application Follow-up Assessment: We use this assessment to gauge how well the participants have applied the knowledge they learned from the online training program. We compute the knowledge application rate by determining the proportion of participants who attest to using the acquired knowledge and skills in their specific work situations one month after the training. The surveys yielded a more profound understanding of how the participants applied the training material and revealed specific areas that needed further assistance. Attaining an application rate of 80% signifies a triumphant transfer of knowledge from the training program to practical scenarios.

4. Research results

In order to uphold ethical standards and protect the privacy and confidentiality of research participants, it is mandatory for all volunteers to give their explicit consent by signing the consent form prior to engaging in any research-related activities, including responding to the questionnaire, participating in in-depth interviews, enrolling in the online training program, and also assessing their level of satisfaction and proficiency upon finishing the online training program.

4.1. Phase 1 results: A survey of digital marketing capability requirements

Phase 1 adopted a quantitative survey approach to explore the characteristics of manufacturing sector MSMEs entrepreneurs and evaluate their digital marketing competency needs. Data was collected through questionnaires targeted at the population of interest, further enriched by in-depth interviews. The initial phase concludes by establishing the validity and reliability of the employed research instruments, paving the way for the presentation of subsequent findings.

4.1.1. Validity and reliability testing results

- **Validity Testing**

Three specialists in the relevant field evaluated the preliminary questionnaire to

determine if it aligned with the desired concepts (content validity). The Index of Item-Objective Congruence (IOC) revealed that the individual item dependability ranged from 0.67 to 1.0, exceeding the stated requirements and demonstrating satisfactory consistency.

- **Reliability Testing**

Thirty entrepreneurs who were not members of the target population were enlisted to participate in the survey with the intention of evaluating its reliability. The analysis employed Cronbach’s alpha coefficient (Cronbach and Furby, 1970) to evaluate the questionnaire’s internal consistency in its totality. For the elements constituting the digital marketing skills requirements, the Cronbach’s alpha value of 0.88 exceeded the predetermined threshold of 0.70. This implies that the questionnaire demonstrates sufficient data reliability and is suitable for gathering information.

4.1.2. Data analysis of digital marketing competency needs

The examination of fundamental attributes for manufacturing MSMEs identified four crucial factors: production category, workforce size, yearly revenue (in million baht), and operational length. These attributes were analyzed using descriptive statistics, which involved the use of frequency distribution and percentage values. Mean and standard deviation analyses were used to evaluate the extent of demand for digital marketing skills. The comprehensive findings of this investigation are described in **Table 2**.

Table 2. Frequency and percentage of characteristics for manufacturing MSMEs.

Characteristics for manufacturing MSMEs	Frequency	Percentage
Production type		
Agricultural production	68	17
Industrial production	332	83
The number of employees		
Less than 25 people	73	18.2
Between 25 and 50 people	54	13.5
Between 51 and 100 people	38	9.5
More than 100 people, but not more than 200 people	235	58.8
Annual income (million baht)		
Less than or equal to 1,000,000 baht	50	12.5
From 1,000,000–5,000,000 baht	90	22.5
From 5,000,001–10,000,000 baht	52	13.0
More than 10,000,000 baht but not more than 500 million	208	52.0
Operational duration (years)		
Less than 1 year	1	0.2
From 1–5 years	119	29.8
From 6–10 years	40	10.0
More than 10 years	240	60.0
Total	400	100

Table 2 provides valuable insights into the characteristics of manufacturing

MSMEs. The majority (83%) are involved in industrial production, compared to only 17% in agricultural production. Over half (58.8%) have more than 100 but less than 200 employees. More than half (52%) have an annual income of more than 10 million baht but less than 500 million baht. 22.5% have an income between 1 and 5 million baht, 13% between 5 and 10 million baht, and 12.5% less than or equal to 1 million baht. The majority (60%) have been operating for more than 10 years. 29.8% have been in business for 1–5 years, 10% for 6–10 years, and only 0.2% for less than 1 year. **Figure 2** presents the average rating of digital marketing skills needed by MSMEs in the manufacturing sector. While the overall average score is 3.50, highlighting the generally high level of skill required, specific skills vary in importance. Interestingly, although the data did not display the content of this talent, the “ability to generate leads” appeared several times in the top ten. This deserves further examination to determine its precise meaning and importance. Overall, the research indicates that effective communication, customer focus, cross-channel content production, brand building, and online presence via SEO and SEM are critical parts of digital marketing for MSMEs in manufacturing. The top 10 skills identified underscore the need for:

- 1) Communication and presentation of marketing content (3.74).
- 2) Brand building and public relations (3.64).
- 3) Video marketing (3.59).
- 4) Affiliate marketing (3.57).
- 5) Search engine marketing (SEM) (3.56).
- 6) Change management (3.55).
- 7) E-commerce (3.53).
- 8) Digital advertising (3.52).
- 9) Social media marketing (3.51) and mobile marketing (3.51).
- 10) Creative thinking (3.50).

According to **Table 2**, a mere 17% of manufacturing MSMEs are involved in agricultural production, whereas industrial production comprises the majority of 83%. This differentiation implies that the requirements for digital marketing may vary according to the form of production. Industrial manufacturing firms, for example, may prioritize strategies designed to promote complex products or services, whereas agricultural manufacturing firms may focus on digital marketing strategies specifically designed to promote agricultural products. Therefore, applying the findings concerning the need for digital marketing competencies to various manufacturing industry subsectors may limit their generalizability. Additionally, the analysis reveals additional attributes of manufacturing MSMEs, including operational duration, annual revenue, and workforce size. These attributes offer supplementary perspectives on the heterogeneity of manufacturing companies and their requirements for digital marketing. For instance, micro, small, and medium enterprises (MSMEs) that boast greater annual incomes or workforce sizes may possess more ample financial means to allocate towards sophisticated digital marketing approaches. Conversely, MSMEs that have been in operation for brief periods may place greater emphasis on cultivating a robust online presence as a means to contend with more established companies.

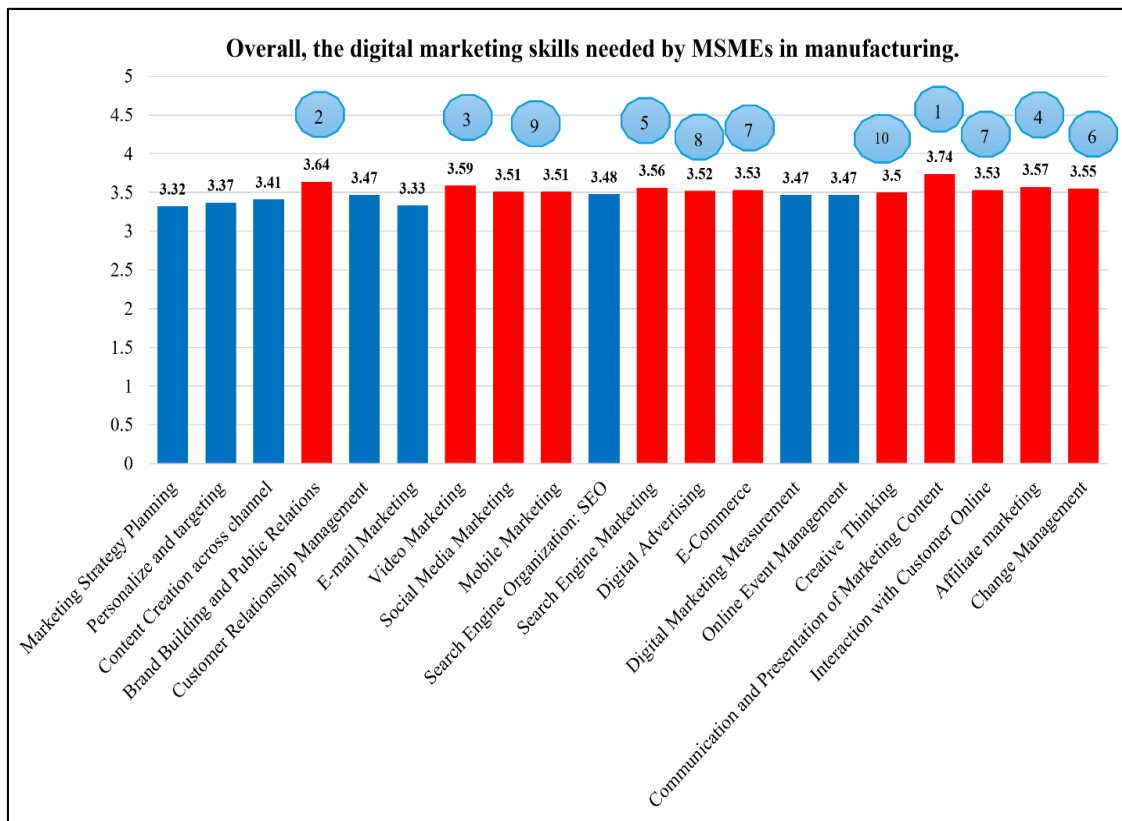


Figure 2. Show the overall digital marketing skills needed by MSMEs in manufacturing.

4.1.3. Results of the in-depth interviews

This study included in-depth interviews with digital marketing specialists and executives from MSMEs in the manufacturing sector. Each individual fulfilled the subsequent requirements:

- held a position as an executive or specialist in digital marketing.
- held a minimum of six months of experience working in the manufacturing sector as a digital marketer.

Following these criteria, a total of 10 individuals were recruited for the interviews. The data gathered from the in-depth interviews was analyzed using content analysis and interpretation. Key topics were found and categorized into pertinent themes using thematic analysis. **Table 3** illustrates the connections made between these themes to provide a more comprehensive understanding of the data.

Table 3 highlights significant findings from interviews with MSMEs in the manufacturing sector on digital marketing job features, obstacles, required skills, and desired government help. This table demonstrates the different abilities and obstacles that digital marketing specialists encounter while working with manufacturing MSMEs. It also highlights areas in which government assistance would be advantageous. Overall, the interview identified two areas that all businesses require: communication and involvement with customers, and the use of Line OA, personal line, and fan page to raise product awareness and reach B2C customers directly.

Table 3. Summary of data analysis findings from interviews with MSMEs in the manufacturing sector.

Topic	Interview participants									
	A	B	C	D	E	F	G	H	I	J
Job characteristics for digital marketers										
Utilize the website to educate B2B clients about your products and foster a relationship of trust.	/	/	/	/	/	/			/	/
Utilize your fan page, personal line, and Line OA to reach out to B2C clients directly and raise product awareness.	/	/	/	/	/	/	/	/	/	/
Direct communication with B2B clients should be done via email.					/	/			/	/
To increase sales, make use of the Shopee and Lazada platforms.			/	/					/	
Problems encountered while working with digital marketing										
Using fan pages is expensive and less accessible. Posting content is subject to certain conditions or prohibitions.					/	/	/	/	/	/
Inexperience with SEO.					/	/			/	
The business can't reach the target group as comprehensively as desired due to the limitations of the platform.		/	/						/	
Employees lack the skills to respond to customers in a timely manner.					/	/				
Essential skills to work in digital marketing										
Understand content creation on each platform.		/	/	/	/	/	/	/	/	/
Learn to use new platforms. and always up to date		/	/				/	/	/	
Know how to select target groups appropriately.		/	/						/	
Have skills in combined O2O (online-to-offline) marketing.	/	/	/	/					/	
Soft Skills										
An attitude or mindset that is good towards customers and marketing work is essential.					/	/			/	
Be modern and up to date with current trends.							/	/	/	
Communication and interaction with customers.	/	/	/	/	/	/	/	/	/	/
Building relationships with customers.	/	/	/	/					/	/
Be creative.									/	
Hard Skills										
Use multiple platforms or tools.		/					/	/	/	
Skills in creating content and using language to communicate stories are required.	/	/	/	/			/	/	/	
Have in-depth knowledge of perishable products or methods of transporting them.	/	/							/	/
Product photography skills.					/	/	/	/		
Thinking of sales promotions.									/	/
There are techniques for finding new customers or responding to specific customers.		/	/						/	/
One employee should have a variety of skills (Multi-skills).									/	
Enhancing the capabilities of digital marketing personnel desiring government assistance										
Entrepreneurs can access complimentary training programs that cover topics like fundamental online marketing, strategies for attracting new clients, exploring international markets, and generating law-abiding content.					/	/			/	/
There are free public relations channels for entrepreneurs.								/	/	

Note: A, B, C, ... means the interview participants from different organization in the manufacturing sector.

4.2. Phase 2 results: Designing and developing a digital marketing course for MSMEs in the manufacturing sector

4.2.1. Results of curriculum design

The curriculum design process for enhancing digital marketing skills within the MSMEs sector was based on Phase 1 of the research and proceeded continuously. This involved incorporating insights from the top 10 digital marketing competency requirements identified through the questionnaire, as well as the issues and needs identified through interviews with experts or agency executives. Both sets of data were thoroughly analyzed and interpreted to develop an online digital marketing training course tailored to address the specific needs and challenges faced by the manufacturing business group. The results of this analysis, which guided the design of the training curriculum, are presented in **Table 4**.

Table 4. Displays the findings obtained from surveys and interviews.

The need for digital marketing skills from questionnaire results	The needs and problems of digital marketing skills from the interviews	Lesson	Design digital marketing curriculum
E-Commerce	Utilize your website to enhance product awareness and establish trust with B2B customers. Using email for direct communication with B2B customers. Utilize the Shopee and Lazada platforms to drive sales.	1	The basics of B2B and B2C digital marketing.
Digital Advertising	Enhance product photography skills. Strategize sales promotions.	2	Social Media Marketing
Media Marketing	Utilize Line OA, personal Line, and Fan Page to foster product awareness and direct communication with B2C customers	2	
Communication and Presentation of Marketing Content	Prioritize customer engagement and effective communication, emphasizing the importance of providing timely responses. Acquire a comprehensive understanding of perishable goods and transportation techniques.	3	Techniques for client acquisition, brand image development, and establishing brand credibility.
Brand Building and Public Relations	At this time, there is a deficiency in the skill set of employees to communicate and interact with consumers in a timely and efficient manner. Analyze the constraints that exist on existing platforms concerning effectively engaging target audiences in their entirety.	3	
Interaction with Customer Online	Recognize the intricacies of platform-specific content development, consumer acquisition strategies, and target audience identification. Develop your expertise in integrated online-to-offline (O2O) marketing. Encourage the development of a customer-centric perspective and attitude in marketing endeavors. Incorporate a wide array of platforms and tools into one's marketing endeavors.	3	
Video Marketing	Use several platforms and tools. Improve your content creation skills. Demonstrates storytelling talents. Fostering creativity.	4	Video marketing.
Search Engine Marketing	Address the SEO competence gap. Recognize the constraints of using Fan Pages, such as high expenses and restricted reach, and adjust to algorithm changes and posting limits.	5	Marketing through search engines optimization: SEO
Affiliate Marketing	Address the constraints of current platforms in reaching target audiences effectively.	6	Creating affiliate marketing
Change Management	Stay up to date with current events and trends. Encourage employees to be multi-skilled. Encourage ongoing learning to adapt to new platforms and stay current.	All lessons	-

4.2.2. Result of the development of an online training platform

This endeavor's objective is to develop online training materials and supporting documentation for enhancing the digital skills of digital marketers in the manufacturing sector. This project's objective is to equip digital marketers, entrepreneurs, and executives with the knowledge and abilities necessary to construct their businesses using digital marketing. The undertaking was executed throughout its three phases: (1) surveying the digital marketing needs of MSMEs in the manufacturing sector; (2) creating an online training platform; and (3) assessing the online training's efficacy. The online training courses were particularly tailored for digital marketing in the industrial sector, utilizing the findings and analyzed data obtained from the questionnaire and in-depth interviews. Every module imparts fundamental understanding and implementable approaches customized to the particular requirements and obstacles encountered in the realm of manufacturing sector. The program developed six online training modules that included the following subjects, with the specific contents of each module outlined below:

Module 1: The basics of B2B and B2C digital marketing. This module offers an introductory overview of digital marketing principles, with a specific emphasis on business-to-business (B2B) and business-to-consumer (B2C). With a particular focus on the manufacturing sector, this module lays the foundation for understanding how to tailor digital marketing strategies by using email to specific target audiences, and the practical skills for utilizing the Shopee and Lazada platforms.

Module 2: Social Media Marketing. This module explores the significance of social media marketing in encouraging manufacturing companies to implement digital marketing strategies. It investigates a variety of social media platforms (such as Line OA, and Fan Page) and strategies designed to increase brand visibility, audience engagement, conversions, and production process dependability, as well as their application in promoting production works.

Module 3: Techniques for client acquisition, brand image development, and establishing brand credibility. This module provides manufacturing companies with an in-depth examination of consumer acquisition, brand development, and trust-building strategies. It examines strategies for cultivating trust among target audiences, attracting, and retaining customers, and establishing a solid brand image, with an emphasis on the business as the targeted consumer.

Module 4: Video marketing. This subject investigates the use of video marketing in the manufacturing industry. It looks at how video may be used to successfully promote items, highlight production processes, and engage audiences. Describes the significance of video marketing for manufacturing companies, the sorts of videos appropriate for the manufacturing industry, and tactics for developing captivating and useful video content.

Module 5: Search engine marketing (SEO). This lesson is centered on search engine marketing (SEO) strategies that are especially customized for manufacturing organizations. The content encompasses techniques to raise exposure in search engine results, generate organic traffic, and bolster online presence. The content covers the essential aspects of SEO for manufacturing organizations, including keyword research and optimization, as well as on-page and off-page SEO tactics.

Module 6: Creating affiliate marketing. This module explains the methodology for creating opportunities for partnership and collaboration in the manufacturing sector. It examines the formation of marketing alliances between product manufacturing companies to capitalize on their respective assets, broaden their market presence, and stimulate expansion. The methodology for identifying potential manufacturing sector marketing partners, the approaches for establishing and sustaining marketing alliances, and the advantages and difficulties of collaborative marketing initiatives are all detailed in the text.

Figure 3 through 6 depict some system interfaces from the project website, which is available at www.elearning.bus.rmutt.ac.th.



Figure 3. Main (system login page).

Figure 4 displays the membership register for a new member who wants to apply to the online digital marketing course.

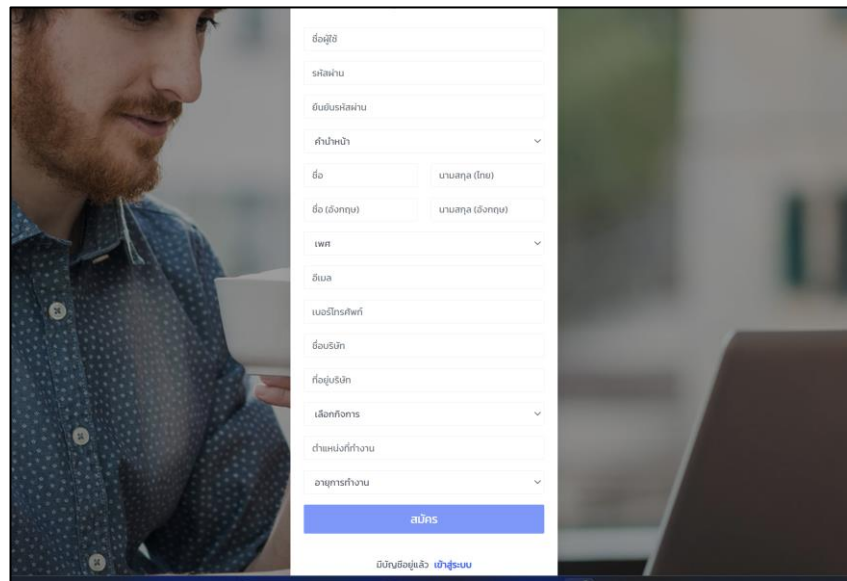


Figure 4. Membership registration page.

Figure 5 depicts the “Lessons/Examinations” menu option, which lists all courses. Each lesson has a video to watch. To proceed to the next lesson, you must watch it until the end. In the menu section, “Pre-study test” will allow students to take

a pre-study test before starting the first lesson. They will be able to know details about how many questions there are in the exam, how many minutes it takes to complete the exam, and the history of taking the test.

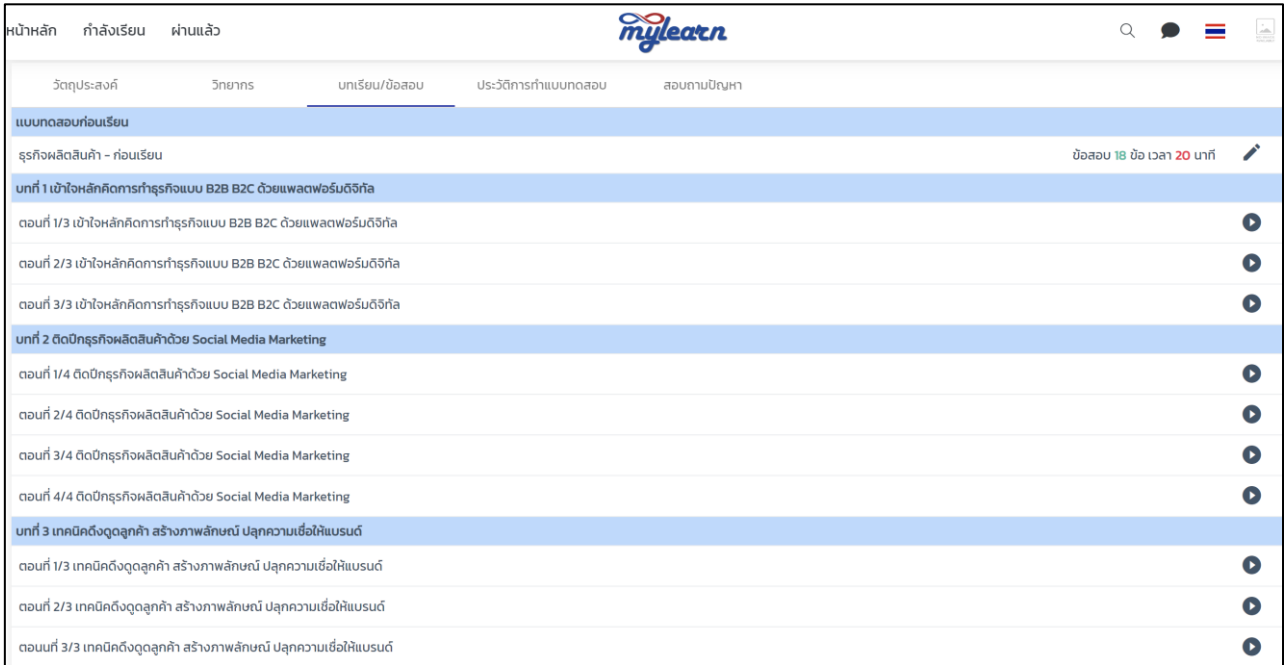


Figure 5. Show course details.

After completing all six lessons, students must take a test after class. The exam contains a total of 20 questions. The exam is random, and students must score higher than 80% to pass. Students are allowed to take the test after class as many times as they wish until they pass. As shown in **Figure 6**, you can also view your past test history to see how many rounds you've taken, how many points you've received in each round, and how many minutes it took.

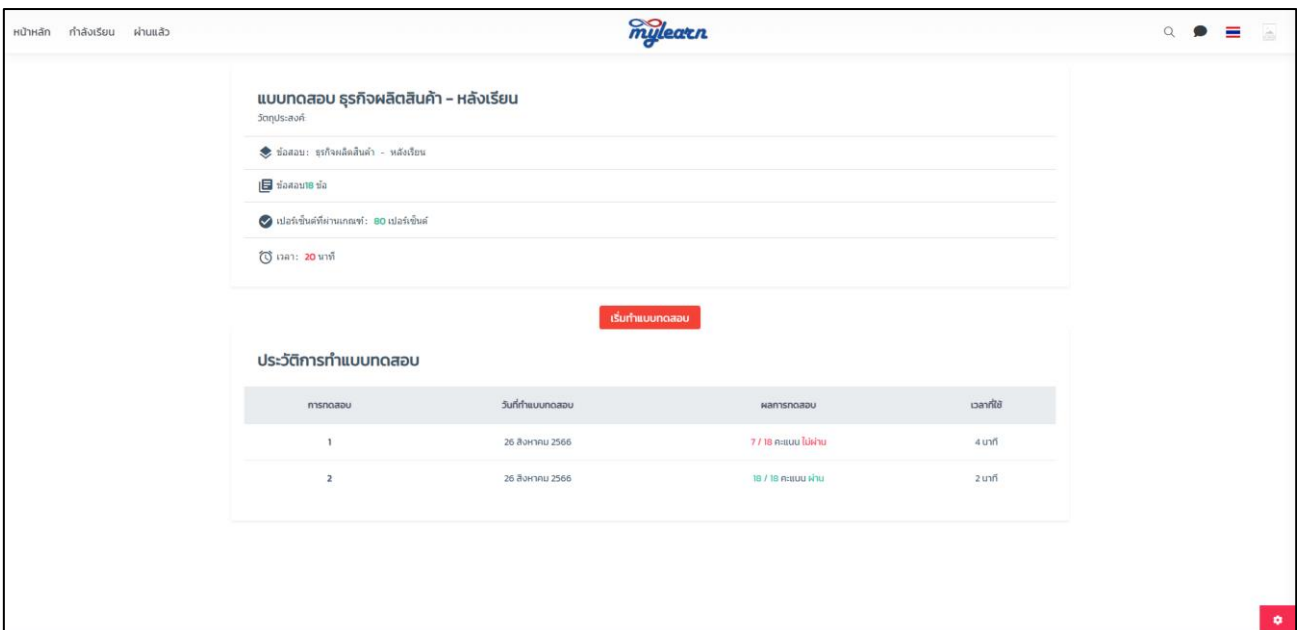


Figure 6. Show post-test page.

4.3. Phase 3 results: Evaluating online training platforms

4.3.1. Assessment results for satisfaction with the online training platform

The satisfaction assessment findings of the digital marketing course for the manufacturing sector and the e-learning website show that participants were quite pleased with the overall lecture arrangement. They gave the lecturers the highest average rating of 4.71 based on their knowledge, experience, and engaging presentation techniques. Furthermore, the majority of participants reported the highest degree of overall satisfaction with both the online course and the e-learning website, with an average rating of 4.64. Furthermore, the majority of participants indicated the highest degree of satisfaction with the information and advantages received from the online digital marketing course, with an average rating of 4.59, as detailed below.

4.3.2. Assessment results for pretest and posttest outcomes

By providing online training, participants can study online digital marketing courses until they finish them. By establishing a timeframe for data collection and facilitating online learning. From 1 July 2023, to 30 November 2023 (a total of 5 months), we aimed for 80 online participants. The study’s findings revealed that 104 participants took online classes over a five-month period. Based on the number of participants, we deem the completion rate of all 104 online classes within 5 months to be a success rate. Online is beyond the aim. Accounting for 130%. The following information was provided by participants in the online training course on developing digital marketing competencies for manufacturing sectors.

The majority of the trainees were female (59.6%) and male (40.4%). The majority had four years of work experience (30.8%), followed by three years (26.0%) and five years (17.3%), with an average working term of 3.51 years. **Table 5** displays the difference in pre-test and post-test scores of participants in the online digital marketing course.

Table 5. Difference in pre- and post-test scores ($n = 104$).

Test Score (Manufacturing sector)	Full Score	\bar{X}	S.D.	T-test	Sig.
Pre training	20	6.47	3.634	27.793*	0.000
Post training	20	16.12	1.396		

Table 5 illustrates the disparities in test scores among 104 trainees enrolled in an online training course on digital marketing for the manufacturing sector. Using a 20-question multiple-choice test, the results indicate that participants’ scores improved after completing the course. The average score post-study was 16.10% ($\bar{x} = 16.10$, S.D. = 1.396), which was notably higher than the average pre-study score. This improvement of 6.47% ($\bar{x} = 6.47$, S.D. = 3.634) is statistically significant at the 0.05 level.

4.3.3. Assessment results for applying knowledge and skills

This includes assessing how participants apply the knowledge and skills gained in their actual work at least one month after completing the online training. An evaluation form was utilized for post-training follow-up, and detailed results are presented in **Table 6**.

After at least one month of training, **Table 6** presents the findings from an analysis of the application of acquired knowledge and skills in real-world work settings. The analysis revealed that the overall application level of knowledge and skills was exceptionally high, with an average rating of 4.46. Upon examining specific aspects, we observed that participants demonstrated the highest proficiency in utilizing the training’s knowledge to improve your organization, achieving the highest mean score of 4.65.

Table 6. Results of applying knowledge and skills.

Applying knowledge and skills	Practical Level		
	\bar{x}	S.D.	Results
1) You can use the training’s knowledge to further your personal development.	4.39	0.686	Very high
2) You can use the training’s knowledge to improve your performance at work.	4.53	0.671	Very high
3) You can use the knowledge you gained from the training to enhance your organization.	4.65	0.603	Very high
4) You have used the knowledge you gained from the training to share or exchange knowledge with colleagues.	4.39	0.710	Very high
5) Overall, do you believe you can effectively apply the knowledge you have acquired for beneficial purposes?	4.58	0.691	Very high
An overview of the levels of knowledge application	4.46	0.444	Very high

5. Discussion

The digital marketing skill regarded as paramount and in highest demand by entrepreneurs and marketing personnel operating within the manufacturing sector is proficiency in communication and presentation of marketing content. The research findings emphasize the significance of communication and presentation skills in marketing for MSME entrepreneurs in the manufacturing sector with the mean score of 3.74. Communication skills are crucial for conveying ideas clearly and convincingly, facilitating successful interactions with clients and partners, and navigating cultural differences in the global corporate world. Presentation skills enable marketers to create impactful presentations, advertise products effectively, and differentiate themselves in the competitive industry. Communication and presentation skills are essential in marketing because they help spread information, promote products and services, and develop relationships with clients and stakeholders. Marketers can use effective communication to convey their ideas and thoughts in a clear and convincing manner, while presentation skills enable them to create entertaining and impactful presentations. These skills are especially important in the context of marketing education, where learners must enhance their talents to provide efficient presentations and receive criticism for improvement (Abuzandah and Alshehre, 2021; Vuković et al., 2022). Additionally, in today’s globalized corporate world, communication skills are essential for navigating cultural differences and facilitating successful interactions with clients and partners abroad (Abuzandah and Alshehre, 2021). Additionally, presentations help businesses advertise themselves by giving them a platform to highlight their products and services and draw attention to them both domestically and internationally (Hamdan and Ratnasari, 2016). In general, for marketers to effectively convey their messages, sell their goods, and set themselves apart in the cutthroat industry, they must possess strong presentation and communication abilities.

In addition, this research found that brand building and public relations skills,

video marketing skills, affiliate marketing skills, and search engine marketing skills are needed to develop the digital marketing skills in demand by entrepreneurs and marketing personnel operating within the manufacturing sector. Proficiency in brand building and public relations is crucial for digital marketing as it fosters a favorable brand perception and builds customer trust (Qian et al., 2023). Brand Building and Public Relations, to be recognized as essential skills for MSMEs in the manufacturing sector to enhance their digital marketing capabilities. Highlights the significance of establishing a strong brand identity and maintaining positive public relations to attract customers, foster brand loyalty, and differentiate from competitors.

Video Marketing Execution identified as a critical skill for enhancing digital marketing capabilities of Thai MSMEs. Indicates the growing importance of video content in digital marketing strategies to engage audiences, convey brand messages effectively, and drive customer engagement and conversions. Because viral short movies on social media platforms may drive a lot of traffic and function as a standard marketing model, video marketing expertise is crucial (Swami, 2023). Proficiency in affiliate marketing is crucial as it enables companies to collaborate with affiliates who can endorse their goods or services, increasing their exposure and generating more revenue (Swami, 2023). Executives and managers of digital marketing should understand search engine optimization techniques and enhance those techniques in order to attract clients (Ponzoa and Erdmann, 2021). Proficiency in search engine marketing is crucial as it aids companies in optimizing their websites to rank highly on search engine result pages, hence boosting visibility and generating more natural visitors (Swami, 2023; Terrance et al., 2017). All things considered, these abilities support successful digital marketing tactics by raising brand value, boosting website traffic, and connecting with a specific audience. Hence, it is imperative to incorporate these digital marketing skills, particularly within the curriculum tailored for Micro, Small, and Medium Enterprises (MSMEs) operating within the manufacturing sector.

Online learning platforms, while useful, face several challenges and limitations. A key issue is the digital divide, where disparities in access to technology can prevent full engagement and exacerbate educational inequalities. Another challenge is the lack of personal interaction, which online platforms struggle to replicate compared to traditional classroom settings, potentially affecting peer collaboration and social learning. Technical issues such as connectivity problems, software glitches, and hardware limitations can disrupt learning and frustrate users. Additionally, online learning demands high self-discipline and motivation, which can be challenging without direct supervision. Limited feedback and instructor support can also hinder learners' ability to clarify doubts and receive timely guidance. Addressing these issues with solutions like enhanced technical support, fostering online community engagement, and offering flexible learning options can help overcome these barriers and improve the effectiveness of online learning. By offering instruction and training in marketing technology, online learning platforms for digital marketing can enhance digital marketing abilities. The online platforms can also assist people in developing their capabilities which are critical in the current digital business climate (Ashar et al., 2021; Ellitan, 2023). This online learning platform enables learners to interact with professionals, receive feedback, and improve their performance. Overall, online learning platforms in digital marketing provide accessible and convenient alternatives

for people to gain knowledge and skills, thereby boosting their digital marketing competences.

6. Conclusion

The survey reveals the general characteristics of MSMEs in the manufacturing sector. The production group's enterprises are clearly micro, with an income of little more than 5,000,000 baht and a minimum of ten years in existence. The majority of enterprises that run production operations are tiny yet have been around for a long time. This figure is similar to a survey conducted by The Office of SMEs Promotion (2021) which found that the number of MSMEs in Thailand's manufacturing sector decreased from 540,353 in 2021 to 518,989 in 2022. Therefore, if a business that has already begun production operations is unable to continue running, it will close.

It demonstrates a change in the way firms operate. If a company sector cannot continue to produce, it must shut down. However, if it can continue to operate, it can do so for an extended period. The length of operation of the product production firm that has been able to function continuously for a long time illustrates the stability of doing business in the manufacturing industry, which may not have a very high rate of return or profit but has operational stability.

The findings from the requirements assessment guided the creation of the online training courses. The initiative created six online training modules, covering the following: (1) understanding the basics of B2B and B2C digital marketing; (2) increasing your product manufacturing firm using social media marketing; (3) techniques for recruiting customers, developing an image, and establishing brand trust; (4) video marketing for the manufacturing sector; (5) search engine marketing (SEO) for manufacturing companies; and (6) creating marketing ties with product manufacturing companies. The course will be available for online instruction from 1 July 2023, to 30 November 2023. Students can access the course at <https://www.elearning.bus.rmutt.ac.th>. The online learning platform and digital marketing course successfully attracted the desired enrollment. 104 people registered for the online sessions and completed the course out of the target of 80 participants; of them, 59.6% were women and 30.8% had four years of work experience.

The majority of participants rated the highest level of overall satisfaction with both the online course and the e-learning website, with an average rating of 4.64. Furthermore, the majority of participants expressed the highest level of satisfaction with the material and benefits gained from the online digital marketing course, with an average rating of 4.59. The satisfaction survey results from the digital marketing course for the manufacturing sector and the e-learning website demonstrate that participants were pleased with the overall lecture arrangement. They gave the lecturers the highest average grade of 4.71 for their expertise, experience, and compelling presentation skills.

The online digital marketing course for MSMEs in the manufacturing sector showed a significant difference in test results between the pre- and post-training evaluations. The study found that after taking the online digital marketing course, participants' communication and presentation skills improved significantly. The average score after training was 16.10 ($X = 16.10$, $S.D. = 1.396$), which is a big jump

from the average score before training, which was 6.47 ($X = 6.47$, $S.D. = 3.634$) at the 0.05 significance level.

Notably, participants who completed the online training's test scores improved significantly after the study, outperforming the pre-study mean scores. This conclusion demonstrates improved knowledge acquisition following exposure to digital marketing concepts via the online learning platform. These findings thus underscore the efficacy of the digital marketing competency-building curriculum and the associated online learning platform in enhancing the knowledge of digital marketing professionals.

After examining how much of the learned knowledge and abilities were used in actual work environments at least one month after training, conclusions were drawn. The study showed that the knowledge and skills applied overall were at an exceedingly high level, with an average rating of 4.46. After examining specific areas, we discovered that participants excelled at applying the knowledge they acquired from the course to improve their company, as evidenced by their highest mean score of 4.65.

The research employed a methodology that involved distributing questionnaires to 400 business owners and conducting in-depth interviews with experts and managers. This mixed-methods approach ensured a comprehensive understanding of the digital marketing needs of Thai MSMEs. The study used pre- and post-training assessments, training satisfaction surveys, and knowledge application follow-up questionnaires to evaluate the effectiveness of the online digital marketing course. These instruments provided a robust framework for assessing the impact of the training program on enhancing digital marketing capabilities. Statistical analysis confirmed the findings' reliability, revealing a significant increase in mean post-training scores compared to pre-training scores. This statistical significance indicates that the course was effective in improving participants' digital marketing skills. The study acknowledged potential limitations, including the use of the convenience sampling method, which could affect the results' generalizability. Despite this limitation, the research made efforts to engage a diverse range of participants from various manufacturing firms. The methodology employed and the statistical analysis conducted enhance the reliability of the research findings, demonstrating the effectiveness of the online digital marketing course in enhancing the digital marketing capabilities of Thai MSMEs.

Overall, the research findings shed light on the significance of digital marketing skills for MSME entrepreneurs in Thailand, particularly in the manufacturing sector, emphasizing the demand for skills such as communication, brand building, public relations, video marketing, and more. The study's findings provide valuable insights into the top skills required to enhance digital marketing capabilities in the manufacturing sector, guiding the development of targeted training programs to effectively address these skill gaps. This research makes a significant contribution to the digital marketing landscape by addressing the specific skill needs of Thai MSMEs, developing a tailored online course, and effectively enhancing digital marketing capabilities in the manufacturing sector.

7. Limitations and future research

The study is being carried out as exploratory research with the goal of

operationalizing. This includes developing digital marketing courses, establishing online learning platforms, and implementing online training, followed by post-training evaluations. A specific timeframe for online learning is established to gauge and assess performance. Consequently, participation in digital marketing courses may not initially be available to individuals from unrelated fields seeking to enhance their knowledge of digital marketing. The study primarily focused on MSMEs in the manufacturing sector in Thailand, potentially limiting the generalizability of the findings to other industries or regions.

Thus, there is a future consideration to broaden access to these courses for the public across various disciplines. Furthermore, we propose additional research to compare the digital marketing competency needs of personnel from diverse backgrounds, potentially necessitating differences in curriculum and training content. Future studies could expand the scope to include MSMEs from diverse sectors to provide a more comprehensive understanding of digital marketing needs across industries. Addressing these limitations and focusing on future research directions can further enhance the applicability and robustness of studies aimed at improving digital marketing capabilities for MSMEs.

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Conflict of interest: The authors declare no conflict of interest.

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