The Effectiveness of the University Knowledge Transfer Program (KTP) on the Performance of Homestay Operators in Sabah: The Role of AI and Website Development

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ARTICLE INFO	ABSTRACT
	This study explores the impact of a Knowledge Transfer Program (KTP) focused on generative AI and website development for homestay operators in Sabah, Malaysia. Aligned with Sustainable Development Goals (SDG), which focuses on 4 (Quality Education) and 17 (Partnerships), Ministry of Tourism, Arts and Culture (MOTAC) strategic plan, and supporting the National Entrepreneurship Policy (NEP) 2030, It assesses the program's impact, evaluates trainer effectiveness, and measures participant satisfaction levels before and after the training. This study seeks to fill the research gap resulting from the scarcity of quantitative studies on the homestay program, as existing research in this area predominantly employs qualitative methods. The program aimed to equip homestay operators with digital skills to improve their marketing strategies and business growth, addressing common challenges like limited infrastructure and weak promotion. The program trained 32 homestay operators from the west coast of Sabah, utilizing a focus group approach with a quantitative methodology. The survey questionnaire was modified, adapted, and adopted from the Kirkpatrick Model to assess the effectiveness of the training. The participants learned to use generative AI tools like ChatGPT and build websites via Google Sites through lectures, hands-on workshops, and surveys. The outcome of the program improved participants' knowledge, problem-solving abilities, and confidence, fostering high engagement and motivation. The collaboration between the Centre for the Promotion of Knowledge and Language Learning under Universiti Malaysia Sabah and Sabah Homestay Association demonstrated positive outcomes in enhancing knowledge and skills through its knowledge transfer program for homestay operators. Findings show high satisfaction levels and strong intentions to apply the learned skills indicate the program's effectiveness. Managerial implications emphasize multi-stakeholder collaboration, AI literacy, and sustainable development, aligning with SDG 4, SDG 17, and NEP 2030. Theoretically, the study applies the Resource-Based View (RBV) and extends the Kirkpatrick Model, linking micro-level training to broader socio-economic goals. This initiative not only supports rural education (SDG 4) but also

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fosters partnerships (SDG 17), contributing to local job creation and income growth. It aligns with the National Entrepreneurship Policy (NEP) 2030 goals and MOTAC's strategic focus on human capital development, thereby enhancing community development and economic sustainability.

1. Introduction

The Knowledge Transfer Program (KTP) in Malaysia was established to facilitate the exchange of knowledge, skills, and expertise among universities, industries, and communities. This initiative aims to bridge the gap between academic research and practical application, thereby enhancing organizational and societal capabilities. KTP is not merely a research grant but serves as a platform for the effective exchange of intellectual property, expertise, and skills among academia, industry, and the community for mutual benefit [1]. The effectiveness of KTPs depends on several factors, including the nature of the knowledge being transferred, the mechanisms of transfer, and the context in which the transfer occurs. Successful KTPs have been shown to support cooperation between universities and industries, provide platforms for the exchange of tangible and intangible intellectual property, and enhance human capital development [2]. However, challenges such as the absence of databases, limited timeframes, inadequate assessment of community needs have been identified in evaluating the community impact of KTPs. Addressing these challenges is crucial for the continuous improvement and success of KTP initiatives [3]. Successful KTPs often involve collaboration among universities, industries, and communities. This collaboration facilitates the exchange of ideas and information, which is crucial for effective knowledge transfer [4]. Overall, KTPs play a significant role in promoting effective knowledge exchange among universities, industries, and communities, thereby contributing to Malaysia's goal of becoming a knowledgeable and high-income nation. The KTP program is expected to significantly contribute to nation building. It will act as a channel for knowledge sharing through creative and innovative methods, resulting in new products and improved tangible processes, where previous study indicate that homestay operators lack of knowledge and skills in entrepreneurship [5].The purpose of this paper is to evaluate how effective knowledge transfer programs (KTP) facilitate the development of Sabah homestay operators, specifically through a tailored training program that utilizes generative AI for marketing and website development. This study also aligns with the needs of homestay operators by supporting Sustainable Development Goals 4 (SDG 4) on quality education and Sustainable Development Goals 17 (SDG 17) on partnerships [6].

This initiative is also aligned with Strategy Eight (human capital development) within Strategy Four of the MOTAC Strategic Plan 2021-2025, a plan designed to strengthen tourism and cultural education institutions, including the Homestay program, which falls under MOTAC's jurisdiction [7,8]. It emphasizes enhancing competencies through continuous specialized courses, training programs, and upskilling initiatives. As part of this effort, the Knowledge Transfer Program (KTP) equips homestay operators with skills in using generative AI (ChatGPT) to write promotional content and develop websites using Google Sites to enhance the promotion of their homestay businesses.

Malaysia's Knowledge Transfer Programme (KTP) plays a pivotal role in advancing the objectives of the National Entrepreneurship Policy (NEP) 2030, which aims to establish a robust entrepreneurial ecosystem. Aligned w shared goals of fostering innovation, collaboration, and sustainable economic growth, this KTP bridges academia, industry, and communities to drive knowledge exchange and capacity building. This synergy directly supports NEP 2030's strategic focus on cultivating creativity, risk-taking, and inclusive socio-economic development [9]. This study examines three core objectives of NEP 2030: Objective (1), creating a holistic entrepreneurial

ecosystem to support inclusive socio-economic development, particularly through homestay programs. Objective (2), embedding entrepreneurial thinking among homestay operators to enhance knowledge, skills, and attitude. Positioning entrepreneurship is a preferred career choice, particularly encouraging rural residents and the younger generation to participate in homestay programs. This aligns with NEP 2030's goal of reducing urban-rural economic disparities and empowering youth through entrepreneurial opportunities in Malaysia's tourism sector. By aligning the KTP's knowledge-sharing mechanisms with NEP 2030's framework, Malaysia strengthens its aspiration for a high-income, knowledge-driven society [9]. The integration underscores the policy's commitment to leveraging academic expertise, industry collaboration, and community engagement to empower entrepreneurs, particularly in rural and tourism-driven sectors like homestays.

In summary, successful KTPs often involve collaboration among universities, industries, and communities. This collaboration facilitates the exchange of ideas and information, which is crucial for effective knowledge transfer [4]. However, the program is not easy to execute due to limited documentation in the literature review, as it involves collaboration with industry players. This research was conducted through a knowledge transfer program, a joint initiative between Universiti Malaysia Sabah and the Sabah Homestay Association, which aimed to equip homestay operators with essential knowledge, practical skills and changing attitudes. This aims to address the research gap due to the limited quantitative studies on the homestay program, as most research in this field relies on qualitative approaches [5,11]. The second gap is the limited research on university knowledge transfer programs (KTP) within the context of the homestay program in Sabah. The knowledge and skills they acquire from this program include using Generative AI for content creation and Google Sites for building websites. In conclusion, KTP and NEP 2030 are complementary initiatives that work together to enhance Malaysia's entrepreneurial landscape by fostering collaboration, innovation, and economic growth.

1.1 Problem statement

The Federal Ministry of Tourism, Arts and Culture Malaysia (MOTAC) offers various training courses for homestay operators, covering key topics such as digital marketing, language skills, cultural sensitivity, and sustainability. Additionally, MOTAC has developed the Malaysian Homestay Programme website, which provides a directory of registered homestay operators for tourists and users to access [10]. This information was shared in response to a question about infrastructure allocation for potential homestay operators. In addition, the homestay program in Sabah, Malaysia, faces several challenges and risks that hinder its growth and sustainability. One of the primary challenges is the lack of infrastructure, which limits the ability of homestay operators to provide quality services to guests. This issue is compounded by poor marketing and promotion strategies, which prevent homestay businesses from reaching a wider audience and attracting more tourists [11]. Therefore, the knowledge transfer program will help homestay operators increase they knowledge and skills in solving this challenge.

First, based on our observations reveal that most homestay operators do not have a dedicated website for their homestay clusters. Some homestays have individual websites managed by cooperatives, while some homestay website fully controlled by government authorities. To address this issue, we have developed a training module to teach homestay operators how to create and manage their own websites using free platforms such as Google Sites. This initiative equips them with essential digital skills and gives them greater control over their own websites. Second, in most cases some SMEs are not capable of creating interesting content on the various platforms [12]. On observations, the content posted by homestay operators is not consistent in social media platform

such as Facebook. Given that most businesses today utilize AI to enhance operational efficiency and overall performance, providing instruction in AI-driven marketing strategies is essential. This aligns with current industry trends, where AI plays a pivotal role in optimizing marketing campaigns and improving guest experiences. It is recommended that homestay entrepreneurs acquire proficiency in English to effectively market their services on social media, especially when targeting international audiences. Therefore, this KTP develops a module for homestay operators to leverage AI, specifically ChatGPT, in creating engaging content for homestay promotions.

1.2 Purpose of the Research

The purpose of this paper is to assess the effectiveness of Knowledge Transfer Programs (KTP) in supporting the growth of homestay operators in Sabah through a specialized training program that leverages Artificial Intelligence (AI) for content generation in marketing and website development. This research aims to develop strategies that improve the performance and visibility of homestays in Sabah. Objective of the program

  i.   To evaluate the impact of the university's knowledge transfer program on the performance of homestay operators in Sabah.
  ii.   To evaluate the trainer of the university's knowledge transfer program on the performance of homestay operators in Sabah.
  iii. To measure the satisfaction levels of homestay entrepreneurs before and after receiving training from university knowledge transfer program, focusing on generative AI-driven for marking and website development.

1.3 Literature Review
1.3.1 Evaluation of the effectiveness of knowledge transfer program

The effectiveness of knowledge transfer (KT) programs in Malaysia has been examined across multiple sectors, such as urban climate adaptation, higher education, workforce employability, heritage preservation in handicrafts, community engagement, health education, and research institutions. This study focuses on the Knowledge Transfer Program (KTP) for the homestay program in Sabah, Malaysia. The selection respondent is homestay operators. Based on previous studies on the evaluation of training and development professionals, participant feedback forms are considered a key measure [13]. These forms assess knowledge gain, skill improvement, and shifts in attitude within the training environment. Secondly, to evaluate the pre-training and post-training, this study evaluates the effectiveness of the Knowledge Transfer Program (KTP) based on the knowledge, skills, and attitudes of homestay operator participants. The survey questionnaire is modified, adapted, and adopted from Kirkpatrik Model [13] and KTP requirement form from UMS, on evaluate the program's effectiveness. To conclude, academics benefited from the KTP by bridging the gap between theoretical research and practical application, allowing them to witness the real-world impact of their work [4].

1.3.2 Generative AI

The literature review highlights a lack of marketing-specific guidance on Generative AI (Gen AI) for practitioners . Generative AI is transforming marketing by changing how marketers communicate with customers, create content, and develop products, and a framework is provided

to help understand its use and limitations [14]. The rapid evolution of generative artificial intelligence (GenAI) tools, such as ChatGPT, has revolutionized marketing by automating content creation, personalizing customer experiences, and optimizing operational efficiency [14-15]. For resource-constrained SMEs and homestays, Gen AI presents a unique opportunity to bridge technological gaps and enhance competitiveness [16]. Generative AI (GenAI) has emerged as a transformative force in marketing, offering novel opportunities for personalization, content creation, and customer engagement. As matter of fact, AI can be beneficial in tourism and hospitality marketing, there must be a synergy between organizational and technological integration [17]. This means that both the technology and the homestay operators need to work together seamlessly to harness AI's full potential. This research explores the applications and usage of Generative AI (GenAI) adoption and usage for small homestay programs. As part of this training, we teach homestay operators basic prompt techniques to helps them create effective marketing campaigns using simple copywriting strategies. The Ai tools that we use for training is ChatGPT.

1.3.3 Website development

This literature review explores the relationship between website development and the performance of homestays, examining various factors influencing this connection. It covers website design, functionality, online marketing strategies, user experience, and the resulting impact on homestay occupancy rates, revenue, and overall success. Digital marketing strategies, including the development of websites and video profiles, are employed to improve the service quality and promotional reach of homestay programs. For example, the Borobudur Homestay Village Association has implemented such strategies to enhance service excellence and digital marketing competence among homestay providers [18]. Several studies highlight the importance of designing dedicated websites for individual homestays or homestay associations. For instance, a study developed a website for Pondok Permata Homestay in Ubud, Bali, to enhance marketing and reservations [19]. The website included pages for accommodations, tour packages, and a reservation menu, addressing the challenge of limited online presence. Recognizing a deficiency in travel lodging options, specifically where platforms such as Airbnb were underutilized, Bangladesh implemented a web-based system to connect hosts and guests [20].

2. Methodology

The knowledge transfer program was conducted at Universiti Malaysia Sabah (UMS) under the Centre for the Promotion of Knowledge and Language Learning, from April 24 to June 23, 2024. Although the training program was designed to span three months, it was completed within this timeframe. This study established a focus group comprising homestay operators from the Sabah Homestay Program, specifically from Kota Belud, Inanam, and Kota Kinabalu — all located along the west coast of Sabah, Malaysia. This marks Phase 1 of the research, which will later be expanded to include other divisions across Sabah. The program partnered with the Sabah Homestay Association (SHA) and initially involved 32 homestay operators; however, only 28 homestay operators successfully completed the program. Mr. Duanis Mogirong, a representative of the Sabah Homestay Association (SHA), assisted in organizing the selection of participants to ensure the program's continuity. This comprehensive training program enhances homestay operator knowledge and practical skills, change in attidude , encompassing pre-training preparation, in-session training, and post-training.

The main activities included training and mentoring individuals on leveraging generative AI tools like ChatGPT for marketing copywriting and building websites for their homestay businesses using Google Sites. The study use simple random sampling to select the participation for this program. Simple random sampling is a method of selecting a sample from a larger population in which every individual has an equal chance of being chosen. This technique ensures that the sample is representative of the population, minimizing selection bias [21]. The study's survey questionnaire was adapted and adopted from validated instruments, drawing from the Universiti Malaysia Sabah (UMS) Knowledge Transfer Program (KTP) progression form, knowledge transfer program from Malaysian Education, and the Kirkpatrick model for evaluating programs [4,22-24].

This study uses 5 Likert scale to analysis the data. This study employs a quantitative approach using Smart Partial Least Squares (PLS) 4 for data analysis to explore the performance of homestays in Sabah. The research is grounded in the resource-based view (RBV) theory, which helps explain how the unique set of resources available to homestay operators impacts their performance [24]. Secondly, it follows the Kirkpatrick Model, which evaluates the effectiveness of professional training programs [13]. In this case, it evaluates the effectiveness of the knowledge transfer program for homestay operators. The KTP project targets key research areas (KRA), with a particular emphasis on education. It seeks to improve the educational standards of homestay operators involved in homestay programs [4]. Based on table 1, it represents the respondent selection for the training program consisted of 32 homestay operators, but only 28 completed the program. The respondents were selected from nine homestay clusters located along the west coast of Sabah, Malaysia, focusing on the Inanam, Kota Belud, and Kota Kinabalu regions. The homestay operators were selected based on recommendations from the homestay coordinators, who determined which operators would participate in the training program. This selection method was employed to ensure the study's objectives were achieved.

Table 1
Selection of respondents for training programs

No	Homestay cluster (West Coast of Sabah)	Total homestay operators	Coordinators	Choose for training
1	Homestay Kg. Lobonglobong (Tanak Nabalu)	5	1	3
2	Homestay Taun Gusi, Kota Belud	24	1	3
3	Homestay Darau Wetland	6	1	4
4	Homestay Id Kalangadan, Inanam	15	1	3
5	Homestay Desa Cinta Kobuni,Inanam	14	1	3
6	Homestay Aki Nabalu, Kota Belud	11	1	4
7	Homestay Walai Dati Koduko	14	1	4
8	I'd pogimpaan Homestay	7	1	4
9	Penampang Homestay	33	1	4
Total		129		32

3. Results
3.1 Demographic

Table 2 show the demographic profile of homestay operators. Based on the analysis, several key findings emerge. In terms of marital status, most homestay entrepreneurs are married, accounting for 64.3% of the respondents. Meanwhile, 32.1% are single, and 3.6% are widowed. This suggests that most homestay operators manage their businesses while balancing family responsibilities. Regarding gender distribution, female entrepreneurs dominate the industry, representing 57.1% of the total respondents, while male entrepreneurs make up 42.9%. This indicates that women play a

significant role in the homestay sector, likely contributing to the economic empowerment of households through tourism-related income. The age distribution of homestay entrepreneurs varies, with the largest proportion (42.9%) being above 50 years old. This is followed by two groups which are 21-30 years old and 41-50 years old, each comprising 21.4% of the respondents. The lowest representation comes from the 31-40 age groups, which makes up only 14.3% of participants. This pattern suggests that older individuals are more engaged in homestay operations, possibly due to greater experience, available property, or post-retirement involvement in tourism-related activities. The income levels of homestay entrepreneurs indicate that most earn relatively modest amounts from their businesses. A significant 71.4% of respondents report earning less than RM2,000 per month, while 25% generate between RM2,001 and RM10,000. Only 3.6% earn between RM10,001 and RM20,000, and no respondents reported earnings exceeding RM20,000. This suggests that despite the potential of the homestay industry, many operators still struggle to generate high revenues, which could be influenced by factors such as market demand, pricing strategies, and business management skills. Overall, the findings highlight that homestay operators are largely driven by married individuals, with female entrepreneurs playing a dominant role. Additionally, a considerable number of homestay operators are aged above 50, which may have implications for business sustainability as younger generations appear less involved. The income distribution further suggests that while homestays provide an additional source of revenue, many entrepreneurs still earn below RM2,000 per month.

Table 2
Results of the knowledge transfer program

Category	Subcategory	Count	Percentage (%)
Marital Status	Single	9	32.1
	Married	18	64.3
	Widower	0	0
	Widow	1	3.6
Gender	Male	12	42.9
	Female	16	57.1
Age	21-30 years old	6	21.4
	31-40 years old	4	14.3
	41-50 years old	6	21.4
	> 50 years old	12	42.9
Homestay Income	Less than RM2000	20	71.4
	RM2,001 - RM10,000	7	25
	RM10,001 - RM20,000	1	3.6
	RM20,001 - RM30,000	0	0
	More than RM30,000	0	0

Note: Demographic factors (N=28)

These insights emphasize the need for targeted support, such as training in digital marketing, and strategic tourism planning, to enhance profitability and ensure the long-term sustainability of the homestay sector.

Based on table 3, the study findings indicate a moderate level of impact and engagement with the program, as evidenced by survey results. The training program's evaluation revealed notable strengths and areas for improvement. The highest mean scores of 3.50 were observed in two critical categories: (1) Willingness to Apply Knowledge and (2) Willingness to Join Follow-up KTP Project. These high scores underscore a strong motivation among participants to implement their newfound skills and knowledge, reflecting the program's effectiveness in encouraging practical application. Additionally, the willingness to engage in future projects highlights the program's

success in fostering interest and commitment to continued learning and development. (3) Skills Development also received a commendable score of 3.29, indicating a positive impact on participants' ability to acquire relevant skills. This suggests that participants gained skills that can be applied to enhance their homestay operations effectively. The (4) Usefulness of Knowledge scored 3.11, indicating that participants found the information reasonably useful for their operational needs. However, there is potential for enhancing the practicality and applicability of the knowledge shared. Lastly, (5) Knowledge Gained received the lowest mean score of 2.86. This moderate score suggests that while some participants acquired significant insights, there may be a need to improve the depth or clarity of the information provided during the program to ensure more consistent learning outcomes. Overall, the KTP program demonstrated success in motivating participants and developing practical skills but could benefit from refining the content to enhance knowledge acquisition and applicability.

Table 3
Impact of the Knowledge Transfer Program (KTP)

	Category	Very Low	Low	Moderate	High	Very High	Total	Mean Score
1	Knowledge Gained	-	-	4	24	0	28	2.86
2	Usefulness of Knowledge	-	-	2	21	5	28	3.11
3	Skills development	-	-	2	16	10	28	3.29
4	Willingness to Apply Knowledge	-	-	1	12	15	28	3.50
5	Willingness to Join Follow-up KTP Project	-	1	1	9	17	28	3.50

Based on table 4, the course evaluation results indicate a high level of participant satisfaction across multiple dimensions of the training program. The highest mean score (4.64) was observed in the category of (1) Good and clear presentation, indicating that participants appreciated the clarity and delivery of the training materials. This finding suggests that effective communication played a crucial role in enhancing participants' understanding of the course content. The second-highest score was noted for (2) Course content and assignments/exercises/workshops relevant to my homestay business" (4.57). This suggests that the training materials were well-aligned with the participants' practical needs, highlighting the relevance of the training to their homestay businesses. (3) Clear and effective practical training also scored highly (4.54), indicating that participants valued the hands-on approach provided during the course. Practical application is essential for ensuring that theoretical knowledge can be effectively implemented in real-world scenarios. (4) Effective use of teaching aids" received a mean score of 4.48, showing that the teaching aids used were perceived as helpful in enhancing the learning experience. This supports the importance of integrating varied teaching tools to facilitate better comprehension. However, the category of (5) Appropriate time allocation for each module" received a slightly lower mean score of 4.25. This suggests that while many participants were satisfied, some may have felt that certain modules required more time for deeper understanding and practice. Lastly, (6) course objectives achieved had the lowest mean score (4.18), indicating an area for potential improvement. It may be beneficial to refine the course objectives and ensure they are clearly communicated and attainable within the course structure.

Overall, the training program was well-received, with mean scores indicating strong satisfaction across most categories. However, future training sessions could benefit from revisiting the course objectives and evaluating the time allocation to maximize effectiveness. This feedback is vital for continuous improvement and ensuring that future programs meet participants' expectations and business needs.

Table 4
Evaluation of the trainer in the Knowledge Transfer Program

	Rating Category	Very Low	Low	Moderate	High	Very High	Total	Mean
1	Course Objectives Achieved.	-	-	4	15	9	28	4.18
2	Course Content and Assignments/Exercises/Workshops Relevant to My Homestay Business.	-	-	2	8	18	28	4.57
3	Good and Clear Presentation.	-	-	1	8	19	28	4.64
4	Effective Use of Teaching Aids.	-	-	1	12	14	28	4.48
5	Clear and Effective Practical Training.	-	-	1	12	15	28	4.54
6	Appropriate Time Allocation for Each Module.	-	-	3	15	10	28	4.25

Based on table 5, the training program showed significant improvements across various dimensions related to website development: (1) Knowledge: The mean score increased from 2.11 pre-training to 3.86 post-training, indicating a substantial gain in knowledge. (2) Problem-Solving Ability: Scores rose from 2.29 to 3.82, highlighting enhanced problem-solving skills. (3) Skill: The mean score improved from 2.29 to 3.79, reflecting improved skills in website development. (4) Interest in Field: Participants' interest increased from a mean score of 3.43 to 4.54, suggesting a heightened engagement and enthusiasm for the field. Overall, the program effectively enhanced participants' knowledge, skills, and problem-solving abilities, while also increasing their interest in website development.

Table 5
Website development

| No	Pre- training		Post- training	
	Level	Mean Result	Level	Mean Result
1	Knowledge	2.11	Knowledge	3.86
2	Problem-Solving Ability	2.29	Problem-Solving Ability	3.82
3	Skill	2.29	Skill	3.79
4	Interest in Field	3.43	Interest in Field	4.54

Based on table 6, the training KTP program demonstrated significant improvements across various dimensions related to Generative AI: (1) Knowledge: The mean score increased from 2.46 pre-training to 3.93 post-training, indicating a substantial gain in knowledge. (2) Problem-Solving Ability: Scores rose from 2.54 to 3.89, highlighting enhanced problem-solving skills. (3) Skill: The mean score improved from 2.39 to 3.79, reflecting improved skills in Generative AI. (4) Interest in Field: Participants' interest increased from a mean score of 3.57 to 4.54, suggesting a heightened engagement and enthusiasm for the field. Overall, the program effectively enhanced the participants' knowledge, skills, and problem-solving abilities in Generative AI, while also increasing their interest in the field.

**Table 6**
Generative Ai for marketing

No	Pre- training		Post- training	
	Level	Mean Result	Level	Mean Result
1	Knowledge	2.46	Knowledge	3.93
2	Problem-Solving Ability	2.54	Problem-Solving Ability	3.89
3	Skill	2.39	Skill	3.79
4	Interest in Field	3.57	Interest in Field	4.54

Figure 1 shows a Knowledge Transfer Program (KTP) session focused on empowering a homestay operator with the skills to leverage Generative AI, specifically ChatGPT, for crafting effective marketing content. The scene highlights practical tasks and a hands-on learning environment. The devices they use include laptops, tablets, and smartphones to practice their writing prompt skills in ChatGPT.
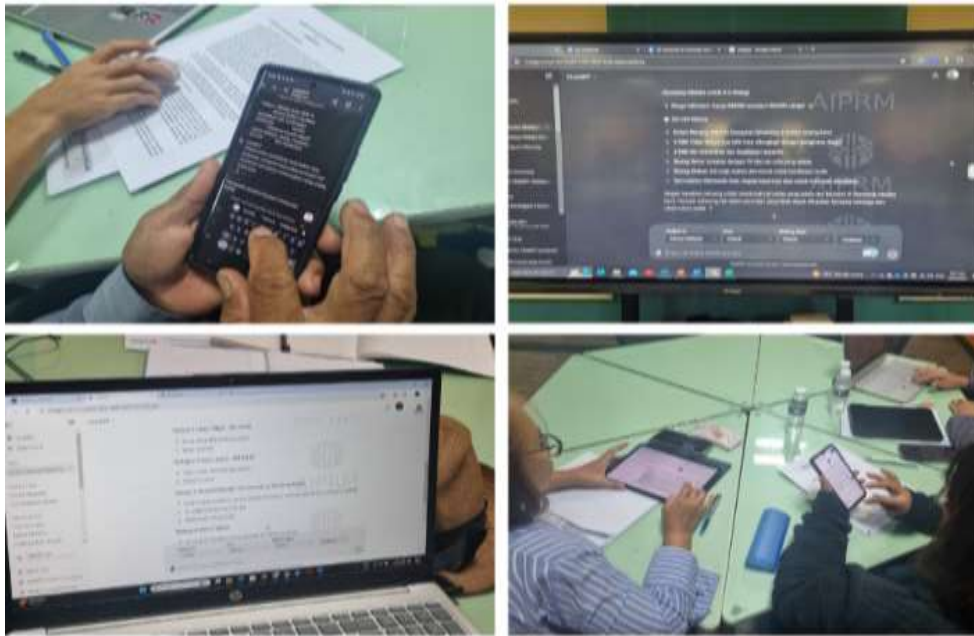
Fig. 1. Training in ChatGPT for generating marketing content

Figure 2 illustrates the practical application of Google Sites by homestay operators to create and manage their homestay business. It demonstrates how these operators are leveraging this free platform to design visually appealing and informative websites for their homestay accommodations. The scene highlights the use of a range of devices, including smartphones, laptops, and tablets, suggesting a flexible and accessible approach to website development and management.
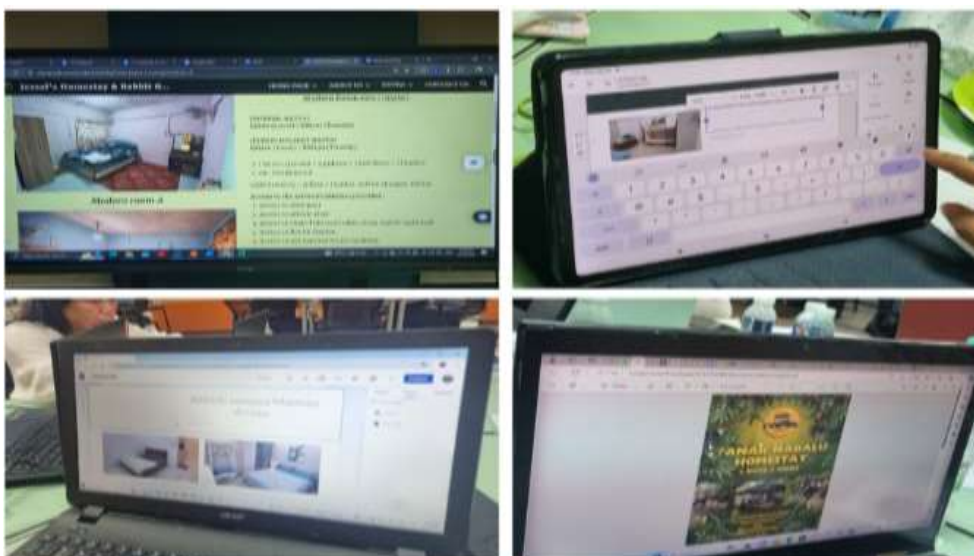
Fig. 2. Training in Website development using Google sites

4. Discussion

4.1 Challenges in Implementing Effective Knowledge Transfer for Homestay Entrepreneurs

Our observations indicate that the knowledge transfer program for homestay operators is troubled by several key obstacles arising from limited resources, demographic considerations, and operational constraints, which collectively reduce its impact.

4.1.1 Limited in entrepreneurial marketing knowledge

Many homestay operators lack essential skills in entrepreneurial marketing, affecting their ability to promote services, and adapting to digital marketing trends. Training in these areas is crucial for improving homestay business growth and sustainability.

4.1.2 Resource constraints

Most participants in the program rely solely on smartphones for digital engagement, as they lack access to laptops and tablet. This limits their ability to utilize tools such as website creation platforms or advanced marketing software. Training relies on using smartphones for future training could help solve this problem by using tools they can easily access on their phones.

4.1.3 Preference for hands-on learning

Based on observation of the program, homestay operators prefer practical, experiential learning over theoretical instruction. Interactive methods like workshops, role-playing, and real-world simulations are more effective for enhancing their skills.

4.1.4 Part-time operators with multiple commitments

Many homestay operators don't dedicate themselves solely to their homestay businesses; they also manage other business ventures or hold separate jobs. Consequently, their limited time and energy due to these additional commitments can hinder their ability to focus on enhancing their homestay operations. Providing them training with adaptable schedules and readily available resources could enable them to learn and improve their skill and knowledge without interfering with their already demanding lives.

4.1.5 Demographic challenges senior citizens' participation

Many homestay operators in the program are senior citizens aged above 50 years old (42.9%), who may face additional barriers such as limited digital literacy or slower adaptability to new technologies, and whereas those aged 21 to 50 are generally proficient in digital literacy. Training programs must consider age-appropriate teaching methods, such as simplified instructions, one-on-one coaching, and peer mentoring systems.

4.2 Discussion of the Findings

As for evaluation of the impact of the knowledge transfer program, the findings emphasize the effectiveness of the training program in enhancing participants' knowledge and skills in generative

AI for marketing content and develop skills in website development literacy. Across multiple dimensions, the program demonstrated a significant impact, suggesting its potential for broader implementation and further refinement. (1) Knowledge Acquisition and Perceived Usefulness, these results align with the broader literature on effective training programs, which emphasize the importance of relevance and applicability in enhancing learning outcomes [22]. (2) Skill Enhancement and Intentions to Apply Knowledge, this suggests that the program effectively equipped participants with essential competencies in AI marketing and entrepreneurship. Moreover, the strong intentions to apply knowledge, with a mean score of 3.50, reflect a high level of motivation and confidence among participants. This is crucial for translating learning into practical outcomes, as noted in studies highlighting the importance of behavioural intentions in knowledge application. (3) Interest in Follow-up Projects, the enthusiasm for future engagement, with 60.7% of participants expressing a "Very High" willingness to participate in follow-up initiatives, indicates a strong desire for continued learning and collaboration. This suggests that the program not only met immediate learning needs but also fostered a community of practice that could support on-going professional development. This aligns with research emphasizing the role of continuous learning in maintaining competitive advantage in rapidly evolving fields like AI marketing.

In conclusion, this study contributes to the understanding of effective training programs in AI marketing and entrepreneurship by demonstrating the potential of well-designed programs to enhance knowledge, skills, and behavioural intentions. Future research should build on these findings by examining the sustainability of these outcomes and exploring strategies to further enhance participant engagement and learning retention.

As for evaluating the KTP program trainer, the course evaluation of results shows a high level of participant satisfaction across various aspects of the training program. Specifically, the value ranged from 4.18 to 4.64. Overall, the training program was well-received, with mean scores indicating strong satisfaction across most categories. However, future training sessions could benefit from revisiting the course objectives and evaluating the time allocation to maximize effectiveness. This feedback is vital for continuous improvement and ensuring that future programs meet participants' expectations and business needs.

This section discusses the measurement of homestay operators' satisfaction before and after participating in the university's training program. The training program for homestay operators in generative AI has shown significant improvements in both pre-training and post-training phases, covering various aspects such as knowledge, problem-solving abilities, skills, and interest in the field. The program's effectiveness is highlighted by its success in strengthening both understanding and enthusiasm for this rapidly evolving generative AI domain. Overall, the training program has proven highly effective in enhancing homestay operators' generative AI capabilities and fostering interest in the field. Based on the results, homestay operators demonstrated increased knowledge, problem-solving abilities, and skills in using ChatGPT to create marketing content. Specifically, the training focused on teaching operators how to leverage ChatGPT for creating compelling marketing promotions. This practical application has led to notable improvements in the operators' ability to generate engaging content for their businesses. The enhancements observed suggest that the training successfully imparted knowledge, developed practical skills, and increased engagement with generative AI technologies. These improvements indicate that the program not only provided theoretical knowledge but also equipped participants with hands-on experience in applying generative AI tools like ChatGPT to real-world marketing scenarios in the hospitality industry. This approach has likely contributed to the high level of interest and engagement among the homestay operators, preparing them to leverage AI technologies effectively in their business operation.

This section discusses the measurement of homestay operators' satisfaction before and after participating in the university's training program. The training program for homestay operators in website development has demonstrated significant improvements in both pre-training and post-training phases, encompassing various aspects such as knowledge, problem-solving abilities, skills, and interest in the field. The program's effectiveness is underscored by its success in enhancing both understanding and enthusiasm among participants, enabling them to create their own homestay websites without relying on consultants.

The training program has proven highly effective in enhancing homestay operators' website development capabilities and fostering interest in the field. Based on the results, homestay operators showed increased knowledge, problem-solving abilities, and skills in using Google Sites to create their own websites for promoting homestay accommodations. This practical application has led to notable improvements in the operators' ability to generate engaging content for their businesses. The enhancements observed suggest that the training successfully imparted knowledge, developed practical skills, and increased engagement with the Google Sites platform.

Overall, by empowering homestay operators to manage their own website development, the program has likely contributed to a higher level of autonomy and efficiency in their business operations. As for the training website development, the training program successfully elevated participants' technical knowledge, problem-solving skills, practical abilities, and interest in website development. The most dramatic improvements were in foundational knowledge, while interest remained the strongest trait overall. This suggests the training was well-rounded, addressing both competency gaps and intrinsic motivation.

4.3 Practical Implications

This finding is useful for homestay operators, homestay coordinators, university trainers, and managers of both government and private agencies. The practical application is crucial to ensure that theoretical knowledge translates effectively into real-world scenarios, focusing on the community within the homestay industry. To achieve this, teaching methodologies should prioritize hands-on learning rather than theoretical instruction as university teaching and learning. By applying lessons directly to homestay operations such as creating marketing posts with ChatGPT and building free websites, homestay operators can immediately use these skills using their smartphone. This approach makes learning more relevant and impactful, helping them improve their businesses effectively. Based on this initiative, the training method will be continuously improved over time for future training sessions. Therefore, after training program finished, survey questionnaires will be given to the participants to give feedback back the KTP program.

4.4 Managerial Implications

The findings underscore the transformative potential of multi-stakeholder collaboration in advancing rural entrepreneurship. For policymakers, institutionalizing partnerships between academia (e.g., Universiti Malaysia Sabah), industry players such as the Sabah Homestay Association, and government agencies like the Ministry of Tourism, Culture, and Environment Sabah (KEPKAS), the Institute for Rural Advancement (INFRA), the Sabah Tourism Board (STB), and Dewan Bandaraya Kota Kinabalu (DBKK) can significantly enhance program scalability and impact. Directors and managers should prioritize training in AI digital literacy, digital entrepreneurship, digital marketing, generative AI, and sustainability certification for homestay operators. These efforts align with SDG 17 (Partnerships for the Goals) and NEP 2030's vision. Furthermore, it is

essential for government agencies such as DBKK, INFRA, KEPKAS, and STB to allocate annual budgets or provide incentives to empower rural homestay operators in Sabah. The outcome of the program collaboration between the Centre for the Promotion of Knowledge and Language Learning under Universiti Malaysia Sabah and Sabah homestay association demonstrated positive outcomes in enhancing knowledge and skills through its knowledge transfer program for homestay operators. These initiatives should focus on AI-driven training programs designed to enhance operators' knowledge and skills in generative AI and website development, particularly through the Knowledge Transfer Program (KTP) offered by universities. This aligns with Sustainable Development Goal 4 (Quality Education), ensuring that homestay operators gain access to high-quality learning opportunities. Insights gathered from these KTP training programs can be utilized to refine teaching methodologies and develop tailored teaching modules for homestay entrepreneurship courses. This well-designed book module can serve as a valuable guide for new or aspiring homestay operators as they begin their journey in the homestay program.

4.5 Theoretical Implications

This research synthesizes different theoretical domains into an interconnected model. By applying Resource-Based View (RBV) Theory in homestay industry, this study demonstrates how intangible resources, such as digital literacy and AI-driven marketing skills, and website development skills become critical competitive assets for homestay operators, aligning with RBV theory [24]. By contextualizing RBV in micro-enterprises, this research expands the theory's applicability beyond conventional firms, emphasizing how even limited resources—when strategically developed through KTP, it can enhance performance. Extension of the Kirkpatrick Model in Community-Based Contexts. The application of the Kirkpatrick Model (1998) to evaluate the Knowledge Transfer Program (KTP) for Sabah homestay operators extends its traditional scope, which primarily focuses on corporate or institutional training. By incorporating community engagement outcomes, such as empowerment, digital inclusivity, and alignment with Sustainable Development Goals (SDGs 4 and 17), this study enriches the model to account for socio-economic impacts in rural and micro-enterprise settings. By aligning KTP outcomes with Malaysia's National Entrepreneurship Policy 2030 (NEP 2030) and SDGs, this study theoretically bridges micro-level training interventions with macro-level policy and sustainability goals. It demonstrates how community programs can operationalize national strategies (e.g., human capital development, entrepreneurial ecosystems) while advancing global agendas like inclusive education (SDG 4) and partnerships (SDG 17). This integration offers a replicable framework for policymakers to leverage KTPs as vehicles for systemic change.

4.6 Limitation and Future Research

A key limitation of this study is its small sample size (n=28), a direct consequence of using focus group methodology, which is limited to the West Coast division of Sabah (Kota Kinabalu, Inanam and Kota Belud). While this approach facilitated in-depth insights, the findings may lack generalizability to broader populations of homestay operators in Sabah. To address this, future research should expand its scope by engaging larger cohorts of participants. For example, giving KTP training into another district in Sabah such as Kudat division, Interior division, Sandakan division, and Tawau division. This future plan can be achieved through collaborations with: (1) Government agencies: such as the Institute for Rural Advancement (INFRA), Ministry of Tourism, Arts and Culture (MOTAC) and municipal bodies like Dewan Bandaraya Kota Kinabalu (DBKK), which

oversee rural infrastructure and urban development. (2) Industry associations: such as the Sabah Homestay Association, this can mobilize participation and align training with the latest trend. (3) Academic institutions: such as Universiti Malaysia Sabah (UMS), this can provide technical expertise in generative AI and digital skills training. Furthermore, systematic evaluations of scalability and policy alignment (e.g., with NEP 2030 and SDGs) would strengthen the empirical foundation for nationwide implementation.

5. Conclusions

The program demonstrated significant success in fostering knowledge acquisition, skill development, and participant engagement. High satisfaction levels, coupled with participants' strong intent to apply learned skills and engage in future initiatives, underscore the program's effectiveness and enduring value. These outcomes highlight the critical role of collaboration between the university, Sabah Homestay Association, INFRA, Dewan Bandaraya Kota Kinabalu (DBKK), and MOTAC in elevating the income levels of homestay operators. Such multi-stakeholder partnerships align with Sustainable Development Goal (SDG) 17, which emphasizes strengthening global alliances to achieve sustainable development. By uniting government agencies, academic institutions, and industry stakeholders, this initiative demonstrates the transformative power of collective action in driving socioeconomic progress which give homestay operators increase it standard of living and provides jobs in the rural areas. This study also increases the level of knowledge gains, Skills and attitudes of homestay operators, which is focused on solving SDG 4, giving quality education, by teaching and learning and give practical real live environments. 2 modules were tough during this program. The program's emphasis on collaboration, skills enhancement, rural upliftment, and sustainability mirrors NEP 2030's core pillars. The findings support MOTAC's strategic goals for 2021-2025, specifically strategy number eight, which aims to develop human capital by enhancing homestay operators' knowledge, skills, and attitudes.

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