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24-26 MAY

The 4th International Conference
Management, Business Administration,
Social Sciences & Humanities | Vol.4

May 24 - 26, 2023

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Prince of Chumphon Campus, Chumphon, Thailand

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MESSAGE FROM THE EXECUTIVE VICE PRESIDENT
KMITL, PRINCE OF CHUMPHON CAMPUS

The 4th International Conference on Informatics, Agriculture, Management, Business Administration, Engineering, Science and Technology (IAMBEST 2023) along with the 8th National Conference on Informatics, Agriculture, Management, Business Administration, Engineering, Science and Technology are the conference for academics, experts, and researchers in the six fields. The conferences are hosted by the King Mongkut's Institute of Technology Ladkrabang (KMITL), Prince of Chumphon Campus during the 24th – 26th of May 2023. The aim of this conference is the exchange stage of idea, knowledge, and research between the researchers from various fields. The continue development of the research provides the exchange the knowledge, connection, collaboration, and integration each other's. All above make the development the community, society, and country.

As the chairman of the IAMBEST 2023, I sincerely thank all committee members for your time and determination of organizing this wonderful conference. I thank all attendees and guests for sharing your research and innovation. The success of this conference is from all of you. I wish exchanging of idea and sharing of knowledge from this conference will give you another step to advance your knowledge and technology and to benefit your communities and countries.

Best wish to all of you.

(Assoc. Prof. Dr. Kamronwit Thipmanee)
Executive Vice President
KMTIL, Prince of Chumphon Campus
Chairman of the Organizing Committee
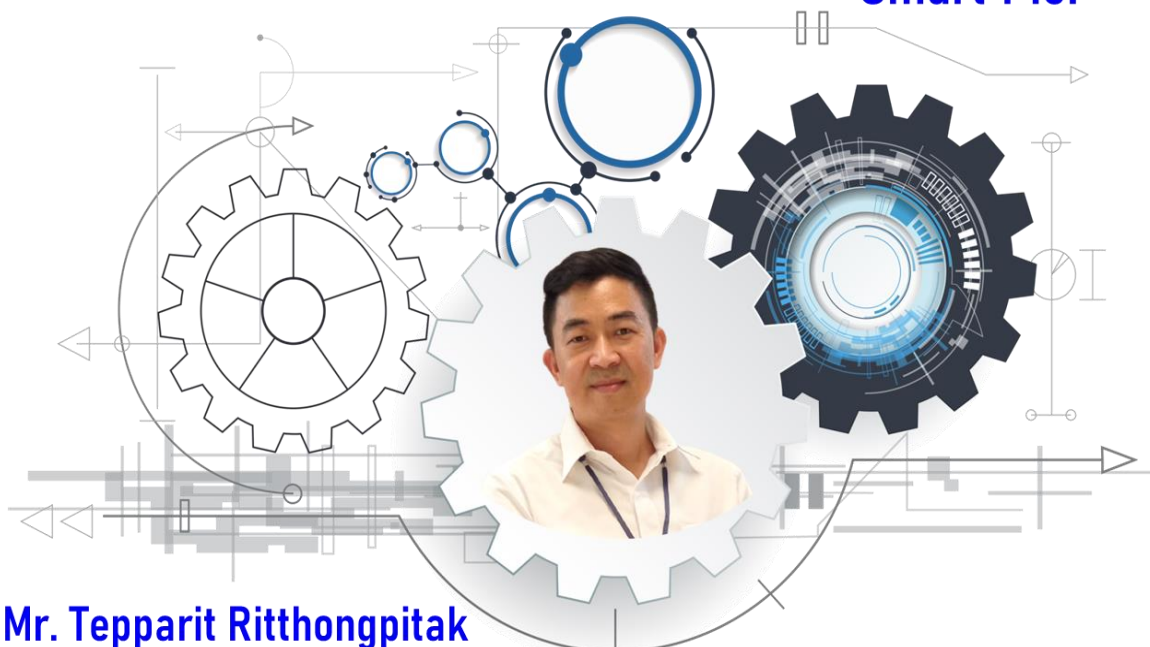
Keynote speakers

Visual Sensors in Digital Transformation Era

Prof. Dr. Kosin Chamnongthai

King Mongkut's University of Technology Thonburi
Vice president (conference) of APSIPA Association

Smart Pier

Mr. Tepparit Ritthongpitak

National Telecom Public Company Limited

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Hybrid Conference**

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Oral Presentation

Marketing Risk Management of Automobile Business

Panaskan Tienchai[1], Chaowarit Chaowsangrat[2*], Thitima Holumyong[3], Suphattra Yodsuranh[4]

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ABSTRACT

This research aims to 1) describe the context of marketing risk management of automobile business, 2) identify problems in marketing risk management of automobile business, and 3) propose guidelines for marketing risk management of automobile business. The researcher conducted a study in Kanchanaburi Province. The research respondents in this study were executives in the automobile business in Kanchanaburi province, the Managing Director, and the Administrative Manager. The data were collected by 15 marketing managers and operators using the interviews method, including Semi-Structured Interviews, Observation for both participants and nonparticipants, and collecting data from Documentary Research through Thematic analysis.

The research results revealed that; 1) According to the marketing risk management in the automobile business, the organization has a risk management policy that is flexible manner. It is gradual management through the formulation of strategies following the situation that arises. The goal is to emphasize and optimize the smooth operation and enhance the company to continue operating business effectively. 2) Risk management problems in economics found that economic volatility affected the market risks of the automobile business. The advancement of automobile technology affects the management of marketing risks in the automobile business because customers are still resistant to new technology. There was no risk management problem in terms of risk management strategies 3) Guidelines for developing economic risk management include launching new products that respond to customer lifestyles at affordable prices and collaborating with financial institutions to create a pleasing customer experience.

Keywords: Risk, Risk management, Marketing, Automobile business

1. INTRODUCTION

The automotive industry is considered one of the main drivers of the country's economy. It is also a targeted industry under the 20-year National Strategy of the current government. The objective is to enhance the country's long-term competitiveness by prioritizing the transition of the automotive industry from conventional systems to intelligent electric vehicles. This involves the adoption of advanced technologies through supportive measures to promote and encourage the integration of cutting-edge technologies in the entire automotive system, in order to ensure that the Thai automotive industry meets global standards and appropriately transfers technology. (Office of the National Economic and Social Development Council, 2018).

Thailand has been a leading car manufacturer in the world. It had an average total production capacity of almost 2 million cars per year, with a market value of around 27,000 million United States Dollar, and employment of over 800,000 to 900,000 people across the industry. (Board of Investment, 2016) According to the latest data from 2021, Thailand's total production capacity was more than 1,685,705 cars, with 956,530 or 56.74% of the total production for export. This represents an increase from the same period last year by 34.91% (Federation of Thai Industries, 2022), despite the Covid-19 pandemic. As a

result, Thailand has been ranked as the largest car producer in Southeast Asia and is among the top 12 in the world, earning it the nickname "the automotive hub of Asia". The country is also the top automotive production base for Japan, the United States, and leading countries in Europe.

However, the future of the Thai automotive industry remains uncertain due to various challenges and risks. For instance, the recovery of the global economy after Covid-19 is still fragile, and the purchasing power of consumers is declining due to the pandemic's impact. In addition, there is a long-term trend of rising oil prices and inflation due to geopolitical tensions from the Russia-Ukraine conflict. According to a report by the World Bank, the global gross domestic product is expected to contract by 5.2% in 2020, the largest decline in 80 years, and it is expected to become even more severe in the future. (The World Bank, 2020) Within the automotive industry itself, there is also a major shift taking place, particularly the transition from traditional cars powered by internal combustion engines (ICE) to electric vehicles (EV), which is a trend that is becoming increasingly clear and significant in the market. All of these factors have direct and indirect impacts on the Thai automotive industry, both at the global and national levels.

In terms of risk management, these crises are risks that gradually emerge and cannot be completely avoided in the automotive industry. Therefore, appropriate risk management should have both short-term and long-term

coping plans and personnel with specialized knowledge who can design both proactive and reactive risk management strategies. This is extremely necessary for the survival of businesses nowadays. Therefore, an empirical study on risk management in the automotive business, particularly in marketing, is relevant and up-to-date with the current situation and future changes. The results of this research can be used as a decision-making guide for managers and business owners to reflect on and adjust their marketing and risk management strategies appropriately, thereby promoting sustainable business growth.

Research objectives

1. To describe the context of marketing risk management in automotive business
2. To identify the problems of marketing risk management in automotive business
3. To propose guidelines for marketing risk management in automotive business

2. CONCEPTS, THEORIES, AND RELARED RESEARCH

2.1 The meaning of risk and the importance of risk management

Risk is the possibility of an event that may occur in the future, hidden in every working system. It is an uncertainty that happens and affects business performances or objectives, making it difficult for businesses to achieve their set objectives. (COSO, 2004)

Therefore, risk management is an essential business activity that enables an organization to survive and grow under changing and uncertain conditions. (Baker et al., 1999) The organization's duty is to deal with the risks that arise, starting with seeking preventive measures and managing risks because risks can lead to losses. All of this can be developed into the main approach to the business operations, in order to control and manage the uncertainties that occur.

Through a selected review of the literature in risk management context, various academics and researchers have defined risk as the possibility of an opportunity that the events may occur and lead to significant (Supoj Kosiyajinda, 1998: 9), or an opportunity that the undesirable events may arise within a specified period or a designated environment. It may be considered in the form of the frequency of unwanted events that occur during a specific time or the likelihood of the unwanted events happening again after having already occurred. (Viriya Ratanasuwan, 2001: 75) It also involves the chance that certain circumstances from a condition or threat that may occur that could result in loss or damage to the business (Chaiyaset Promsri, 2007: 14), and decrease a chance to achieve their set objectives on the national, organizational, departmental, and personal levels. (Jennet Maneenak et al., 2005: 5)

2.2 Risk factors

To have a risk, there must be a cause of risk, which can come from two factors: 1) Internal factors such as culture, organizational structure, personnel, or 2) External factors such as politics, competitors, economic conditions, technology, and so on. (COSO, 2004)

The concept of risk arises from the uncertainty of events that result in losses, meaning it is something uncertain and inevitable. It can occur in every aspect of business or personal life and must be dealt with or managed in different ways. In some situations, risks need to be analyzed and managed, while in others they can be ignored. Therefore, risk management is a particular issue that should be planned in advance to prevent losses from becoming a significant problem. (James et al., 2005: 76-84)

Risk administration or risk management play an important role in a new way of managing, which requires controlling the impacts and opportunities that arise from business operations in order to achieve an organization's maximum goals. Therefore, risk management is like a tool used to analyze risks that may occur, helping to search, reduce severity, controlling and preventing the risk that may occur within the realm of controllability or preventability.

2.3 Risk management process

Most experts agree that risk management should follow the framework of planning, executing the plan, monitoring, and adjusting. The importance of the risk management process can be summarized in four steps as follows; 1) Begin with identifying or recognizing the risk, which involves classifying or specifying what will come into contact with the risk. 2) Conduct a risk assessment or evaluation, which involves assessing the risk in terms of unwanted events that could occur in order to analyze the size, frequency, severity, and significance of the impact of the risk event. 3) Respond or implement risk management through a risk assessment, using methods that align with the organization's policies and objectives. 4) Evaluate and control the risk, which means reviewing the effectiveness of risk management decisions and considering new preventive or risk reduction measures, while continuing to control risk by strategizing and monitoring new risks that may arise. (Gray & Larson, 2006: 209; Wilson, 1999: 95)

2.4 Risk management framework

International risk management standards that are widely referenced include the ISO 31000 standard (Risk Management – Guidelines on principles and implementation of risk management), which was developed from the AS/NZS 4360 risk management standard. This risk management standard can be used by all types of organizations, whether small or large, and covers all industries in both the public and private sectors. Its strengths lie in the fact that it is a standard for risk management practices, making it easy to implement or apply appropriately to an organization. (Kittipong Jirawatwong, 2009) It consists of five steps for risk management:

1) Risk management communication and advisory

Risk management communication is the act of conveying information about risk management to stakeholders both within and outside of the organization. This includes providing advice on the steps and processes involved in risk management to promote understanding of decision-making. It is important to communicate the necessity of risk management and the scope of operations involved in it. Effective communication is key to exchanging information and data among stakeholders to promote mutual

understanding of concepts, principles, and best practices to analyze and manage risk efficiently.

2) Identifying the environment

Identifying the environment of an organization is the identification of both external and internal environments of the organization. Having an impact and are relevant to the organization, they must be brought to risk management process. It includes identifying the external and internal environment as follows:

- Identifying the external environment means the various components outside the organization that have an impact on the success of the organization's objectives. Understanding the external environment helps to create confidence that the stakeholders and their objectives are considered to establish risk criteria. The external environment of the organization includes the economy, culture, financial regulations and laws, the competitive environment both domestically and internationally, and the acceptance of stakeholders outside the organization.

- Identifying the internal environment means the various components inside the organization that have an impact on the success of the organization's objectives. The risk management process must be consistent with the culture, process, and structure of the organization, including policies, objectives, vision, strategies, organizational capabilities in terms of resources and knowledge, stakeholders within the organization, perceptions of value, culture, and structure.

3) Risk assessment consists of three processes as follows:

- Risk identification is the process of identifying the sources and risk factors with the objective of creating a list of risks from events that can cause delays in achieving success.

- Risk analysis is the process of analyzing data to assess risk and make decisions on how to manage risk by considering the impact and probability of the risks. The analysis may be qualitative, semi-quantitative, or quantitative.

- Risk assessment is the process of indicating the level of importance of the risk. It represents the status of the risk that is obtained from analyzing the impact and probability of each risk factor and is divided into levels, such as very high, high, and low. The organization will determine the level of importance of the risk to carry out operations.

4) Risk management includes four strategies as follows:

- Risk avoidance is the process of avoiding activities that may cause risks by making a decision not to initiate or proceed with activities that may pose risks that will have an impact on the organization, such as stopping a project or canceling an operation, and etc.

- Risk reduction is the process of reducing the frequency or likelihood of the occurrence of risks or the impact of risks by controlling or improving the operation to reduce the severity of the loss.

- Risk sharing is the process of dispersing or transferring risks to other departments, organizations, or external parties to help reduce the likelihood or severity of damage from risk, such as insurance in various form, and etc.

- Risk retention is the process of accepting risks because they have a low likelihood of occurring and the impact of the risk is not significant, or it is a risk that has a high cost of risk management which is not worth the potential benefits.

5) Risk monitoring and review means assigning responsibility and timeframes to cover all parts of the risk management process in order to monitor and review risks.

In summary, "risk" is uncertain and inevitable. Therefore, risk management is important in managing an organization, whether it is a government agency, private sector, small or large organization. This is especially important in the Thai automotive industry, which undergoes rapid and continuous changes that can have unavoidable impacts on businesses. This results in the need for automotive businesses to adjust their business strategies and risk management practices to create added value and sustainable growth in the future. The implementation of risk management strategies and practices is crucial to enhance the efficiency of an organization's operations and control the impact of risks, reducing the severity of potential risks in various ways, which will ultimately affect the survival of automotive businesses today.

3. RESEARCH METHODOLOGY

This research was conducted using a qualitative analysis method with important data sources including primary sources obtained from the target group used in the study, and secondary sources obtained from documents and related research studies.

3.1 Primary sources

The primary sources for this study were automobile business operators, including high-level executives, marketing managers, and operational staff in Kanchanaburi Province, totaling 15 individuals.

3.2 Research tools

The research tools used to collect data for this study were semi-structured in-depth interviews, which were the main method of collecting field data, combined with document data. (Galletta, 2013) The questions used were based on a literature review and tailored to the research objectives.

3.3 Data collection

The researcher used three data collection methods for this study, which were:

- Interviews: Conducting semi-structured in-depth interviews using a prepared set of questions, with the content possibly modified based on situational observations.

- Observations: Using both participatory and non-participatory observation methods to study work processes within the organization.

- Data collection from documents: Conducting studies of various documents, including data obtained through research, such as books, academic papers, research studies, and data obtained from related parties, such as the automotive industry, the Bank of Thailand, National Statistical Office of Thailand, Department of Land Transport, and etc.

3.4 Data analysis

The researchers use the thematic analysis method by extracting data from interviews and synthesizing according

to the research objectives. The similarities and differences of the data are organized to reduce unnecessary parts. Then, the researchers interpret the data by attempting to extract the meaning from the available information and find the correlation of the presented data. They also explain and summarize the important content of the research results.

4. RESEARCH RESULTS

4.1 Context of marketing risk management in the automobile business

The study on the context of marketing risk management in the automobile business found that organizations do have risk management policies but not a definite method. It is a situation-specific risk management which the strategies are created to respond with the situation at the time. There is no department responsible for risk management directly within the organization network (branches). Therefore, marketing risk management in the automotive industry is merely managed under the supervision of top management with guidelines to support the potential risk. Communication is made by a hierarchy of responsibility that starts with senior management, department managers, and operational staff, respectively. Risk factors in marketing will be identified and analyzed based on the business profits. At the same time, central staff (from head office) periodically inspect and evaluate the performance and provide comments. However, there is no tracking of risk management strategies that have been implemented because it is just a way to resolve specific situations by observing the overall operation. Risk tracking is simply following the overall organization's operational results under the supervision of top management from the parent organization (head office). The main goal is to emphasize and make the operation smooth and enable the company to continue its business.

4.2 Problems of marketing risk management in the automotive business

4.2.1 External environments

- Economic factors: The study found that economic fluctuations have an impact on risk management. The main reasons are the decreasing purchasing power of consumers, uncertainty about income, increasing household debt, and cost control in an unpredictable economic situation. These factors result in a decrease in demand for products, delayed purchases, and longer decision-making time. The reasons for purchasing are mainly based on value for money.

- Technological factors: The study found that advanced technology in automobiles affects risk management because consumers still resist new technology, changing from traditional cars powered by internal combustion engines to electric vehicles. Even though the engine systems are well-managed, acceptance still occurs only in a small group. Most customers still prefer to use traditional technology and worry about the overall cost, including the lack of charging stations.

4.2.2 Internal environments

- Risk management strategy: The study found no issues with the risk management strategy. It starts with analyzing the overall situation to prepare for coping with potential trends. Training is provided to handle new situations,

together with communication to highlight the importance and awareness of the impact of risky events through various strategies such as streamlining and tightening sales processes. This includes expanding online sales channels for communication, product presentations, and contract signing, which suit the lifestyle of people these days.

- Common values in risk management: The study found problems with common values in risk management, as the organization did not create common values in risk management. In other words, it only emphasizes the importance and impact of risk through analysis and evaluation of the internal situation and exchanging information between departments within the organization. There is no specific department responsible for risk, and there are no common values to follow as organizational practices. This results in unclear division of responsibilities for risk management, leading to inadequate management and the possibility of recurring risks.

- Communication: The study found problems with communication in organizations. There is a lack of written communication, as most communication is done verbally, leading to incomplete information and distortion of information during transmission. The communication process in the organization starts with the head office sending information to branches through branch managers, and down to each department's managers who communicate with employees. There are two types of communication that occur in the organization: communication through meetings for important information and verbal communication for not very important information. The former is considered more important and is done at a higher level, while the latter is done on a smaller scale, either among subgroups or individuals. One of the problems with communication is the lack of supporting documents to emphasize the information, as most communication is done verbally, and is only meant to inform rather than to provide a record of the information, which can lead to missing and distorted information.

4.3 Guidelines for marketing risk management in the automotive industry

4.3.1 External environments

- Economic factors: The study found economic fluctuations affect risk management. The guidelines for managing risk include developing new products that meet customers' changing needs and purchasing power, as well as collaborating with financial institutions to create new value-added experiences for customers through marketing activities that differ from traditional methods, such as extending financing periods, offering down payment assistance policies, or car loan assistance policies that reduce monthly payments. These factors help customers feel that they are receiving good value, and also expedite the decision-making process.

- Technological factors: The study found that advanced automobile technology affects risk management because consumers still resist new technologies. Guidelines for managing risk include establishing electric car rental business models, as most consumers have limited knowledge about electric cars. This will help consumers become more familiar and alleviate concerns about car charging before making a decision. Moreover, continuous development of

longer-term energy storage solutions and increasing product diversity at different price points will cater to different customer groups.

4.3.2 Internal environments

- Common values: The study found problems with common values in risk management. This is because the organization did not create shared values in risk management guidelines. For example, shared values should be created within the organization to guide people's actions and requirements. It can be used as a stimulus to encourage enthusiastic work practices and behavior in the same direction, making personnel see the benefits and importance of leading the organization to success while preventing the recurrence of the same risk.

- Communication: The study found problems there is no written communication, resulting in incomplete message during transmission and sometimes distorted information. The risk management guideline is to use technology to enhance the efficiency of internal communication. This means that the organization should have a system for managing internal documents to be used for communication every time to prevent incomplete content and distorted information. Moreover, the document management system also helps prevent lost documents, makes searching for information easier, and prevents data leaks.

5. CONCLUSIONS

The study on the context of marketing risk management in the automotive business found that organizations do have risk management policies but not a definite method. It is a situation-specific risk management which the strategies are created to respond with the situation at the time. There is no direct responsibility assigned to a specific department for risk management. Risk management is only managed under the control and supervision of senior management, and communication is made by a hierarchy of responsibility. The practice guidelines begin with identifying risks through analyzing the company's performance based on the business profits. In addition, there is no tracking of risk management strategies that have been implemented. The organization's overall performance is simply monitored under the supervision of top-level management from the headquarters, with the main goal of emphasizing and make the operation smooth and enable the company to continue its business.

From data analysis, it was found that the marketing risk management issues in the automotive business can be divided into two parts: problems from external environments and problems from internal environments. These can be explained in detail as follows: "problems from external environments" include economic problems, which means that economic fluctuations affect the marketing risk management of the automotive business, impacting purchasing power and causing delays in decision-making for purchases. Another problem is technological, which means that advanced technology affects the marketing risk management of the automotive business. Consumers still resist new technology, and the acceptance of changing from traditional internal combustion engines to electric cars is limited to a certain group. This aligns with the research by Waewmayura Kamsuk (2018) on factors that affect risks in

the Thai automotive industry supply chain, which found that one of the external risk factors affecting the supply chain is changes in customer preferences due to economic problems and changes in technology, which also affects the automotive supply chain.

"Problems of the internal environments" are that the organization doesn't have a plan or shared values in managing risks, and there is no department responsible for risk management in particular. It was also found that there is a problem with communication due to the majority of communication being verbal, which results in incomplete content in the information transfer, and sometimes distorted information was transmitted as well.

These approaches are developed to cope with the problems of risk management: 1) Economic approaches which include new product developments to meet customers' changing needs and purchasing power. Additionally, collaboration with financial institutions to create a new value-added experience for customers through marketing activities that differ from the past. 2) Technological approaches which include creating a business model to rent electric cars to help familiarize and reduce consumer anxiety before making a purchase decision. In addition, it should continuously develop energy storage systems to last longer, expand electric charging stations, and increase the variety of products at different price points to meet the needs of different customer groups. These approaches are consistent with the research "The vision of Provincial Electricity Authority and the Future of Electric Vehicles." It was found that the changes in the use of electric cars are challenging to adapt to the different electricity usage patterns in the past. Real and continuous cooperation between the government and various private sectors is necessary to create confidence and trust among consumers. Only then will these changes happen quickly. (Samreung Komutsirikul, 2015: 3) Common-value approaches which include creating shared values in the organization as a guide for the practice and common rules of people in the organization. They can be used as a stimulus and persuasion for enthusiastic work and employees' behaviors. It aligns with the research "The role of human resource management in the aspect of risk management." It was found that the success of risk management must come from collaboration between high-level executives of the organization, who must recognize the importance of risk management, and the human resource department that is directly involved in risk management through the process of setting policies, shared values, and risk management practices, as well as transferring guidelines and practices to employees at all levels of the organization. (Chonthicha Tippratum and Preuk Supannalai, 2017) and 4) Communication approaches which include the application of technology to enhance efficiency in communication within the organization. It is consistent with the research "Developing communication skills of logistics cross-border transportation service provider employees to enhance work efficiency" by Ketsaraporn Ngamsuwanchai (2015). It was found that emphasizing and promoting employees' familiarity and application of advanced technology can result in benefits in communication, convenience, and complete data collection.

6. RECOMMENDATIONS

In the context of marketing risk management in the automotive business, it is necessary to implement tools and frameworks for risk management in both academic and practical aspects. As academic guidelines and criteria are like tools used to analyze potential risks to an organization, they help identify, reduce, control, and prevent risks that can be controlled or prevented, leading to more efficient risk management practices.

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Can Community Agricultural Business Group Improve Farmers' Livelihoods Assets? The Cases of Farmers in Na Noi District, Nan Province

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Abstract: This study aimed to analyses the effect of community agribusiness groups on farmers' livelihood assets. The assessment was based on five livelihood capitals; human capital, financial capital, natural capital, social capital and physical capital. The research sample was in Na Noi District, Nan Province, involving 111 smallholder farmers who participated in the community agricultural business group (members), the organic farming community enterprise group, the mango collaborative group and the eggplant group, and 114 farmers who did not participate in the group as a comparison group (non-members). The research applied the Propensity Score Matching (PSM) method and the Difference in Differences analysis (DID) to test the impact of the participation in community agribusiness groups on farmers' livelihood assets. The time period was 2015-2019. The control time was 2015 at which time the groups had not been established and the farmers had not been members; the treated time was 2019. The results found that before participating in the agribusiness groups, farmers who recently participated in the community agribusiness group had statistically significant less livelihood assets in the past (2015) than those who recently did not participate in community agribusiness groups except for the financial assets. Whereas, after participating in community agribusiness groups (2019), farmers who did or did not participate in the community agribusiness groups had similar levels of all aspects of livelihood assets. The results from DID confirmed that, when considering members and non-members with time differences, farmers who participated in the community agribusiness group had statistically significant improved their livelihood assets compared to those who did not participate in the groups.

Keywords: Difference in Differences, Propensity Score Matching, Community Agriculture Business, Livelihood Assets, Smallholder Farmers

I. INTRODUCTION[1]

The community agribusiness group is one option that creates opportunities for smallholder farmers to help each other to improve their quality of life. The group can also link between the company and the farmers involved in the supply chain. Farmers can improve their farm household production, marketing and business from participating in the groups (Khemarat and Sittidaj, 2017). Besides that, agribusiness groups lead to different income, cultural, social and environmental effects. The appropriate type of business depends on the local context. In Nanoi district, Nan province, the community agribusiness groups are mainly operated by farmers as community enterprises. The operation is based on the type of agricultural production. The key purposes for initiating the groups were to increase marketing channels, increase the potential of on-farm operations, strengthen social relationship and improve overall quality of life.

The study on quality of life tends to assess the well-being of people in society. A number of the study assess the quality of life using the concept of Sustainable Livelihood

Framework (DFID, 1999). The framework has key five livelihood assets that consist of human capital, financial capital, natural capital, social capital and physical capital. There were some studies attempt to find the effect of some types of social capital on livelihood assets such as Abenakyo et al. (2007) found that community integration strengthens communities through problem-solving and negotiation skills that results in society trusting and supporting each other. Also Liu et al. (2021) found that supporting technology knowledge to farmers could improve labour capabilities resulting in human capital development and income increase. Therefore, farmers had power to purchase inputs and develop agriculture, leading to the improvement of quality of life and enhancing social capital, physical capital, and natural capital.

Important community agribusiness groups in Nanoi are 1) the group that produce and sell organic products 2) the group that collects and distributes the mango products and 3) the group that farms, packs and distributes eggplant (Budsara et al., 2018). The purposes of the groups are to bring together farmers to provide suitable alternative crops or to jointly produce crops in the area. The groups also aim to manage agricultural product marketing and to sell higher volumes of product outside the community. Relationship

building is another benefit gained from participating in the activities of the group. Farmers can exchange knowledge, farm inputs and labour, and help each other with collecting, grading, packaging, and distributing products. Farmers can also increase their capacity by attending informal training to improve their skills in farming and marketing.

The study of impact of community agribusiness on farmers' livelihood assets was not found in Nanoi district. The study of farmers livelihood assets was found on few study that generally researched the impact of farming systems on livelihood assets such as, Anoosara et al. (2019) and Priyanud, et al. (2022) studied the impact of an agricultural system on farmers' livelihood assets in Nanoi district and found that the integrated farm with livestock showed better livelihood assets than the monoculture system. They mentioned that farmers could increase their ability to manage their farms and that somehow resulted from their attendance at training sessions and meetings as members of community groups or networks. Therefore, this study aimed to analyses the effect of the community agribusiness group on farmers' livelihood assets. The sample was farmers who were member and non-member of local agribusiness groups during 2016-2019. The Propensity Score Method was employed to match the members and non-members and the ATT was used to test the differences of five livelihood assets between the members and non-members.

II. METHODOLOGY

Population and sample

The target population was farmers who became members of the community agribusiness group after 2015 (Member) and farmers in the area who were not members of any community agricultural business group before 2019 (Non-Member). The community agribusiness groups are 1) the group that produces and sells organic products 2) the group that collects and distributes the mango products and 3) the group that farms, harvests and distributes eggplant. The sample size was 111 farmers from the three groups and 114 farmers who were not members of any groups.

Data collection tools

This research used a semi-structured interview to collect data on the basic information of five livelihood assets and farmers' and farms' characteristics. Focus groups involving the leaders and members of the groups was also employed to understand the roles of the groups.

Data analysis

A Likert scale was applied to score the level of livelihood assets. The score ranked from 1 to 5 and an equal interval was assumed between each level. The score of each livelihood capital was averaged by a weighted mean score. The livelihood assets defined as the five capitals, namely, 1) human capital, 2) financial capital, 3) environmental capital, 4) physical capital, and 5) social capital. 1) The human assets consisted of 10 questions on knowledge, skill,

and ability in farm production and marketing. 2) The financial capital consisted of 10 questions on the sufficiency of income, investment, saving, expenditure and ability to access credit. 3) The environmental capital consisted of 4 questions on diversification of the farm, soil condition and the sufficiency of soil nutrients. 4) The social capital consisted of 5 questions on the ability to access information, training and participation in social activities. 5) The physical capital consisted of 4 questions on innovation, infrastructure, and the ability to access technologies.

Propensity Score Matching (PSM) was employed to match the treated group and the non-treated group. In this research the treated group was farmers who were members of any community agribusiness group in Na Noi during 2016- 2019, while the non-treated group was farmers who were not members of any groups during 2016-2019. The PSM regarded similar characters of farm land (rai), farmer age (year) and education (year).

Average Treatment Effect on the Treated (ATT) based on nearest-neighbour matching was used to test the livelihood differences between the member (Treat) and non-member (Non-Treat) samples after matching. The ATT was based on a t-test at 0.05 significant level.

The Difference-in-Differences method was used to compare the changes in livelihood assets overtime between farmers who were group members (Treat) and farmers who were not group members (Non-Treat). The time period was 2015-2019. The control time was 2015 at which time the groups had not been established and the farmers had not been members; the treated time was 2019. The method was based on a regression analysis that considered the livelihood assets as dependents variable and independent variables are time, member of groups and the interaction term between time and member. The regression model was

$Y = b + b_1 time + b_2 member + b_3 (time*member) + m$, where time = {0,1}, 0 is 2015 and 1 is 2019. Member = {0,1}, 0 is non-member, 1 is member. Y is livelihood assets, m is the disturbance term and time*member is the interaction term between being a member of groups for a certain period with continued participation in group activities.

III. RESULTS AND DISCUSSION

The collected data from 111 members (Treat) and 114 non-members (Non-Treat) were reduced to 111 members and 112 non-members after running PSM. The members were, on average, about 53 years old, had 8 years of schooling and had a farm area of 24 rai; while the non-members, on average, were 48 years old, had 7 years of schooling and 15 rai of farmland (Table 1).

TABLE I
DESCRIPTIVE STATISTICS OF FARMERS'
CHARACTERISTICS

Description		Treat	Non-Treat
		n = 111	n = 112
Treatment (%)	Join Group	49.33	50.67
Age (year)	Mean	53.91 (10.51)	48.66 (11.11)
Farmland (rai)	Mean	24.16 (18.92)	15.24 (15.07)
Educational (year)	Mean	7.72 (4.19)	7.67 (3.99)

Remarks: the value in ( ) is S.D.

The livelihood assets of farmers who were members (Treat) and non-members (Non-Treat) in 2015 and 2019 are illustrated in Table 2 and Table 3, respectively. The comparison of the livelihood assets was also tested using ATT and are shown in the Table 2 and Table 3. The results in Table 2 show that in 2015 (the past), members had statistically significant lower levels of livelihood assets than the non-members in almost all capitals except financial capital. However, the results for 2019 (at present) were different from what found in 2015 (Table 2 and Table 3). In 2019, the members' livelihood assets level was as high as the non-members. The result of physical capital was found to have higher level comparing to the non-members (Table 3). The results from Table 2 and 3 showed quite clearly the change in livelihood assets of farmers who were members. Table 4, the DID was employed to test to confirm the livelihood access changes. The detailed results are as follow:

1) Human capital

The results of the comparison of human capital between groups revealed that in 2015 (the past), farmers who were members had significantly lower human capital than those who were not members (2.67 vs 3.46) (Table 2); while, in 2019 (at present), human capital between the two groups was not significantly different (3.68 vs 3.94) (Table 3). The difference was confirmed when testing difference of human capital using the DID method, where it was found that farmers who joined the group as members had a statistically significant improvement in human capital compared to those who did not join the group (Table 4). In line with Anoosara (2019), human asset changes in knowledge and increased competency partly result from joining a social networking group to exchange knowledge and increase opportunities for government support.

2) Financial capital

The results of the comparison of financial capital between groups revealed that in 2015 (the past), farmers who were members had lower financial capital than those who were not members (2.84 vs 3.20) (Table 2) but the differences was not significantly. In 2019 (at present), although the financial capital of the members was higher it was still not different (3.68 vs 3.94) (Table 3). However, when comparing members and non-members using the DID method, it was found that farmers who joined the group as members had a statistically significant improvement in financial capital compared to those who did not join the group (Table 4). The results support the findings of Benchaphun et al. (2016) that farmers who were in groups

that were supported by the assistance provider could improve their financial capital.

3) Natural capital

The results of the comparison of natural capital between groups revealed that in 2015 (the past) and in 2019 (at present), farmers who were members had significantly lower natural capital than those who were not members (2015, 3.84 vs 2.64; Table 2) and (2019, 3.64 vs 3.68; Table 3). However, when comparing members and non-members using the DID method, it was found that farmers who joined the group as members had a statistically significant improvement in natural capital compared to those who did not join the group (Table 4).

4) Social capital

The results of the comparison of social capital between groups revealed that in 2015 (the past) farmers who were members had significantly lower social capital than those who were not members (3.05 vs 3.99; Table 2); while, in 2019 (at present), social capital between the two groups was not significantly different (3.99 vs 4.31; Table 3). The difference was confirmed when testing the difference in social capital using the DID method, where it was found that farmers who joined the group as members had a statistically significant improvement in social capital compared to those who did not join the group (Table 4)

5) Physical capital

The results of the comparison of physical capital between groups revealed that in 2015 (the past), farmers who were members had significantly lower physical capital than those who were not members (2.88 vs 3.71; Table 2); while in 2019 (at present), even though the physical capital mean score of members is higher than non-members (4.00 vs 3.71), it was not significantly different (Table 3). The difference was confirmed when testing the difference of physical capital using the DID method, where it was found that farmers who joined the group as members had a statistically significant improvement in physical capital compared to those who did not join the group (Table 4).

TABLE 2
LEVEL OF FARMERS' LIVELIHOOD ASSETS AND
THE ATT RESULTS IN 2015

Livelihood Assets	Member	Non-member	ATT	S.D.	t statistic
Human capital	2.67	3.46	-0.47	0.21	2.19*
Financial capital	2.84	3.20	-0.28	0.17	1.62
Natural capital	2.84	3.64	-1.09	0.28	3.92*
Social capital	3.05	3.99	-0.83	0.31	2.71*
Physical capital	2.88	3.42	-0.57	0.29	1.98*

Remarks: 4.21-5.00 = Very high, 3.41-4.20 = High, 2.61-3.40 = Moderate, 1.81-2.60 = Low, 1.00-1.80 = Very low

    * statistically significant difference at the 0.05 level of the t-test value in the ATT analysis

TABLE 3
LEVEL OF FARMERS' LIVELIHOOD ASSETS AND
THE ATT RESULTS IN 2019

Livelihood Assets	Member	Non-member	ATT	S.D.	t statistic
Human capital	3.68	3.94	-0.02	0.21	0.08
Financial capital	3.12	3.23	-0.14	0.17	0.79
Natural capital	3.64	3.68	-0.70	0.21	3.27*
Social capital	3.99	4.31	-0.23	0.27	0.84
Physical capital	4.00	3.71	0.09	0.25	0.37

Remarks: 4.21-5.00 = Very high, 3.41-4.20 = High, 2.61-3.40 = Moderate, 1.81-2.60 = Low, 1.00-1.80 = Very low
* statistically significant difference at the 0.05 level of the t-test value in the ATT analysis

TABLE 4
RESULTS OF DID ON FARMERS' LIVELIHOOD
ASSETS

	Human capital	Financial capital	Natural capital	Social capital	Physical capital
Time	0.442*	-0.011	0.054	0.257*	0.248
	(0.107)	(0.104)	(0.132)	(0.127)	(0.130)
Member	-0.815*	-0.389*	-0.784*	-0.998*	-0.572*
	(0.108)	(0.104)	(0.132)	(0.127)	(0.130)
Time*Member	0.549*	0.352*	0.775*	0.680*	0.806*
	(0.152)	(0.147)	(0.186)	(0.180)	(0.183)
Constant	3.504	3.223	3.662	4.061	3.478
	(0.076)	(0.074)	(0.093)	(0.090)	(0.091)
R^2	0.252	0.041	0.114	0.199	0.139
N	450	450	450	450	450

Remarks: * statistically significant difference at the 0.05 level
The value in ( ) is S.D.

IV. CONCLUSION

This study attempted to discover whether local agribusiness groups can improve farmers' livelihood assets. The samples were farmers who were group members and farmers who were not group members as the treated and non-treated groups, respectively. The sample size was 111 farmers from the three groups and 114 farmers who were not members of any groups. The time period was 2015-2019. The control time was 2015 at which time the groups had not been established and the farmers had not been members; the treated time was 2019. The livelihood assets defined as the five capitals that consist of 1) human capital, 2) financial capital, 3) environmental capital, 4) social capital, and 5) physical capital. The study employed the Propensity Score Method to match the members and non-members. The ATT was used to test the differences between the members and non-members. Moreover, the Difference in Differences evaluation was applied to confirm the change over time between the members and non-members. The results show that before joining the groups (2015) members had statistically significant lower levels of livelihood assets than non-members except financial capital. In 2015 (the past), the members found to have moderate level of livelihood assets, while the non-members were mostly found to have high level except financial

capital. On the other hand, in 2019 both members and non-members were found to have similar levels of livelihood assets. In 2019 (at present), the members even found to have higher level of physical capital comparing to the non-members. Both members and non-member were found to have high levels of livelihood assets except financial capital. The results, confirmed using the DID method, demonstrate that farmers who participated in the community agribusiness group had statistically significantly improved their livelihood assets compared to those who did not participate in local agribusiness groups.

The results confirm that joining local agribusiness groups leaded farmers to improve their livelihood assets; therefore, supporting farmers to cooperate community agricultural business group should be as priority to sustain famers' quality of life.

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Enhancing a running skill in the topic of starting techniques through online video productions: A case of eleventh graders

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Abstract: The current condition of physical education instructors is quiet behind the line for it has a few limited teaching materials, such as graphic media, posters, drawings, cartoons, and video media to help demonstrate on behalf of teachers specifically on short running skills. The objectives of this study were to; 1) develop an online video to promote running skills of starting techniques for secondary 5 (grade 11) students; 2) To compare students' achievements before and after learning through the online video to promote running skills of staring techniques for secondary 5 (grade 11) students, and 3) To examine student satisfaction with the online video to promote running skill of staring techniques for secondary 5 (grade 11) students.

This study used an experimental research design. The sample comprised 15 secondary 5 (grade 11) students at Thammasart klongluang wittayakom school, Klongluang district, Pathum Thani province, derived through simple random sampling. The instruments used for collecting the data were an online video to promote running skills of staring techniques for secondary 5 (grade 11) students, a pre-test and a post-test, and a student satisfaction form. The statistics used for analyzing the data were percentage, mean, standard deviation, and the t-test for the dependent sample.

The research findings revealed that the online video to promote the running skill of staring techniques for secondary 5 (grade 11) students was efficient following the criteria E1/E2 (80. 65/87. 34) . The students' achievements after learning the application were higher than before learning it. The mean and standard deviation before learning were 17.12 and 1.08 while after learning they were 16.75 and 1.34. The t-test score between before and after learning was 11. 57, with a significant difference at the. 05 level. Student satisfaction with the online video to promote running skills of staring techniques for secondary 5 (grade 11) Students was at the highest level with a mean of 4.71. The result of this study is relevant for students for higher academic achievement and for teachers to effectively design educational videos for running skill that will be established in class.

Index Terms— **Online video, Staring techniques, Learning promotion, Enhance learning.**

I. INTRODUCTION

Nowadays, teaching and learning must focus on providing students with critical thinking skills, problem-solving, taking action, and developing skills such as music, art, and sports to increase educational and learning opportunities and reduce educational inequality. Based on the National Education Reform Plan (2020), Section 6, Section 69 state policy guidelines, should provide and promote research and development of science, technology, and arts in various fields to educate, develop and innovate for the strength of society and strengthen the national capacity, as well as to establish a vision focused on all Thai people to receive quality education and lifelong learning by reforming digitalization through the National Digital Learning Platform. (National Digital Learning Platform: NDLP) leverages digital technology. Bring knowledge and learning methods to school's student Teaching and learning must focus on providing students with critical thinking skills. Think about problem-solving, take action rather than memorize textbooks, and not just focus on improving

academic skills. Instead, they must develop skills such as music, art, and sports, to increase educational and learning opportunities and reduce educational inequality as much as possible, as well as allow teachers and education personnel to be able to adapt their roles as facilitators by emphasizing that learners have a way of finding knowledge in the vast world of knowledge to keep up with the changes in the digital age in the 21 centuries.

In recent studies, Philip et.al. (2014) with their research about How video production affects student's engagement, their findings was shorter videos are very essential and engaging for students, also informal talking videos are more engaging than formal ones, most importantly they highlighted in their research that students engage differently with lecture and tutorial videos.

Advances in technology have enabled the production of video media to promote learning to be offered across a wide range of channels, both offline and online. Off-the-books education can be provided to students and interested parties at all levels. Adisak Ketchum (1) has said that the unique feature of the video, it is animated. Sounds, letters, still

images, graphics, and effects make the learning process with video media interesting. It has also progressed to the heart of learning that is not limited only to the classroom or only in the defined textbooks. Video media is therefore a very interesting medium for content. Kalya Vanichbok and faculty (2) researched the study of attitudes, behaviors, and factors affecting consumer trends in stream advertising media on online video segments. The results of surveys from various agencies show that Thailand's population has seen a significant increase in internet usage in the modern era, and most of them focus on the use of social media available through various apps, preferring social media via mobile phone or smartphone, according to a survey by ETDA, which has seen 66.6 percent of people watch online videos. According to 83 percent, 83 percent favored YouTube sites, and 81 percent said YouTube was the first site to visit the video. The factors that make YouTube so popular in Thailand are the wide range of content and quality, and YouTube is more than just an area where viewers can share video clips but also allow new producers to work agilely.

Video on Demand is a system that has a large amount of video storage hubs stored in the form of large data sources. When a user wants to browse any item, they can choose from their preferred database or a social media platform such as YouTube, Facebook, Twitter, etc., so it is a system that can be used in terms of instruction without time and location restrictions. Learners can freely choose what they want to learn or care about. When teachers upload video files on social media, such as YouTube, it's a great way to enhance learning. This makes it convenient and interesting for learners to watch to review their knowledge at any time.

According to the researchers who collected the data by interviewing instructors with targeted learners, the current condition has few limited teaching materials, such as graphic media, posters, drawings, cartoons, etc., and physical education instructors also need video media to help demonstrate behalf of teachers. Students can practice their short running skills according to the video clips, which, when briefed on national issues, found the problem of Thai youth's lack of knowledge. A basic understanding of sports training to target excellence Lack of motivation, and lack of teaching materials that promote a thorough understanding of the game. Rules, rules, etiquette, and many sub-practices to understand and practice. Since running is important and necessary for children of this age because the physical condition is strong, active, and ready to train continuously and with high endurance. If not promoted, it will result in a shortage of school-level athletes, resulting in a chain effect to a shortage of athletes on the national team who represent them to compete and build a reputation at various locations at home and abroad.

As a result of the above-mentioned problematic conditions, the researchers conducted a research study on the development of an online video to enhance the practice of running skills on starting techniques for fifth graders to

help solve problems in class, encouraging widespread learning on social media. Help students learn to practice their skills to start fluently. Inspire athletes to train on their own, leading to successful learning and becoming professional athletes in the future.

II. Data used

The population of this study consist of 75 students, the researcher picked a sample of 15 students in eleventh graders at Thammasat Khlong Luang Wittayakhom School. Khlong Luang District, Pathum Thani Province, which is studying semester 1, of the academic year 2035. It was acquired by a simple random sampling method.

The researcher conducted the research by undergoing the following procedures; produced 5-minute online video media in a demonstration format for the starting technique, divided into three phases which are entry range, watch out range, and pedaling phase out of the Start block after the gunshot signal. The researcher then used the technique of alternating images of hosts and performers, stacking graphics. The text makes it easy to explain and upload the file to a YouTube site. After that, the researcher created a pre-school and post-study quiz of type 4 Options Number 40 The IOC: Index of Item Objective Congruence and then selects the test with a difficulty value between 0.20-0.80 and then select a difficulty test between 0.20-0.80 of 20. Article, then the researcher created a satisfaction questionnaire with a scale of 5 values. Level according to the Likert Scale, 20 questions, all ranks, and Angkana Saiyot (3).

After the procedures, the researcher determined the consistency index of the question. The Index of Item Objective Congruence (IOC) determines the difficulty (p) and classified power (r) of the pre-school and post-study tests. Find the confidence of the pre-school and post-study tests based on the formula KR-20 (KUDER Richardson - 20). For the t-test, the researchers analyzed the comparison of hypothesis tests comparing learning outcomes from the same sample. The statistics used to analyze this research hypothesis are t-test Dependent with a significant level of 0.05. Finally, the researcher found out the satisfaction level of 5th graders who studied with online video media about starting techniques using statistical values in the analysis: Average (Mean) and Standard Deviation (S.D.)

III. Methodology

This study will use an experimental research design. It is experimental because it aims to test the accuracy of the online video productions by determining if the research instrument is efficient enhancing techniques for running skills of grade 11 students. For this experimental model, the researcher carries out the study on the population and

sample groups by applying pre-test and post-test (One
Group Pre-test – Post-test Design) as follows:

Sample	Pre-Test	Activities	Post-Test
A	X_1	Y	X_2

A Sample Group
X_1 Measurement of pre-test score
Y.   Instructional activities using online
    gamification through online digital platforms
    to enhance basic English

III. RESULTS AND DISCUSSION

Determining the effectiveness of online video media based
on the 80/80 criteria, the researchers presented the results of
analyses for performance from a sample of 15 students as
shown in table 1

No	Percentage points Pre-school quiz scores	Percentage points Post-study quiz scores
1	75.00	90.00
2	80.00	95.00
3	80.00	85.00
4	75.00	80.00
5	80.00	85.00
6	80.00	90.00
7	85.00	95.00
8	75.00	90.00
9	80.00	85.00
10	90.00	95.00
11	90.00	95.00
12	80.00	85.00
13	75.00	80.00
14	80.00	95.00
15	85.00	95.00
E1/E2	E1=80.65	E2=87.34

Table 1: Shows performance based on the percentage scores
of pre- and post-study tests of 15 fifth-graders.

Table 1 presented the performance findings based on
the percentage scores of pre-school test scores and
percentage scores of E1/E2 post-study tests of 15 eleventh
graders showed that finding the effectiveness of online
video media on startup techniques was found to be
effective. According to the 80/80 criteria, E1 is equal to
80.6 5, and E2 is equal to 8 7.3 It was supported in the
study of Rahmatika R. et.al. (2021) regarding the
effectiveness of Youtube as on online learning media that
online video can be used as learning medium that helps
students learn independently but it must be adjusted
accordingly based on the material, age, and psychological
development of students so that it would be easier for
learners to understand the topic being presented. Therefore,

the use of online video is effective in the online learning
process.

4. The results of the analysis can be presented, comparing
the scores between classes and after as shown in table 2

Experiment	N	$\bar{x}$	S.D.	t	p
After learning about video media	15	17.87	1.13	7.59	.001
Before learning with video media	15	16.13	.99		

*p<05
  Table 2. Comparison of scores during and after learning video
media on start-up techniques

Table 2 showed the comparative scores between class
and after class with online video media on start-up
techniques. Found that scores before learning with video
media averaged 16.13 and scored after learning with video
media. The average was 17.87 when comparing post-study
trial results significantly higher than before class.
Statistically, at .05, the results of the analysis of learners'
satisfaction with online video media were not available.

The analysis results of analysis of learner satisfaction
with online video media on startup techniques for 15
persons. Learner's satisfaction with online video media for
start-up techniques the 15 students were found to have the
highest overall satisfaction in all areas, equal to 4.56, with
an overall average of 4.47, with the highest average issue
being content from online video media. There is new
content to learn and develop in short runs at the highest
level of 4.53, second only to online video content. It can be
implemented manually, at a level as much as 4.47, and the
content from online video media is clear and easy to
understand, as high as 4.40, respectively. In terms of video
media presentation, the total average was 4.56, with the
highest average point being that the quality of the
soundtrack in the video media was clear. And the font style,
font size, and color are clear. The image presented in the
video media is clear and easy to understand, and the video
media is the most attractive, 4.53 for the activity side with a
total average of 4.66. Able to learn and act practically at
the highest level, equal to 4.80, second only to starting
skills activities. Enhancing knowledge, understanding, and
activities can be learned at any time, and overall satisfaction
with video media is at the highest level, equal to 4.60. It
was highly supported by the research conducted by
Carmichael M. et.al (2014) on their study Assessing the
Impact of Educational Video on Student Engagement,
Critical thinking and Learning; The current state of play.
Their relevant findings are Video provides great benefits to
teachers and learners, stimulating stronger course
performance and affecting student motivations, confidence
and attitudes. Videos with an instructor's image are more
engaging and students engage more with course content.
However, an appropriate balance is needed to ensure
instructor presence is not distracting while allowing for the
inclusion of appropriate social cues.

IV. CONCLUSIONS

The researchers looked for research-related data before conducting analysis and synthesis, with consultants and experts in each area recommending it, as a result, the work was done with satisfactory experiments. Here are the summary:

1. Online video media on starting techniques for eleventh graders exceeded the required threshold of 80/80 with an average of 80.65 /8 7.34, indicating that the video media created by the researchers was effective and appropriate to use in learning management. In terms of content and language, it has passed the review of information from content experts. Overall, experts have a very high level of opinion: structure, accuracy, suitability, and clarity. There is an easy understanding of the content, the suitability between the content and the illustrations, and the appropriateness of the language and the learner level. For media quality, experts have a high level of opinion on language, sound, and screen design, which are consistent with Napaporn Panyakul and Philaephan Pukhut (5), who discussed the value and benefits of teaching materials as being able to offer images and sounds from other media used in almost any teaching situation, which makes the teaching program more interesting and compelling.

2. Online video learning results on starting techniques for eleventh graders after studying are statistically significantly higher than before classes at .05, as students have a clearer understanding of the content from the video media and can see caption illustrations along the way, which according to Vachira Inudom (6), he has mentioned the value and benefits of video that can slow the image moving fast or stagnant or even show continuity processes. There is a sequence of steps at the time of need. By filming techniques and editing techniques, it attracts the attention of the audience.

3. The satisfaction of eleventh graders are at the highest level. The point of presenting the highest average video media is that the quality of the soundtrack in the video media is clear. And the font style, font size, and color are clear. In line with the study of Pratin Leknak (7), he outlined the advantages and benefits of the video system as appropriate for use in the field of education. Not only that, it is also effective in medical, industrial, and others.

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The efficiency of online gamification to enhance basic English of grade 4 students

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Abstract: The objectives of the study were to 1) develop online gamification with the use of online digital learning platforms in teaching English for Grade 4 students, depended on $E_1/E_2 = 80/80$ efficiency criterion as subsequently defined, 2) compare the students' achievement test in learning Basic English through online gamification, 3) determine the students' satisfaction in using online gamification in learning Basic English.

This study's sample was 30 grade 4 students studying at Settabutr Upathum School in the academic year 2022. It was obtained employing purposive random sampling. The research instruments were 1) online Zoom classes to enhance the English skills of grade 4 students of Settabutr Upathum School, 2) lesson plans for the guideline to enhance the English language, and 3) interactive learning platforms to practice students' lesson acquisition, and achievement test for grade 4 students who have learned through online gamification platforms to enhance their Basic English skills. The statistics used in the study were mean standard deviation and t-test for the dependent sample.

The result indicated that the value of efficiency of E1/E2 was 70.00/69.00, which did not meet the 80/80 criteria. Some factors can be considered due to the vast macro skills being tested using the digital media and not only limited to the cognitive skills of the students that could influence the lowering of the set criterion. It was also found that comparing the learning achievements in learning basic English of grade 4 students who learned with the use of online gamification resulted in students' higher scores in learning achievement tests at a significant level of 0.05. Finally, the students' satisfaction level using the online gamification was at good level in learning basic English.

Index Terms— Efficiency, Enhance Basic English, Online gamification

I. INTRODUCTION

In today's global world, language is very significant in relaying information. It is the pathway to convey our ideas and express our feelings, views, and thoughts. Among all the languages globally, the English language is undeniably the most significant common language spoken universally (Nishanti, 2018). He accentuated that knowledge of English is necessary if one wants to come up in life. It is the primary window of the modern world.

English has become the most commonly spoken language and is typically considered the most influential language for establishing global communication. Pratt (2009) remarks that English proficiency is becoming a requirement for success in the interconnected world. There are several areas where the usage of English has been established. Based on Alfitri's (2012, as cited in Reddy, 2016) research, it proved that on the internet, more than 80% of the online sites use the English language as a medium of instruction while about 20% use other languages which are Indonesian, Chinese, and others. It indicates that if people do not learn English as their second language, they will only acquire less than 20% of the new knowledge, for nowadays, new knowledge is mainly shared through the internet.

However, Tsai (2009) indicates that a drastic change during the past decade that occurred noticeably in teaching and learning is using digital and electronic tools. English has increasingly dominated international communication and information access.

At present, teaching has evolved drastically as the world developed technologically. Technology becomes a vital factor, and with each passing day, new soft-wares or gadgets are being brought into the market that serves to advance people's lives in one way or another and make it much easier to incorporate in teaching languages. Technology also allocates support and conditions by escalating freedom of choice, scheduling flexibility, authentic materials, and electronic communication. Ghavifekr and Rosdy (2015) clarify that technology is a significant issue in many fields, including education. Educators used technological resources in their classes in the form of online games. Online gamification arises to the point that it has been adopted in education. The concept of games has changed from self-entertainment into edutainment through adjustments and modifications. Educators in developing countries such as Poland, China, and the US enhance their English classes with surprisingly ensuing positive results (Rothwell & Shaffer, 2019) adapt this notion. They found out that there are several

benefits in incorporating games in learning, and these include motivation improvement, promoting positive attitudes and better performances, fostering 21st-century skills and better cognitive achievements, encouraging social interaction and independencies, and improving competitiveness among students during the learning process (Rahmani, E.F. 2020).

In the emergence of the technological era, several problems hinder the teaching and learning process. Common problems with teaching and learning English as a foreign language are keen to build links between students and teachers. Therefore, it should be discussed and considered by teachers. Kannan (2009) points out that some problems are concerned with teaching methodology. Teachers are having difficulty adapting to the new mode of learning, which is teaching online. They have a hard time changing the teaching methods from traditional to modern ones. Ruso (2007) stated that spending a significant amount of time giving a lecture makes students lose their passionate interest, and they become essentially passive students during their learning process, mainly if it is conducted online. Learning online has downsides for students. In the virtual classroom, they are very distracted and will not pay any attention to the teachers.

Using a computer in the educational process, achieve optimistic attitudes and trends, decrease the learning time, expand the problem-solving skills, implement many challenging tasks, apprehend concepts, memorize historical facts and reduce the workload of both students and teachers. However, the present study also covers the different online digital platforms available for students learning online. Online learning games will help teachers get the students' attention and make them more in engage in the virtual classrooms. These are Kahoot, Quizzis, Word wall, Live worksheets, and more.

Therefore, based on the information above, the researcher needs to conduct a study about the Efficiency of Online gamification in learning English for grade 4 students to benefit from effective teaching in the future.

II. Data used

The researcher conducted the research by undergoing the following procedures; introduced students to online gamification using the Quizzis, Kahoot! Wordwall!, Liveworksheets, ISL Collectives and other online gamification platforms to enhance Basic English of grade 4 students of Settabutr Upathum School, Bangkok Thailand, provided students a pre-test in order to obtain the scores, conducted the learning activities with students by utilizing the lessons through the websites, gave students a post-test after they studied with the digital platform, and collected the score to analyze by applying statistical methods, had students complete the questionnaires on students' satisfaction towards digital media using online gamification to enhance Basic English of grade 4 students.

III. Methodology

This study will use an experimental research design. It is experimental because it aims to test the accuracy of the online gamification using digital platforms by determining if the research instrument is efficient in learning basic English

of grade 4 students. For this experimental model, the researcher carries out the study on the population and sample groups by applying pre-test and post-test (One Group Pre-test – Post-test Design) as follows:

Sample	Pre-Test	Activities	Post-Test
A	X_1	Y	X_2

A Sample Group
X_1 Measurement of pre-test score
Y. Instructional activities using online gamification through online digital platforms to enhance basic English
X_2 Measurement of post-test score

IV. Results and discussion

The results of the study showed that the evaluation of the efficiency of online gamification for learning Basic English through the comparison of their ongoing and post test scores is significantly developed. The ongoing score has a mean score of 49.00 and has a post-test mean score of 38.90 which implies a significant improvement on the usage of online gamification for learning basic English of grade 4 students. The table also showed the efficiency of process (E1) of 70.00 and the efficiency of product (E2) of 69.00. Thus, it's efficiency amounts to 70.00/69.00 which did not meet the 80/80 criteria. Some factors can be considered due to the vast macro skills being tested using the digital media and not only limited to the cognitive skills of the students that could influence the lowering of the set criterion. In addition, the methods used in this study is reliable as it is highly supported in the study of Bamroongkit et.al (2021) on the development of online global Englishes-based listening materials to enhance Thai learners' listening comprehension on a 70/70 set criteria which resulted to an efficiency score of 72.63/71.47. Hence, the instructional media used in this study has to be improved and modified.

Items	n	$\bar{X}$	Percentage	S.D.	Standard	E_1/E_2
Ongoing score	70	49.00	70.00	13.15	80	70.00
Post-test score	56	38.90	69.00	9.63	80	69.00

Fig. 1. Evaluation of the efficiency of online gamification for learning Basic English.

The construction of the experiment on learning basic English using online gamification of grade 4 students of Settabutr Upathum School, Bangkok Thailand was divided into 3 stages in order to test if the value of efficiency of E_1/E_2 according to the 80/80 efficiency criteria could be achieved prior to the implementation. The first stage called individual tryout, the web-based lesson English reading comprehension was trialed with 3 students. In the second stage it was called small group tryout. After the content of this web-based

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instruction was revised and improved, the last stage called field testing was conducted. This was conducted with 30 students. The results revealed that the value of efficiency of E_1/E_2 was 70.00/69.00 which did not meet the 80/80 criteria. The result of this study was opposed to the findings of Wootipong (2013) in his study about the development of web-based instruction in English paragraph writing for undergraduate university students which revealed that the efficiency value was 80.02/80.38. In addition to above-mentioned study, Belardo (2017) also demonstrated that the efficiency of the developed critical reading web-based instructional model was 81.10/80.00. Some factors can be considered due to the vast macro skills being tested using the digital media and not only limited to the cognitive skills of the students that could influence the lowering of the set criterion. This is highly supported in the study of Bamroongkit et.al (2021) on the development of online global Englishes-based listening materials to enhance Thai learners' listening comprehension on a 70/70 set criteria which resulted to an efficiency score of 72.63/71.47.

Moreover, the efficiency of the online gamification to enhance Basic English of grade 4 students through the comparison of their pre-test and post-test scores is statistically significant. It clearly showed that the students' scores after the intervention of the online gamification activities ($\bar{x}$=29.03, S.D.= 8.34) was higher than that before the intervention $\bar{x}$=23.00, S.D.= 6.42.) The t-test analysis before and after the treatment was 7.435 which is statistically significant at the 0.05 level.

Items	n	$\bar{X}$	S.D.	t-test	Sig. (2-tailed)
Pre-test	30	23.00	6.427		
Post-test	30	29.03	8.348	7.435	.000

Fig. 2. The comparison of average score before and after learning English using Online gamification at 0.05 level of significance.

Based on the comparison between the learning achievements on learning Basic English of grade 4 students who learnt with the used of online gamification, the result showed that students had higher scores in learning achievement tests at a significant level of 0.05. In the same study conducted by Flores (2015), he accentuated that the usage of e-learning platforms such as Duolingo, Class Dojo, Edmodo and etc. bravely claimed a 9% improvement on the students' performance and a decrease of 16% of failing students. Asmara, et.al (2022), also found out that the students who at a frustration reading level had reached instructional reading level after immersion of online gamification. Learning with these digital media produced significant results in relation to the content and curriculum that is fitted to the grade 4 students. This was because the digital media enhances motivation, promotes optimistic behavioral attitude and better performances that keeps abreast with the 21st century skills needed in the academe. This is highly supported in the study conducted by Sartini (2020), when he found out that the use of Kahoot! made learning experience in the classroom interactive, interesting and effective due to the cycles of ascending progress done by the maritime students in their English oral reproduction and vocabulary. Also, this was supported in the study about the effectiveness of quizzis in interactive teaching and learning Malay grammar by Husain, et.al (2021) that using quizzis as a formative assessment tool is imperative as it allowed students to warm up the material and receive momentary inputs to their level of control. Moreover, Basuki, et.al (2019) reinforced that the usage of Kahoot! and Quizzis as digital media instruction are found to be effective as it fostered a competitive atmosphere.

Finally, the students' satisfaction level using the online gamification was at good level in learning basic English. The result showed that the satisfaction survey on the application of online gamification in the teaching learning process. Its average mean stands at 4.22 and standard deviation reached 0.17 which showed that students had a good satisfaction in learning basic English through online gamification. The mean scores ranged between 4.20 and 4.80, which was between good and very good levels. The highest satisfaction is on the usage of online gamification in terms of the online gamification platforms' instructions are easy to use with a mean of 4.80 and a standard deviation of 0.40. It is followed by the evaluation in terms of pre-test and post-test offer students the understanding on the contents appropriately with a mean of 4.73 and standard deviation of 0.44. Conversely, the interactive functions between users and instructional contents is effective has the lowest mean score of 4.20 and a standard deviation of 0.55.

Evaluation Items		$\bar{X}$	S.D.	Result Interpretation
Contents				
1.1	The learning contents are suitable with the learning time defined.	4.43	.50	High
1.2	The learning topics and contents are interesting.	4.56	.50	Very High
1.3	The demonstrated contents cover the learning objectives of each chapter.	4.40	.49	High
1.4	The learning contents are appropriate for the students' grade level.	4.50	.50	High
1.5	The learning contents are clearly explained and enough for understanding.	4.46	.50	High
1.6	Question items in the unit exercises are relevant to the content.	4.46	.50	High
1.7	The contents of 3 chapters are appropriate for learning using online gamification.	4.60	.49	Very High
1.8	The unit exercises are sufficient for checking understanding.	4.33	.54	High
1.9	The question items in the unit exercises are clearly stated and easy to understand.	4.63	.49	Very High

Screen Design

2.1	Layout of each page is established appropriately for learning.	4.46	.50	High
2.2	Choices of typeface and size facilities ease of use.	4.63	.49	Very High
2.3	A loud and clear sound is provided.	4.63	.49	Very High
2.4	Interaction and timely feedback are provided appropriately.	4.50	.50	High
2.5	Choices of color is appropriate.	4.56	.50	Very High
2.6	Screen design is attractive to students.	4.63	.49	Very High
2.7	Lesson navigation and buttons are appropriately established and relevant to online gamification.	4.40	.49	High

Usage of Online Gamification

3.1	The online gamification platforms' instructions are easy to use.	4.80	.40	Very High
3.2	The interactive functions between users and instructional contents is effective.	4.20	.55	High
3.3	Learners can control and use these online gamification platforms on their own.	4.70	.46	Very High
3.4	User's manual clearly describes how to use online gamification platforms.	4.53	.57	Very High
3.5	These online gamification platforms are fun and interesting.	4.50	.50	High
3.6	Specific time for learning these online gamification platforms are appropriate.	4.40	.49	High
3.7	If it is possible, you would like to learn other subjects with these online gamification platforms.	4.60	.49	Very High

Evaluation

4.1	Pre-test and post-test offer students the understanding on the contents appropriately.	4.73	.44	Very High
4.2	The question items are clear.	4.56	.50	Very High
4.3	The tests are made with the objectives and media.	4.53	.57	Very High
4.4	The difficulty of the test is appropriate for students.	4.33	.54	High
4.5	The score between pre-test and post-test is clear.	4.66	.47	Very High
	Total	4.22	.17	High

Fig. 3. The students' satisfaction towards learning English through online gamification.

Based on the results of this study towards learning basic English through the used of digital media, it has been found that students had good satisfaction towards learning Basic English through online gamification. This was aligned in the study of Jitsupa et.al (2022) that resulted with a high students' satisfaction level of online gamification teaching for the digital literacy course. This established that the students were highly satisfied with the learning activities and high level of learning motivation that online gamification provided. This was also proven that Kahoot! and Quizzis were engaging, addicting and motivating that showed a favorable attitude for students to learn and achieve more on the intended learning outcomes of the lesson (Basuki and Hidayati, 2019). This was also stressed in the study of Suo Yan mei et.al (2018) that 60 % of students agreed that digital media such as Quizzis made them competitive in learning Arabic class that stemmed to an active participation and more concentration to the topics discussed.

V. CONCLUSION

The results of this study showed that the efficiency of online gamification on learning basic English demonstrated that the coefficient of E_1/E_2 as the score during the learning process (E_1) was equal to 70.00, and the score of performance (E_2) was equal to 69.00, which was lower than the standard criteria 80/80 defined. It clearly showed that the use of online gamification to enhance Basic English of grade 4 students of Settabutr Upathum School, Bangkok Thailand had low efficiency. Also, the result of students' learning achievement with the usage of online gamification to enhance Basic English of grade 4 students of Settabutr Upathum School, Bangkok, Thailand illustrated that students' scores on post-test were higher than that of pre-test at a significant level of 0.05. Lastly, the result of the students' satisfaction scores presented a good level of satisfaction towards learning basic English using online gamification platform which contained mean score 4.22, especially in terms of easy usage of online gamification platforms' instructions.

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Development of Online Lesson to Enhance Mathematics Achievement for Grade 3 Students

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Abstract: A key issue involves the factors motivating the adoption of the web for learning. Using web technology in education can influence learning behavior by providing an effective learning environment that encourages active participation, and offers opportunities for responsive feedback and individual involvement. The objectives of the study are to compare the before-study and after-study test scores of grade 3 students using online lessons and measure the level of satisfaction with the development of online lessons to enhance mathematics achievement for grade 3 students. The population of the study is all grade 3 sixty-two (62) grade 3 students who were in the academic year 2022 at Nakornnon Wittaya 5 Tarmsumrit School in Nonthaburi, Thailand.

This study will use a quasi-experimental research design. It will follow a rigid scientific research design because it will involve testing to prove a hypothesis through experimentation. The researcher will use online lessons using wordwall to enhance mathematics academic achievement for grade 3 students. Results revealed that after-study test scores of the development of online lessons to enhance mathematics achievement of grade 3 students were higher than before-study test scores. Moreover, results showed that the grade 3 students' level of satisfaction with the development of online lessons to enhance mathematics achievement had a computed grand mean of 3.904 with a verbal interpretation of "agree".

For recommendation, teachers must design relevant learning activities such as online discussions to realize their goals, aspirations, and interests. They may also apply internet-based applications that could expand the learners' opportunities to collaborate in pair work and group work and develop their independent learning because they can learn at their speed and time.

Index Terms— online lesson, mathematics achievement, wordwall

I. INTRODUCTION

In organizing the learning process, the educational institutes and agencies concerned need to provide substance and arrange activities in line with the learners' interests and aptitude, bearing in mind individual differences. Teachers must change their role from that of the informer to that of facilitator. Learners will need to reach out more on their own given a basis which includes knowledge on how to learn, where to get information and how to make use of it. In doing so, both learners and the teachers may learn together through the use of different types of teaching-learning media and other sources of knowledge (Saowapon et al., 2021).

This gave birth to e-learning which has moved education in the direction of learner-centered learning and can be facilitated most anywhere and at any time with adequate computer facilities and access. E-learning can perhaps be a part of the educational reform in Thailand. In Thailand, E-learning is in the early stages of development so quality assurance mechanisms concerning the educational process still only cover existing teaching-learning methods and are primarily based on classroom teaching. The hope is that E-learning will be used widely and within a short time appropriate, quality assurance mechanisms will develop in parallel. While a great deal of distance learning will reach out to all of us educators will likely also need to look at E-learning opportunities on campus where traditional instructional methods can perhaps overlap with e-learning techniques and offer the best of both systems.

A key issue involves the factors motivating the adoption of the web for learning. Using web technology in education can influence learning behavior by providing an effective learning environment that encourages more active participation, offers opportunities for responsive feedback and individual involvement, and promotes teamwork through collaborative learning. The transformation from traditional classrooms to online lesson environments has changed learning styles and interactions between instructors and students. It can enable students to communicate electronically and attend courses online. Further, trainers can

work in cyberspace to improve educational inputs, processes, and outcomes. The growth of web applications has made the web an essential educational medium (Rane, V., & MacKenzie, C. A. 2020).

Online teaching and learning are all about making connections: connecting your students and to resources around the globe; combining different types of materials – music, motion, text, narration – into one presentation; collecting related information from multiple sources, enabling students to make their connections by introducing materials to download and to be used in their scholarship or by having them construct web documents as part of their coursework. And this process of making significant connections is at the core of all learning, Javed Wasim (2014). Furthermore, many research studies have been carried out on online learning to explore student satisfaction, acceptance of e-learning, distance learning success factors and learning development (Yen et al., 2018).

Moreover, the two factors that affect learning outcomes in online mathematics courses are the display of the mathematical concepts, problems, and process steps of the solutions and the practical realization of the student-teacher interaction. Learning about mathematical thinking, logical inference, and discussion of alternative solutions via student-teacher interaction constitutes the basic principles of mathematics education. In addition, for doing mathematics, writing is a must that emphasizes mathematical thinking through the semiotic coordination of speech, body, gestures, symbols, and tools (Karal, 2013).

By providing and giving students with a personalized learning resource, online learning allows learners to dynamically adjust the learning process based on their skills and previous knowledge, considering the level and type of teaching. Moreover, online lesson learning can increase students' mathematics performance due to providing feedback to students in this environment. Since online learning offers individuals the opportunity to access the learning resource at their convenient time, individuals can advance the learning process at any desired pace, cease their education at any time, and repeat parts of the learning section (Hillmayr et al., 2020)

From the background and problem statement of the study, the researcher has observed that the Grade 3 students have difficulty understanding mathematical concepts, making them unable to retain learning necessary or requisite to the next subject matter since mathematics by nature follows a spiral progression. Hence, the researcher would like to embark and get interested in proposing and studying the development of online lesson to enhance mathematics achievement of grade 3 students that is hoped to ensure high performance in mathematics.

II. DATA USED

The online lesson was develop via zoom platform integrating wordwall application to enhance mathematics achievement for grade 3 students of Nakornnon Wittaya 5 Tarmsumrit School, Nonthaburi, Thailand. Develop online lesson using wordwall application with the flow charts and storyboard of the lessons and the priority of the content from lessons and activities.

The researcher develop achievement paper for grade 3 students after the online lessons by creating some questions or test related to the topic they had discussed. Then the students' learning will be tested depends on the result of the achievement paper. They were administered with the before study and the after-study test which both measured the development on online lessons and develop Satisfaction questionnaire by creating multiple questions related the effectiveness of online lesson and the grade 3 students who have learned by using online lesson fill up the satisfaction questionnaires.

III. METHODOLOGY

This study will use an experimental research design. It is experimental because it aims to test the accuracy of the usage of online lesson using Wordwall application by determining if the research instrument causes an effect on the achievement of grade 3 students in Mathematics. For this experimental model, the researcher carries out the study on the population and sample groups by applying pre-test and post-test (One Group Pre-test – Post-test Design) as follows:

Sample	Pre-Test	Activities	Post-Test
A	X_1	Y	X_2

A Sample Group

X1 Measurement of pre-test score

Y Online learning activities integrated in the lesson through wordwall to enhance mathematics achievement

X2 Measurement of post-test score

IV. RESULTS AND DISCUSSION

The results of the study showed that the Grade 3 students performed better in the after-study test as evidenced by the means, standard deviation and the results of t-test for dependent samples. Furthermore, it revealed that the after-study test scores of developments of online lesson to enhance their Mathematics achievement was significantly higher than the before study test scores as evidenced by the p-value of 0.000 statistically tested at 0.05 level of significance. This implies that use of online lesson brings effectiveness and was helpful among Grade 3 students.

Figure 1. Comparison of the development of online lesson to enhance Mathematics achievement of Grade 3 students

before study and after study test scores learning activity through online lesson.

Development of Online Lesson in Mathematics	n	Mean	S.D.	t-value	df	p-value
Before Study	16	27.625	5.818	9.4423*	15	0.0000
After Study	16	33.6875	3.683			

From the figure 1 the results revealed that after study test scores of the development of online lesson to enhance Mathematics achievement of Grade 3 students (= 33.6875, s = 3.683) was higher than their before-study test scores (= 27.625, s = 5.818).

Meanwhile, p-value of 0.000 is less than the 0.05 level of significance which leads the researcher to reject the null hypothesis that the after-study test scores were significantly higher than the before study test scores of Grade 3 students who learned using online lesson to enhance their Mathematics achievement.

This only implies that the after-study test scores of the development of online lesson to enhance mathematics achievement of grade 3 students were significantly higher than the before study test scores at 0.05 level of significance which means to say that learning using online lesson in mathematics is desirable among grade 3 students.

The result is supported by the study of Agarwal & Kaushik, (2020), that his study findings indicated that instructor's quality is the most prominent factor that affects the student's satisfaction during online classes. This means that the instructor needs to be very efficient during the lectures. He needs to understand students' psychology to deliver the course content prominently. If the teacher can deliver the course content properly, it affects the student's satisfaction and performance. The teachers' perspective is critical because their enthusiasm leads to a better online learning process quality.

In addition, in the present article, we investigate how school closures in 2020 influenced the performance of German students in a curriculum-based online learning software for mathematics. We analyzed data from more than 2,500 K-12 students who computed over 124,000 mathematical problem sets before and during the shutdown, and found that students' performance increased during the shutdown of schools in 2020 relative to the year before. Our analyses also revealed that low-achieving students showed greater improvements in performance than high-achieving students, suggesting a narrowing gap in performance between low- and high-achieving students. We conclude that online learning environments may be effective in preventing educational losses associated with current and future shutdowns of schools (Musslick, (2020).

The result in figure 1 is supported by the study of Yanto, (2021). His study aims to discover the effectiveness of the blended learning model in mathematics learning to improve the achievement of mathematical concepts. His study employed a quasi- experimental design with a non-equivalent control group. The experimental class was taught through blended learning, while the control class was taught through the conventional learning model. The population of this study was the students at State Senior High School 1 Sewon Yogyakarta, Indonesia. The research sample involved 60 tenth-grade students in the 2019/2020 academic year, 30 students in each of the experimental and control groups. The sampling technique used cluster sampling and the data were collected using a test instrument. The validity of the test was measured using the obtained Aiken index (0.80), and the reliability was based on the Cronbach's alpha coefficient (0.86). The data were analyzed using t-tests and descriptive statistics. The results of this study showed that the blended learning model is significantly more efficient and effective than the conventional learning model in enhancing students' achievement of mathematical concepts. This means that the application of blended learning in mathematics learning can significantly improve students' achievement of mathematical concepts.

Figure 2. Analysis Results of the satisfaction of Grade 3 students on the development of online lesson to enhance Mathematics achievement

Indicators of the Level of Satisfaction on Online Lesson	Mean	Verbal Interpretation
1. I have understood the topics easily.	3.875	Agree
2. I have solved the mathematical problems faster.	3.4375	Agree
3. I have enjoyed mathematics because of Wordwall game.	4.625	Strongly Agree
4. I am happy while learning mathematics online.	4.25	Strongly Agree
5. I have difficulty focusing in the discussion.	3.0625	Neutral
6. I am more comfortable solving problems using the Wordwall game.	4.4375	Strongly Agree
7. I can immediately see if my answers are correct or not in Wordwall.	4.375	Strongly Agree
8. I felt that I am part of the class and that I belong to the online session.	4.4375	Strongly Agree
9. I can review the problems and study it with my parents/siblings/tutor any time.	3.9375	Agree
10. I became more participative and confident in class.	4.5	Strongly Agree
11. I cannot solve the math problems at my own pace.	2.6875	Neutral
12. I always feel excited to do activities in Wordwall.	4.3125	Strongly Agree
13. I want to take more online classes in the future.	3.875	Agree
14. I am shy to ask questions to my math teacher.	2.5	Disagree
15. The teacher can respond quickly every time we ask questions.	4.25	Strongly Agree
Grand Mean	**3.904**	**Agree**

Figure 2 presents that the statement "I have enjoyed mathematics because of wordwall game" had a computed mean of 4.625 and is verbally interpreted as strongly agree while "I became more participative and confident in class" obtained a mean of 4.5 and is verbally interpreted as strongly agree. "I am more comfortable solving problems using the wordwall game" and "I felt that I am part of the class and that I belong to the online session" shared an equal mean of 4.4375 and are both interpreted as strongly agree while "I can immediately see if my answers are correct or not in wordwall" had a computed mean of 4.375 and is verbally interpreted as strongly agree. "I always feel excited to do activities in wordwall" obtained a mean of 4.3125 and is verbally interpreted as strongly agree while "I am happy while learning mathematics online" and "The teacher can respond quickly every time we ask questions" shared a computed mean of 4.25 and are verbally interpreted as strongly agree. "I can review the problems and study it with my parents/siblings/tutor any time" garnered a mean of 3.9375 and is verbally interpreted as agree while "I have understood the topics easily" and "I want to take more online classes in the future" shared a computed mean of 3.875 and are verbally interpreted as agree. "I have solved the mathematical problems faster" obtained a mean of 3.4375 and is verbally interpreted as agree while "I have difficulty focusing in the discussion" had a computed mean of 3.0625 and is verbally interpreted as neutral. "I cannot solve the math problems at my own pace" garnered a mean of 2.6875 and is verbally interpreted as neutral while "I am shy to ask questions to my math teacher" had a computed mean of 2.5 and is verbally interpreted as disagree.

Overall result revealed that the grade 3 students' level of satisfaction on the development of online lesson to enhance mathematics achievement had a computed grand mean of 3.904 with a verbal interpretation of "agree".

The result is supported by the study of Kawas, (2021) that online learning has become the new normal in many medical and health science schools worldwide, courtesy of COVID-19. Satisfaction with online learning is a significant aspect of promoting successful educational processes. This study aimed to identify factors affecting student and faculty satisfaction with online learning during the new normal. Online questionnaires were emailed to students (n = 370) and faculty (n = 81) involved in online learning during the pandemic. The questionnaires included closed- and open-ended questions and were organized into two parts: socio-demographic information and satisfaction with online learning. Descriptive statistics were used to analyze the responses to the satisfaction scales. Students' and faculty responses to the open-ended questions were analyzed using the thematic analysis method. The response rate was 97.8% for students and 86.4% for faculty. Overall satisfaction among students was 41.3% compared to 74.3% for faculty. The highest areas of satisfaction for students were communication and flexibility, whereas 92.9% of faculty were satisfied with students' enthusiasm for online learning.

V. Conclusion

Results revealed that after study test scores of the development of online lesson to enhance mathematics achievement of grade 3 students was higher than their before-study test scores. Also, the researcher rejected the null hypothesis at 0.05 level of significance concluding that the after-study test scores were significantly higher than the before-study test scores of grade 3 students to enhance mathematics achievement using online lesson.

This conclude that the entire learning material for mathematics is delivered on our online learning platform effectively and help them learn faster and with more understanding.

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Systematic Literature Review of the Importance of Safety Culture on Aviation Safety Management Systems (SMS)

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Abstract: Safety, and by extension, safety management systems (SMS), are increasingly popular notions and practices in various industries, including aviation. ICAO recommends that every aviation service provider implement an SMS within the appropriate framework and commensurate with the size and complexity of its products. To help the implementation of the SMS successfully, understanding the importance of the safety culture within an organisation support the management in identifying needs and designing an SMS programme more effectively. A detailed and structured literature review was performed and indicated that safety culture was a fundamental for the proper running of organisational operations. Since culture is a concept that people can transfer from time to time to various groups, the best definition is shared values, practices, attitudes, and beliefs that govern how an organisation functions. Thus, the organisation's success partly rests on its ability to emphasise safety issues by ensuring its employees' perceptions. An institution that emphasises and supports a safety culture is likely to minimise the potential risks associated with human mistakes that may result in disasters of greater magnitude.

Index Terms— **Safety Management System, Aviation, Safety Culture, SMS**

I. INTRODUCTION

The aviation industry is one of the most regulated industries in the world and is subject to many safety regulations and standards. It involves many stakeholders, including airlines, airports, and other aviation-related organizations. Airlines, airports, and other aviation businesses progressively use safety management systems (SMS) to guarantee that safety procedures are maintained and enhanced. SMS is a systematic strategy for controlling safety hazards, including organizational structures, accountability, policies, and procedures. The major goal of SMS is to minimize the number of aviation accidents and incidents.

Safety culture is also an important factor in aviation safety. It is described as an organization's shared values, beliefs, and practices that create a safe and secure environment. A strong safety culture increases personnel's safety awareness, improves safety performance, and improves safety outcomes. This paper will examine the relationship between SMS and the perceived safety culture of aviation personnel. It will begin by discussing the SMS concept and its importance in the aviation industry. It will then go into aviation safety culture and the significance of having a strong safety culture. Lastly, the article will explore the link between SMS adoption and aviation personnel's perceived safety culture.

II. LITERATURE REVIEW

A. Safety Management Systems Concept

Safety Management Systems (SMS) are designed to provide an effective safety management system, enabling organizations to systematically identify, assess, and manage hazards and risks in the aviation environment. The International Civil Aviation Organization (ICAO) defines SMS as "a formalized system developed to manage risks in aviation operations systematically" (ICAO, 2016). SMS aims to ensure that safety is integrated into the organization's day-to-day operations and that all personnel is aware of their safety responsibilities. ICAO Annex 19 outlines the requirements for implementing an SMS, which includes identifying safety hazards, developing safety policies and procedures, implementing safety management processes, and monitoring and evaluating safety performance. Similarly, ICAO defines safety management as "the systematic application of management principles and practices to achieve safety objectives" (ICAO, 2016). SMS is, therefore, a complete and systematic approach to safety management. It comprises the organizational structures, accountability, policies, and processes for dealing with safety concerns. The primary goal of SMS is to incorporate safety into all elements of aviation operations, including risk management, policy creation, and execution of safety management processes (Adjekum & Tous 2020). Furthermore, SMS encourages the development of a safety culture within the aviation community, which is critical to the continuing safety of aviation operations.

SMS strives to minimize the number of aircraft accidents

and mishaps. It is founded on the risk management principle, which entails identifying possible hazards, analyzing the risks connected with them, adopting risk-reduction measures, monitoring the efficacy of the measures, and taking corrective action when required (Kin, 2015). SMS helps identify potential risks and implement measures to reduce the likelihood of an accident or incident (İnan & Bükeç 2020).

B. Safety Culture in Aviation

Safety culture is an important element of aviation safety management and can be defined as the degree to which safety is valued and prioritized within an organization. It is based on the personnel's attitudes, values, and beliefs and is manifested in the behaviors and actions of the personnel. The importance of a safety culture in efficiently using SMS has been emphasized. The personnel must be aware of the safety risks and willing to take the necessary actions to manage them. A strong safety culture is one in which safety is a priority for everyone in the organization, from the senior management to the frontline staff. It is also one in which safety is seen as a core value rather than something that is "done" or "enforced."

Safety culture has been shown to have a direct impact on safety performance. It has been found that organizations with a strong safety culture have fewer accidents and incidents and that safety is more likely to be taken seriously by personnel (Kin, 2015). A strong safety culture encourages personnel to report incidents and hazards and to take proactive measures to prevent accidents and incidents.
Safety culture is affected by several factors, such as organizational culture, leadership, safety climate, and safety policies and procedures. Organizational culture refers to the values and beliefs of an organization, which can influence the attitudes and behaviors of personnel. Leadership is also important in developing a safety culture, as it can set the tone for the organization and provide guidance and support to personnel (Adjekum et al., 2016). Safety climate refers to the perceptions and beliefs of personnel regarding safety in the organization, and safety policies and procedures are essential for successfully implementing a safety management system.

III. Relationship between SMS implementation and Safety Culture

Safety culture plays an important role in the effective implementation of SMS, and the relationship between SMS implementation and the perceived safety culture among aviation personnel has been studied extensively. Research has shown that implementing an SMS is associated with greater safety awareness among personnel and a stronger commitment to safety (ICAO, 2016). The research has also shown that implementing an SMS is associated with an improved perception of safety culture among the personnel. The personnel are more aware of the safety risks and are more willing to take the necessary actions to manage them

(Robertson, 2017). Employees aware of the safety risks and the procedures for managing them are more likely to take proactive steps to reduce the risk of accidents and incidents. It has been found that personnel in organizations with SMS are more likely to report incidents and hazards and that they are more likely to take proactive measures to prevent accidents and incidents (Kin, 2015). In addition, research has shown that personnel in organizations with SMS are more likely to perceive the organization as having a strong safety culture. This is because SMS helps organizations identify and manage safety risks and create a culture of safety shared by all personnel. Employees aware of the safety management processes and procedures are likelier to have a positive attitude toward safety. They are more likely to take personal responsibility for safety, and this can lead to improved safety performance.

However, the effectiveness of SMS implementation is also dependent on the quality of safety policies and procedures and the commitment of personnel to the safety process. If the policies and procedures are inadequate or not properly implemented, the perception of safety culture among personnel may be negative (Robertson, 2017). Additionally, the SMS may be ineffective if the personnel is not committed to the safety process.

IV. Discussion

The aviation sector is complicated and dynamic, and it must always adhere to safety norms and requirements. Safety Management Systems (SMS) has become essential to aviation safety management. They ensure that the aviation industry complies with safety regulations and standards and that safety management practices are effectively implemented and maintained (ICAO, 2016). Implementing SMS is associated with greater safety awareness among the personnel and a stronger commitment to safety. It is associated with an improved perception of safety culture among the personnel (Adjekum et al., 2016). Research has shown that personnel with SMS are more likely to perceive the organization as having a strong safety culture and are more likely to take proactive measures to prevent accidents and incidents (Stroeve & Kirwan 2022).
Implementing an SMS benefits the organization, enabling it to systematically identify, assess, and manage safety risks. It also provides a framework for developing safety policies and procedures and monitoring and evaluating safety performance (Robertson, 2017). Moreover, deploying an SMS benefits staff by improving their knowledge of safety concerns and readiness to take the required steps to control them. It also contributes to developing a common safety culture among all workers and ensures that safety is taken seriously by everyone in the company. SMS encourages personnel to take ownership of their safety responsibilities and proactively identify and manage safety risks. Furthermore, it allows organizations to demonstrate commitment to safety and to track and manage safety performance.
The perception of safety culture among aviation personnel is closely related to implementing SMS. Employees aware

of the safety management processes and procedures are likelier to have a positive attitude toward safety (Robertson, 2017). Implementing SMS can increase safety awareness among the personnel, leading to improved safety performance.

V. CONCLUSION

Safety management systems (SMS) have become essential to aviation safety management. They ensure that the aviation industry complies with safety regulations and standards and that safety management practices are effectively implemented and maintained. Implementing an SMS is associated with greater safety awareness among the personnel and a stronger commitment to safety. It is associated with an improved perception of safety culture among the personnel. Implementing an SMS benefits the organization, enabling it to systematically identify, assess, and manage safety risks. For the personnel, it increases their awareness of the safety risks and willingness to take the necessary actions to manage them. Research has shown that implementing an effective SMS can positively impact the perceived safety culture among aviation personnel and lead to increased safety performance. Additionally, implementing an effective SMS can lead to improved communication and collaboration between personnel, which can help reduce errors and improve safety performance (Čokorilo Dell'Acqua 2013). Finally, SMS implementation can help reduce the costs associated with safety incidents, leading to increased efficiency and productivity.

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Conceptual Relationship between Transcendental Leadership on Employees' Perceptions of Organisational Justice

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Abstract: This paper aimed to study the conceptual relationship between Transcendental Leadership and Perceptions of Organisational Justice among employees. The transcendental leadership and organisational justice elements were reviewed, hypothesising a likely influential relationship between the two variables. The potential relationship includes Competence, Communication and Employee Participation; Commitment and Work; Gratification; Morals, Ethics and Pursuing Service; and Employee Emotions. Empirical research may be developed from this study to confirm the conceptual relationship model. Discussion and analysis were presented in this paper.

Index Terms— **Transcendental Leadership, Organisational Justice, Employees' Perception, Leadership**

I. INTRODUCTION

The contemporary business environment calls for organisations to develop practical leadership styles that can realise the objectives of the organisation. These goals may include dealing with competition and creating a positive perception of organisational justice among the employees. While aspects of organisational justice are virtually essential in any organisation, this element is majorly influenced by the type of leadership style adopted by an organisation. Most certainly, transcendental leadership affects the personnel's view of organisational justice in different ways. This is crucial since organisational justice features play a pivotal role in the organisation, including ensuring fair treatment of all individuals in a given organisation. This paper peruses to determine the leading influence that transcendental leadership has on the opinions of the employee of organisational justice. Basing on specific insights and assuming a cross-level diversified effect approach, this paper recommends transcendent leadership is a model for crucial responsibilities for strategic managers in current dynamic contexts and a tool to enhance organisational justice.

II. LITERATURE REVIEW

A. Transcendental Leadership

Transcendental leadership was initially familiarised as a worldwide imperative in 2007. This practice steadily progresses into the current century as the primary competitive necessity for organisations across the globe that aim at developing a spiritual workforce while at the same time leading change efficiently. Alexakis (2011) defined transcendental leadership as a style that is directly associated with leaders who emphasise motivating their employees, both extrinsically and intrinsically, and in other situations, transcendentally. These characteristics are greatly emphasised in this leadership style, including the leader's ability to realise goals that are virtually considered impossible and ensure that intangible goals are made tangible. Many researchers and past studies do not highlight crucial dimensions of the elements of spirituality in transcendental leadership, such as hope, vision, altruistic love, and membership, among others that add to positive organisational outcomes like leadership efficacy, organisational commitment, and financial performance (Cardona, 2000)

Leaders who utilise this approach often adopt these features to impact the employee's influence on organisational justice; nonetheless, it is not clear how the leader's actions and attributes could impact their personnel's change and attributes (Alexakis, 2011). Transcendental leadership also involves specific dimensions of spirituality, which includes aspects of faith, moral character, and ethics. These dimensions of spirituality involve the practical managerial elements included in transactional theory and charismatic features of the theory of transformation to improve the effectiveness of a given leader. A demonstration of how organisational leaders adopt this leadership approach in the proportions of spirituality to impact organisational justice and aspects of spirituality to the employees is elusive. In general, transcendental leaders empower, reward, inspire, and lead their workforces,

considering the situation at hand.

Barney et al. (2015) highlight that transcendental leaders evaluate their individual as well as other shareholders' internal and external experiences that often emerge from knowledge and data cycles. This leadership style requires specific skills set to realise organisational objectives and influence employees' perception of organisational justice. One quality is that the leader ought to have unconditional acceptance. In this case, the leader could choose to accept a particular feature either in the employee or organisation but not agree with the specific differences. Reverence is another vital quality of these leaders. Reverence includes how the leader views the organisation and its constituents. A transcendent leader ought to be responsible for the embodiment of the organisation and teach the elements of reverence to all employees, thus, enhancing their opinions of organisational justice. Other essential qualities include the courage to make sensitive decisions, presence, gratitude, and the highest good (Crossan & Nanjad 2008)..

Overall, transcendent leaders are those who can lead within and amongst the levels of self, others, and organization. Although we view the levels as quite synergistic in nature, we anticipate that not all strategic leaders will have the inclination or the capacity to excel at all levels. Individuals will have personal dispositions and face contextual factors that affect their ability to fulfill their responsibilities at the three levels. Some strategic leaders have risen to the top because of their capacity to lead others, but may not be well equipped for leadership of the organization; other leaders may be parachuted into situations where they are expected to make strategic changes, but lack the ability to lead others. In this section, we look at different scenarios of strategic leadership and their implications in terms of firm performance.

B. Characteristics of transcendental leadership

From the planning, organization, coordination, communication, and performance evaluation, and keeping personnel working together, and achieving job satisfaction. By being brave enough to have the initiative to create new things and is a good role model from the courage to think, to make decisions, to have a strong mind, the power of thinking in creating jobs. Srichaiwong and the team (2020) studied the characteristics of transcendental leadership through the collections of qualitative research came from documentary study and interview, quantitative to survey by questionnaire into the data and found that there were four characteristics which include:
(1) Characteristics of Vision refers to the ability to set goals for anticipation through paradigms and the wide vision can lead the subordinate personnel to move forward, and create cooperation for all personnel to achieve their goals for success, increasing the potential of personnel, a support to become a good leader in the future. Including able to transform the vision into real work operations until achieving the most success and building cooperation of teamwork to enable personnel to cooperate, join forces, join

hands and helping with service work as well as allowing followers to open up new ideas. (2) Characteristics of Morals and Ethics refers to the performance of empowered leaders, Fair, honest and have a good governance principles, adherence to accuracy and being faithful including with honesty, responsibility, patience. Understanding and being compassionate, decisions based on good principles and reasons, an expression of sincerity and attention in all the feelings of teamwork. (3) Characteristics of Pursuing Service refers to the ability to focus the common, conducting service as a service provider that aims to manage personnel and others from the attentive service allocate relief and help to get the most benefit, providing assistance and personnel support from being the coordinator in the organization to achieve smooth work and aim for efficiency at work. (4) Characteristics of Leader Competency refers to an ability to formulate strategies for personal and organizational development, the ability to lead oneself, lead others, and lead the organization to be the leader of change as an opportunity, knowing how to find the right change and how to create change effectively.

C. Organisational Justice

Organisational justice theory offers a framework through which to explore and understand employees' feelings of trust or mistrust more fully. Baldwin (2006) categorized and defined organisational justice refers to the extent to which employees perceive workplace procedures, interactions and outcomes to be fair in nature. These perceptions can influence attitudes and behaviour for good or ill, in turn having a positive or negative impact on employee. There are three dimensions including in the organizational justice. (1) Distributive justice This type of justice refers to outcomes being distributed proportional to inputs – the so-called equity principle (Adams, 1965). Outcomes in a work context might take the form of wages, social approval, job security, promotion and career opportunities, while inputs would include education, training, experience and effort. As it can be difficult to determine what constitutes an appropriate level of reward for a particular degree of input, people tend to make this judgement in relative terms, looking for a contribution–outcome ratio that is similar to that of their peers. (2) Procedural justice is concerned with the fairness of the decision process leading to a particular outcome. As just noted, procedural justice can outweigh distributive justice, in that people may be willing to accept an unwanted outcome if they believe the decision process leading up to it was conducted according to organisational justice principles. For example, Greenberg (1994) found that smokers more strongly accepted a smoking ban at their workplace when they felt they had been given thorough information about the change of policy, in a socially sensitive manner (see Internet Resources for more information on implementing a workplace smoking ban). The same principles might apply to the hypothetical promotion scenario given above. An unpromoted worker may be placated if he is convinced that the system used to decide promotions is transparent and free from bias

(3) Interactional Justice: in some respects, interactional justice falls under the umbrella term of procedural justice, but is significant enough to be considered in its own right. It refers to the quality of the interpersonal treatment received by those working in an organisation, particularly as part of formal decision making procedures.

III. RELATIONSHIP BETWEEN TRANSCENDENTAL LEADERSHIP AND ORGANIZATIONAL JUSTICE

Organisational justice integrates the outcomes of organisational change with the methods used to achieve it, and perceptions about the treatment of those affected.

Organisational justice is mostly influenced by the type of leadership utilised in any organisation, irrespective of its size. This concept, initially hypothesised in 1987 by Greenberg, involves the personnel's views of the general behaviours of the organisation, actions, and their decisions and how these elements impact the behaviours and attitudes of the employees at work. Organisational justice is closely related to the conception of fairness (Greenberg & Colquitt, 2013). In this case, the staff is often sensitive to all decisions made by the leaders and employers, and they tend to assess these decisions if they are fair or not. These decisions, made by employers, influence an individual's behaviour and could result in severe workplace defiance. Therefore, it is crucial for organisations to consider putting in place the best leadership style to meet the needs of employees and their organisational justice needs.

According to Greenberg & Colquitt (2013), organisational justice, especially in organisations with diverse cultures, is mainly concerned with matters of the organisation's behavior ranging from employers treatment to pay, issues of gender equality, and training accessibility. These essential organisational justice elements were initially obtained from equity theory that highlighted that persons make verdicts on fairness based on their input equated to their output. Since organisational justice is concerned with the perceptions of the employees on issues of fairness and the type of leadership utilised, it can be viewed on three different accounts; interactional, procedural, and distributive.

Distributive justice is perhaps an essential type of organisational justice because it addresses the concerns of the employees, particularly their fairness of outcomes. Organisations can ensure equal distributive justice by sanctioning fair employment, effective communication, and educating employees on the organisation's practices. Procedural justice is mainly concerned with how the staff considers how results are decided to prevent any form of conflict that might arise from decisions made in the organisation (Yean, 2016). On the other hand, interactional justice is majorly concerned with how explanations are addressed and communicated in an organisation and rational employee treatment and sensitivity toward them. Just like procedural and distributive justice, interactional justice is mainly influenced by the type of leadership adopted by an organisation.

Making sure that organisational justice is considered ought to be a leading priority for any organisation. This is important because it helps minimise workplace incidences such as disengagements, absence, and defiance among employees. It also encourages constructive attributes, including progressive communication and conviction to the company. Organisational research is steadily becoming a multilevel concern in current businesses. Due to this, different studies have demonstrated a significant variation in organisations depending on leadership and, most importantly, cultural groups within the organisation.

This following section analyses the existing relationship between organisational justice and the transcendental leadership model.

A. Competence

The type of leadership adopted in an organisation directly influences its organisational justice and the employees' perception towards it. For an organisation to produce the desired results, employees need to have faith in the leader and their leadership style and have a practical organisational justice. In transcendental leadership, the leader emphasises competence, which is their capability for reliability and capacity to put themselves before others and their collaborators, even if it means sacrificing their individual interests. This element of transcendental leadership plays a significant role in influencing trust within the employees. Greenberg & Colquitt (2013) emphasises this conception in their conclusion that the relationship existing between organisational justice, confidence, and leadership is majorly grounded on reciprocity. The trust developed in the employee to the employers is developed from the personnel's convictions that since contemporary company decisions are made from a fair standpoint, future decisions will also be fair. In this case, exhibiting trust and integrity in transcendental leadership enables employees to develop a reciprocal correlation between organisational justice and trust.

Transcendental leadership influences the perception of performance in the organisation and faith in organisational justice (Barr & Nathenson, 2022). These leaders focus on results, align the employees, and motivate them to realise the organisation's vision. The influence of organisational justice views among the employees is obtained from the equity theory that is developed by the leader. By focusing on performance and meeting the set goals of the organisations, employers could potentially alter the employees' productivity by changing their job performance level. This improves the confidence of the employee in organisational justice. Procedural justice impacts the employee's performance due to the employee's attitudes. On the other hand, distributive justice influences performance only when output and efficacy are included (Alexakis, 2011)—advancing justice perceptions progress performance, productivity, and confidence to the organisational culture.

B. Communication and Employee Participation

Another potential relationship between transcendent leadership and organisational culture is presented in the feature of organisational communication and employee participation. Transcendent leadership focuses on ensuring effective organisational communication and employee participation advancement. Effective communication in an organisation increases the likelihood of an increase in perceptions of both informational and interpersonal justice among the employees and the leader (Greenberg & Colquitt, 2013). This leadership model influences the employees' perception in such a way that the leader adopting quality communication, especially when explaining critical organisational decisions, increases their confidence in inequality issues in the organisation. An example of this is when an organisation has to do away with certain positions. A leader that adopts transcendent leadership will explain the plan to every member to make the jobs redundant and treat the affected persons fairly and with dignity.

The rationale of this communication relationship between transcendent leadership and organisational justice was tested by Greenberg & Colquitt (2013), where an organisation minimised its employee pay in their two companies. In one company, the reduction in the employees' pay was explained to all affected personnel in a respective and sensitive approach. On the other plant, the leader did not explain the reason behind the pay cut. Following the reduction in the pay, Greenberg & Colquitt (2013) observed the employee theft that took place in the two organisations and determined that there was a high theft rate in the organisation that did not explain the reason for the pay cut; furthermore, inequality perceptions was minimised. This field-based study illustrates that effective communication from the leader to the employee influences organisational justice's employees' perceptions.

Another aspect that provides a relationship between transcendent leadership and organisational justice is employee participation. This involves a transcendent leader, including the employees in the decisions of the organisation and allowing them to present their inputs. This approach is imperative for the organisation and organisational justice since it enhances the employees' perceptions of justice. Yean (2016) supports this assertion and further highlights that an increase in employee participation and organisational justice due to transcendent leadership also occurs when the results do not favor the employee. When employees are given a chance to input their insights into the procedures of an organisation, it enhances perceptions of organisational justice, particularly interpersonal and procedural justice.

C. Commitment and Work Gratification

Transcendental leadership also ensures organisational justice is realised since it focuses on structural commitment and work gratification. Job satisfaction is positively linked to employees' views of the corporate culture. Employees often expect the principles of organisational justice are addressed from time to time. Transcendental leadership

emphasises this element by focusing on both employer and employee commitment. This involves its relation to the views of procedural justice, in that better-perceived justice is caused by an increase in organisational commitment. These conclusions illustrate that transcendental leadership has a direct connection to the elements of organisational justice.

D. Morals, Ethics and Pursuing Service

A distinct relationship between transcendental leadership and organisational justice is evident in the aspect of ethics, morals, and pursuing service in this leadership model. Leaders' overall performance that adopts this model is emphasised in honesty, faithfulness, and practical governance skills. The leaders also have responsibility, patience, and adherence to accuracy. Furthermore, their capability to make critical decisions basing on their reasoning and principles influences the employees to shape organisational behavior, thus, influencing a positive perception of organisational justice. These elements of the leader advance organisational justice, particularly in the employees, by ensuring that they make fair decisions. This mainly due to the conception that they are involved in the organisations, and they have the opportunity to voice their ideologies.

The feature of pursuing service in this leadership style also presents a relationship between transcendental leadership and organisational justice. Emphasising the common aspects of an organisation, guiding essential services in an organisation as the leading service provider that pursues to manage personnel and providing support and assistance allows the employees to progress emotionally and physically (Akram et al., 2020). It will enable the employee to consider fairness in the organisation since the leader addresses all the organisation's crucial aspects that allow justice. In pursuing service, a relationship is presented in the actions the personnel of a given organisation implements to uphold the organisation that is beyond their job's scope and job description. Akram et al. (2020) established that pursuing service, organisational ethics, and morals are directed to organisational justice, considering if the perception of justice comes from either the organisation or the supervisor.

E. Employee Emotions

Transcendent leadership always considers employees' moods and emotions, regardless of how insignificant they may look. As a result, employee emotions play a vital role in an individual's perception of organisational justice. This problem is often experienced during corporate events, and it is the employer's responsibility to utilise transcendent leadership skills to ensure the employee feels satisfied regarding organisational justice. An employee might interpret a given event differently. This majorly depends on the employee's disposition; for instance, several staff members may be too anxious when a problem occurs within an organisation. In such a situation, a transcendent leader should address the problem by engaging with the employee to ensure the employee avoids making the individual feel

left out. A meta-analytic review determined that both the trait and state level of an employee could essentially affect justice perceptions. In the event that an employee experiences positive affectivity and state, they are susceptible to undergo an increased perception of disruptive and interactional justice (Barney et al., 2015). A transcendent leader should, therefore, address such concerns effectively to avert negative perceptions of the employees.

IV. DISCUSSION

The culture of an organisation driven by the leader provides a direct link to organisational justice. Most organisations that do not utilise the transcendent leadership style in the world today are not necessarily structured to be either fair or unfair; they are mostly driven by the cultures instituted by the employer and the employees, most of whom have hidden plans and subjective thoughts (Barney et al., 2015). The transcendent leadership style calls for the capability to come up with policies for both organisational and individual development as well as the capacity to lead the organisation in finding the desired change and the approaches to develop change effectively (Anser et al., 2021).

These qualities are the basis of developing a culture that strives to ensure organisational justice, particularly how the workers perceive procedural justice. By creating a desirable corporate culture, there will be minimum instances of unfairness within the employees. Apart from employee emotions, transcendent leadership also emphasises addressing work behaviors that are contrary to the organisation's guidelines. By focusing on performance assessment, ensuring the unity of the employees, and realising work satisfaction, a leader with transcendent leadership skills promotes organisational justice by ensuring all employees' needs are addressed (Khaola & Rambe, 2021).

V. CONCLUSION

Organisational justice has been a fundamental concern of management research in the past decade. As a result of this association with transcendent leadership style and several employee outcomes such as trust, gratification, commitment, and concentrated turnover levels, they are directly linked with how the leadership is used and the workers' perceived justice levels. After a detailed review of contemporary literature on leadership development and its efficacy in the current business environment, this paper has observed that there are practical prospects in advancements of transcendent leadership and organisational justice. As illustrated by Greenberg & Colquitt (2013): transcendent leadership is linked to organisational justice in several ways and goes beyond the altercation of economics as well as economics. This is primarily because its leading purpose is inspiring employees to progress an interior control locus and a dedicated spiritual orientation.

This paper has adopted the perspective of transcendent leadership and its relation to organisational justice. In this view, transcendent leadership is defined as a style that is directly associated with leaders who emphasise motivating their employees. In contrast, organisational justice is defined as individual development concerning the moral and ethical standpoint of managerial conduct. This discussion had demonstrated that the potential relationship between transcendent leadership and organisational justice is presented in specific areas such as the leaders' and employer's commitment and work gratification, communication and employee participation, employees' emotions, competence and morals, ethics, and pursuing service. These areas have elaborated that there is a connection between these two variables. The relationship portrayed indicates the significance of transcendental leadership in helping organisations to realise their set objectives.

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Evaluating knowledge and farmer's perceptions towards alternate wetting and drying adoption among GAP suburban farmers in Thailand.

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Abstract: Despite the potential benefits of alternate wetting and drying (AWD) in rice cropping, Thai farmers are still reluctant to adopt the technology. Given the global water crisis, AWD is being promoted as water-saving technology, and the innovation aligns with the principles of good agricultural practices (GAP). Using a sample of suburban GAP farmers, the study assessed the influence of perceived advantages, knowledge, and trial adaptability of AWD adoption. A lower level of technical knowledge of AWD contributes to lower AWD adoption intention. Higher AWD adoption is driven by a higher perception of the ease of adoption and technical knowledge. Between GAP and non-GAP farmers, GAP farmers have a higher likelihood of implementing AWD due to the GAP requirement to promote water conservation management. The observed outcomes imply the potential of GAP farmers as early adopters of AWD in the initial scaling out of the water-saving technology to other provinces in Thailand. At the same time, access to crop insurance should be taken into account as a safety net against the risk involved with adopting new farming technology.

Keywords: water-saving, rice, suburban, Khlong Sam Wa

I. INTRODUCTION

Recent national and international policies in agriculture are geared towards promoting sustainable and safe food production. The policy shift is driven by consumers' increasing demand for safe and healthy foods. However, given the existing challenges (e.g., inefficiencies in farming, natural calamities, drought, flooding, climate change) coupled with more stringent requirements in meeting food safety standards added challenges among farmers in meeting the market demands [1].

In Asia, good agricultural practices (GAP) are widely promoted to answer the changing demand for safe and sustainable food crops [2]. While ASEAN member states introduced the ASEAN GAP in which member states align their local GAP standards. For example, Singapore has GAP-VAF, Indonesia with Indon-GAP, Philippine-GAP, Malaysian SALM, and Q-GAP for Thailand [3], [4].

Thailand's Q-GAP certification standards follow the Thai Agricultural Standard (TAS 9001-2013), wherein the majority of requirements are related to food safety [5]. The TAS has 122 requirements: 60 percent are on food safety, and 20 percent are on environmental management and growers' health and safety. Despite the overwhelming requirement for GAP certification, production under GAP is widely promoted among Thai farmers, especially among farmer exporters. Recently, importing countries such as European and US counties have preferred to import GAP-certified food crops due to the increasing consumer demands for safe food crops [3]. In addition, GAP certification allows Thai farmers to access international markets and premium prices for the crops produced under GAP principles [6].

In the Q-GAP standards under the TAS 1.6 and 1.8-1.10 requirements, water conservation and water-saving technologies are highly recommended for rice GAP. However, most Thai rice farmers practice continuous flooding in cultivating rice which uses large amounts of water [7]. Therefore, alternate wetting and drying (AWD) as a water-saving technology in rice farming has been increasing recently [7]–[9]. Rice cultivation under AWD is not continuously flooded but allowing the soil to dry for several days and be flooded again. Thailand began to introduce the AWD in 2016 as an alternative water-saving technology pioneered by the International Rice Research Institute (IRRI) based in the Philippines. Studies on AWD found a potential 25-30 percent reduction of water use without affecting rice yield [8]–[10]. In addition, AWD in rice farming could reduce methane emissions by as much as 48% [9], [11].

Given the potential benefits of AWD and the GAP standards relating to environmental and water

management, the potential of integrating AWD into GAP can be considered complementary and beneficial. Therefore, GAP farmers can be considered potential early adopters of implementing and scaling out the adoption of alternate wetting and drying. However, while studies investigating AWD's effects on rice farming are vast, there remains a scant availability of studies on AWD adoption as water-saving management under a GAP principle. Hence, this study assesses the potential drivers of higher AWD adoption intention among GAP farmers. In addition, farmers' perceptions towards AWD adoption were investigated.

The remaining sections provide the methodology applied in the study, followed by the results and discussion. Lastly, the conclusion and policy implications derived from the study results are presented.

II. Methodology

A survey was conducted in Khlong Sam Wa, Bangkok, Thailand, wherein the GAP (n=26) and non-GAP (n=30) farmers' perceptions of AWD adoption were assessed. Like the problem of water scarcity faced by farmers globally, farmers in the study area continued to explore alternatives to continuous flooding that requires high demand for water supply. Several empirical studies found support for alternate wetting and drying as one of the alternatives in water conservation, particularly for rice production.

Given the potential of AWD as a water-saving technology, this innovation is being promoted among irrigated rice farms in Thailand. However, despite the potential benefits, the rate of adoption remains low. The study investigates the potential drivers of higher AWD and farmers' perceptions towards the introduced water-saving technology. Equation (1) estimates the probability of AWD adoption due to the factors summarized in Table 1.

$$\ln\left[\frac{P_r(AWD=1)}{1-P_r(AWD=1)}\right] = \alpha_0 + \sum_{j=1}^{7} \alpha_j x_j \qquad (1)$$

$$marginal\ effects = \frac{\partial P_r(AWD=1)}{\partial x_j} \qquad (2)$$

The left-hand side of Equation (1) is the ratio of the probability of AWD adoption and the probability of non-adoption. The parameters α are the coefficient to be estimated, and x_j are hypothesized predictors of AWD adoption summarized in Table 1. Moreover, the marginal effects were derived from Equation (1) to facilitate the interpretation of the results. The marginal effects in Equation (2) allow interpretation of the estimated parameters as the marginal change for every unit change of the selected predictors in the logit model.

Selected predictors include the sociodemographic characteristic of the farmers, such as age, marital status, household size and whether the farmer is a GAP adopter. On the other hand, farmers' perception includes perceived

advantage, AWD knowledge, and perceived adoptability of rice farmers. Using an exploratory factor analysis, multiple indicators were used to derive the factor's sum score. The group indicators reflecting the perception factors were measured on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

TABLE I
SUMMARY STATISTICS OF THE VARIABLES

Characteristic	Non-adopter	Adopter
Age	54.30 (11.53)	56.38 (12.42)
Marital status [a]		
Single	7 (23%)	1 (3.8%)
Married	23 (77%)	25 (96%)
Household size	4.17 (1.70)	5.04 (2.31)
GAP adoption [a]		
GAP	18 (60%)	8 (31%)
Non-GAP	12 (40%)	18 (69%)
Perceived advantage	18.10 (2.72)	17.88 (2.18)
AWD knowledge	6.57 (0.86)	6.96 (0.34)
Perceived adaptability	17.70 (1.58)	21.35 (2.68)

Note(s): continuous variables are in mean (standard error);
[a] categorical variables are in n (%)

III. Results and discussion

A. Knowledge and perceptions of farmers towards AWD

Farmers' perceptions of AWD's perceived advantages, ease of adoption and adoptability are presented in Figures 1-3. In addition, workshops and AWD farm demonstrations were conducted to assist farmers, especially among farmers unaware of AWD technology.

Studies on AWD adoption found that the main driver of higher adoption intention is the perceived capacity of the technology to reduce water input in rice production [7], [12]. While among sampled farmers, 30 percent perceived the benefit of adopting AWD in water conservation and 40-45 percent viewed AWD as a better alternative to continuous flooding.
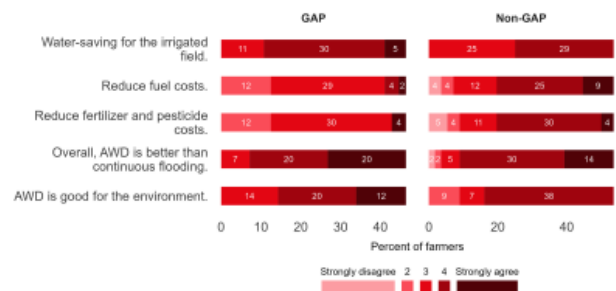

Fig. 1. Farmers' perceived advantages of adopting AWD.

Between GAP and non-GAP adopters, a larger proportion of GAP farmers are more likely to adopt AWD to their rice farming. For instance, 43 percent of GAP adopters against 37 percent of non-GAP have suitable farm areas for AWD adoption. At the same time, 43 percent of GAP farmers responded that AWD could be easily adopted with the existing farming practices against 21 percent of non-GAP

farmers. The higher perceived ease of adoption among GAP farmers can be attributed to their exposure towards stringent requirements on the production protocol under the GAP certification.
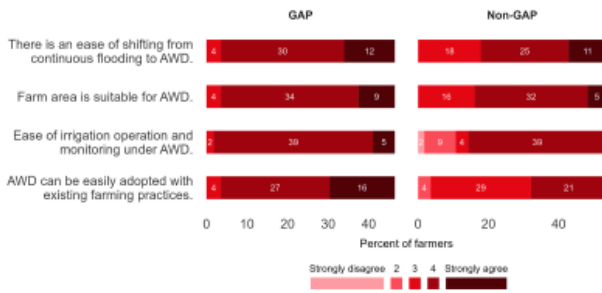

Fig. 2. Farmer's perceived ease of adoption of AWD technology.

In terms of farmers' capacity to adopt an AWD trial, an apparent proportion of GAP is confident in taking AWD trials to their rice farms compared to non-GAP. The observed characteristic of GAP implies that early scaling out of AWD adoption is more viable towards the GAP farmers. Often farmers are risk averse in adopting innovations in farming, and success stories of innovation adopters can influence the decision of non-adopters, especially if both groups (i.e., adopters and non-adopters) belong to the same farming network [13]–[16].
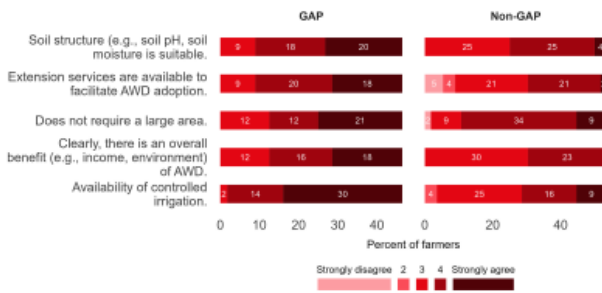

Fig. 3. Farmer's perceptions on AWD trial adoptability.

B. Drivers of AWD adoption using logit regression

The preceding section demonstrates farmers' perceptions towards AWD adoption, while Figures 4-5 illustrate the effects of selected factors towards the probability of adopting AWD. Figure 4 provides the probability in the logit of adoption intention, while Figure 5 shows each factor's marginal effects towards AWD adoption intention.

The explanatory variables in the model, except age, are positively associated with a higher probability of adopting AWD. For example, higher education attainment increases the adoption intention among sampled farmers, likewise for farmers with larger household sizes. As AWD technology requires technical knowledge, farmers with higher education attainment have the advantage. The positive effect of educational attainment is often observed among adoption studies [8], [17]–[19]. The inverse relationship between age and adoption intention suggests that younger Thai farmers are more likely than older Thai farmers to adopt AWD. The

inverse relationship between age and adoption intention suggests that younger Thai farmers are more likely than older Thai farmers to adopt AWD. The negative relationship between age and adoption intention is also observed in Bangladesh [8] and the Philippines [19]. At the same time, a larger household size is considered an important contribution toward labour inputs, particularly in family labour [17], [19].
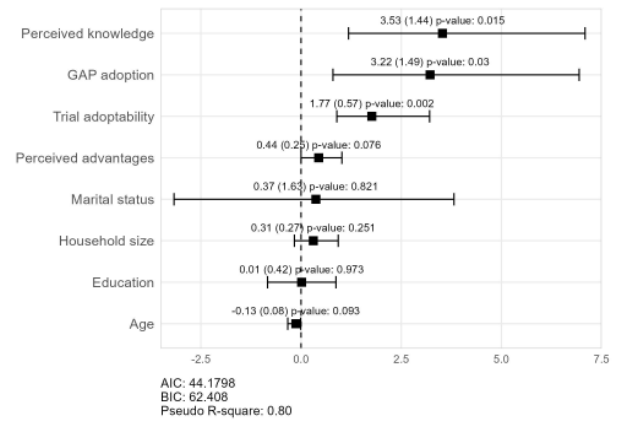

Fig. 4. Determinants of AWD adoption using logistic regression.

Looking at the variable of interest – GAP adoption, perceived knowledge, trial adoptability, and perceived advantages, GAP adopters are 25 times more likely to adopt AWD than non-GAP. This can be partly attributed to more training GAP farmers received as part of the GAP certification, wherein technical knowledge in farming is included in GAP certification processes. The results provide evidence of the viability of integrating AWD as a recommended water-saving technology under the TAS standards on water management for rice GAP.

Moreover, the farm's perceived advantages and suitability in AWD adoption trials increase the probability of adoption. While perceived knowledge of AWD shows the highest marginal effects, implying that this factor is the most critical driver of AWD adoption intention among the selected predictor variables.
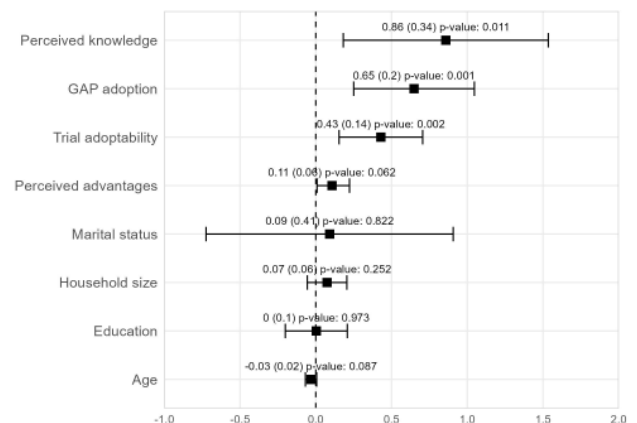

Fig. 5. Factor's marginal effects of AWD adoption.

IV. Conclusion and recommendations

Existing studies on AWD adoption intention are increasing; however, there is scant availability of looking at the technology's adoption intention among the GAP adopters. Under the GAP certification, the use of water-saving technology is one of the requirements for rice GAP under the TAS 9001-2013 in Thailand. Hence, the study investigates the farmers' perceptions and potential drivers of AWD adoption. As AWD adoption in Thailand remains low, the study considered the viability of integrating AWD as water-saving technology within the GAP principles in the initial scaling of promoting AWD in rice farming. The study's result supports this notion wherein GAP farmers are 25 times more likely to adopt AWD in their rice farming practices.

Whereas factors related to farmers' perceptions of AWD, higher perceived knowledge of AWD has the highest marginal effects. The results imply the need to enhance the technical knowledge of AWD, especially the success of integrating AWD in farmer's rice farming requires a certain level of technical expertise for safe alternate wetting and drying. The role of local agricultural extension services providing accurate information and close coaching on implementing safe AWD will be crucial in promoting the use of AWD.

On the other hand, discussion with farmers reveals that perceived risks associated with adopting new technology are still a significant barrier for farmers. Access to crop insurance will be necessary as a safety net for farmers in the event of crop failure. Assistance from the agricultural sector of the government in accessing crop insurance coupled with close coaching for a safe AWD implementation will contribute to the success of scaling out the adoption of AWD as a water-saving technology among rice farmers.

Acknowledgement

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