

**THE ACCEPTANCE OF HYDROPONIC TECHNOLOGY TOWARDS
CONSUMER BUYING BEHAVIOR IN MELAKA, MALAYSIA**

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DECLARATION

“I admit that this report is the result of my own, except certain explanations and passages where every of it is cited with sources clearly.”

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DEDICATION

I would like to dedicate the appreciation to my beloved family especially my parents who always provide the support and encouragement to me when I faced the challenges in university life. Next, I would also like to dedicate to my supervisor and panel who offered valuable suggestion to me throughout the research, friends and course mates for the assistance during the completing of research.

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ABSTRACT

Nowadays, Malaysia is an agricultural country that it is rapid developing into an industrial country. The people still relying on the traditional farming method. So, hydroponic technology was replaced the traditional farming method because hydroponic technology provides efficient nutrient regulation, higher density planting, and leading to increased yield along with higher quality of the produce. Researcher is using technology acceptance model (TAM) as theory model to know how users come to accept and use the technology. This research aims to identify the relationship between hydroponic technology and consumer buying behavior when making buying decision of hydroponic products. Quantitative research is used to conduct this research. Therefore, questionnaires will distribute to the public in Melaka by randomly. A total of 384 respondents were selected in this research by using convenience sampling technique. Statistical Package for Social Science (SPSS) is the software use to analyse the data gathering from respondents. The data analysis method that used to interpret the data were descriptive analysis, multiple regression analysis and Pearson Correlation analysis. Therefore, this research is expected to enhance the awareness and acceptance of consumers toward hydroponic products. The results showed that all the factors had significantly influenced consumer acceptance towards hydroponic products. Quality was the most influencing factor and all the research objectives had been achieved in this study. Researcher provided some perceptions and feedbacks as implications to help agriculture institutions and retail supermarket in having a better understanding and develop better strategies to enhance the consumer acceptance towards hydroponic products. Recommendations for further research were also suggested in this research.

Keywords: *Agriculture, Hydroponic Technology, Consumer Buying Behavior, TAM Model, Melaka, Malaysia*

ABSTRAK

Pada masa kini, Malaysia adalah sebuah negara pertanian yang berkembang pesat menjadi sebuah negara perindustrian. Rakyat masih bergantung pada kaedah pertanian tradisional. Jadi, teknologi pertanian tradisional digantikan dengan kaedah hidroponik kerana teknologi hidroponik menyediakan pengurusan nutrien yang cekap, penanaman ketumpatan yang lebih tinggi, dan peningkatan hasil serta kualiti produk yang lebih tinggi. Penyelidik menggunakan model penerimaan teknologi (TAM) sebagai model teori untuk mengetahui bagaimana pengguna menerima dan menggunakan teknologi. Kajian ini bertujuan untuk mengenal pasti hubungan antara teknologi hidroponik dan tingkah laku pengguna apabila membuat keputusan membeli produk hidroponik. Kajian kuantitatif digunakan untuk menjalankan kajian ini. Oleh itu, soal selidik akan diedarkan kepada orang ramai di Melaka secara rawak. Sejumlah 384 responden telah dipilih dalam kajian ini dengan menggunakan teknik sampling kemudahan. Pakej Statistik untuk Sains Sosial (SPSS) adalah penggunaan perisian untuk menganalisis perhimpunan data daripada responden. Kaedah analisis data yang digunakan untuk mentafsirkan data adalah analisis deskriptif, analisis regresi berganda dan analisis korelasi pearson. Oleh itu, kajian ini diharapkan dapat meningkatkan kesedaran dan penerimaan pengguna terhadap produk hidroponik. Keputusan menunjukkan bahawa semua faktor telah mempengaruhi penerimaan pengguna terhadap produk hidroponik. Kualiti adalah faktor yang paling mempengaruhi dan semua objektif penyelidikan telah dicapai dalam kajian ini. Penyelidik menyediakan beberapa persepsi dan maklum balas sebagai implikasi untuk membantu institusi pertanian dan pasar raya runcit mempunyai pemahaman yang lebih baik dan membangunkan strategi yang lebih baik untuk meningkatkan penerimaan pengguna terhadap produk hidroponik. Cadangan untuk penyelidikan selanjutnya juga dicadangkan dalam kajian ini.

KATA KUNCI: *Pertanian, Teknologi Hidroponik, Tingkah Laku Membeli Pengguna, Model TAM, Melaka, Malaysia*

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LIST OF ABBREVIATION

ANOVA	=	Analysis of Variance
DV	=	Dependent Variable
GDP	=	Gross Domestic Product
HC	=	Health Concern
IV	=	Independent Variable
MRA	=	Multiple Regression Analysis
NFT	=	Nutrient Film Technique
PKT	=	Perceived Knowledge and Trust
PR	=	Perceived Risk
PU	=	Perceived Usefulness
QU	=	Quality
SPSS	=	Statistical Package for Social Sciences
TA	=	Taste and Appearance
TAM	=	Technology Acceptance Model
TPB	=	Theory of Planned Behavior
UNESCO	=	United Nations Educational, Scientific and Cultural Organization

LIST OF SYMBOLS

H_0	=	Null Hypothesis
H_1	=	Alternative Hypothesis
β	=	Beta
α	=	Constant
R	=	Correlation Coefficient
R^2	=	Coefficient of Determination

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Agriculture means the cultivation of land and animals and plants breeding to produce food, fiber, medicinal plants and other products in order to maintain and enhance the standard of life (International Labour Organization, 1999). Agriculture's key development is the growth of sedentary human civilization, through which the cultivation of domesticated types created food surpluses that enabled people or citizen to live in cities. Agriculture has conventional and continues to be a very essential industry for the European economy. Europe has become the second biggest exporter globally with agricultural exports price €61.1 billion in 2002. Additionally, agriculture acts as a vital role in country development and employment and with evolution and maintenance of trade links with outer world (Vilnius, 2008).

Malaysia is a rapid developing agricultural country into an industrial country. According to Murad et al (2008), Malaysia has 4.06 million hectares of plantation lands which is planted with commercial crops by 80 percent of this land. Agricultural policy of the Malaysian government emphasizes rising the yield production, achieving food self-sufficiency and to rise the export of agricultural products to other country. Around 90 percent of farmers in the food industry are small-scale farmers. These smallholders not only the price of production is high, but also low crop and poor quality of products. Agriculture contributed 9.3 percent to the national GDP in 2014 and 97 percent of the irrigation water derived from the polluted rivers, so agriculture remains an important industry in Malaysia. However, a valid food or irrigation policy for the effective control of wastewater irrigation have not been established (Foo, 2017).

Malaysia's agriculture sector has been relied on conventional farming method. Conventional agricultural has been defined as the practice of soil growing crops and the application of nutrients, pesticides, and herbicides.

In the era globalization, the yield of the farm production had increased dramatically due to improvements in breeding, nutrients, and technology. Hydroponic is one of the agriculture technologies for farm producers to produce the higher quality agriculture production. Hydroponic is a method of increasing crops without land using a water solvent with mineral nutrient solutions (Santos et al., 2013). For the hydroponic, the plant's root is directly absorbed by the nutrient, so that the plants can grow closer together than conventional plants. Hydroponic plants grow up to two times quicker with higher yields than conventional soil cultivation strategy because of the root system's high oxygen levels, optimum pH levels for enhanced intake of nutrient and water and optimum balanced and high graded nutrient solutions (Paul et al., 2011). Hydroponic was developed to preserve water and land and to protect environment in reducing the utilization of pesticide and herbicides.

For the past generation, people always rely on the conventional agriculture method, but they never know the conventional production have plenty of pesticide that will affect the people's health. Nowadays, consumer will accept the hydroponic technology and willing to buy the hydroponic products. According to Ronteltap et al. (2007), there are plenty of similarities between consumer acceptance of food technologies and technology-based innovations and those in different areas. Consumer behavior consists of consumers' concepts, actions, feelings and experiences with additional surroundings factors such as costs and commends (Stuttgart, 2007). Consumers buy a product or service not only because of its real usefulness, however due to its perceived worth. There consists of many factors of an individual purchase certain thing (Manali, 2015).

This study is aimed to determine the acceptance of hydroponic technology towards consumer buying behavior according to technology acceptance model (TAM). TAM model is a theory of information systems that models how users accept a technology and use it. The hydroponic technology that mean soilless culture technology will replace the conventional method of plantation. Therefore, the

hydroponic technology and the consumer buying behavior became relevant relation whether the technology can acceptable or unacceptable by the consumers.

1.2 PROBLEM STATEMENTS

Nowadays, organic products have started to catch the attention of consumers buying behaviour. The products are known to create healthier environmental condition for living things. The main problem was about the environment pollution and health issues. In Europe, environmental and health issues have become popular since mid-1980s (Greenan et al., 1997).

In conventional agriculture industry, the use of pesticides and pesticides can cause the environment pollution. In agriculture, the essential question is that the connection between intensive mass production and its environmental effect (Zilberman et al., 1999). According to Aminuddin et al. (2005), a part of the usage of fertiliser is typically lost through leaching and runoff due to heavy rainfall. Heavy soil fertilisers input will cause soil poisoning for cultivation of plant. Some of the negative impacts of conventional agriculture include inefficient water use, high land requirements, high levels of runoff pesticides and soil degradation (Barbosa et al., 2015).

Besides, researcher studies the consumer behavior towards the organic products due to increasing demand for organic food and increased public awareness of health (Suchitra et al., 2009). Nowadays, the conventional cultivation system does not meet the current and future demand of food. Therefore, there was an actual need for adapting new cultivation system that stimulates plants to grow rapidly (Raneem et al., 2018).

Thus, this study aimed to determine the acceptance of hydroponic technology towards consumer buying behavior. This research will be conducted in Melaka. The results of such study should enhance the awareness and acceptance of consumers to purchase the hydroponic products.

1.3 RESEARCH QUESTIONS

The following were the research questions which were important in this study:

1. What are the factors that influencing consumer buying behavior?
2. Is there any relationship between hydroponic technology and consumer buying behavior when making buying decision of hydroponic products?
3. What is the most significant factor influencing consumer buying behavior towards acceptance of hydroponic products?

1.4 RESEARCH OBJECTIVES

Consumer buying decision of hydroponic products is depends on the acceptance of the hydroponic technology. This is important for researcher to study more on technology acceptance model (TAM) of hydroponic technology to gain better understanding of the relationship between the hydroponic technology and the consumer buying behavior. The research objectives are as follow:

1. To identify the factors that influencing consumer buying behavior.
2. To analyze the relationship between hydroponic technology and consumer buying behavior when making buying decision of hydroponic products.
3. To investigate the most significant factor influencing consumer buying behavior towards acceptance of hydroponic products.

1.5 SCOPE OF STUDY

The study is only focus on acceptance of hydroponic technology towards consumer buying behavior. This research would identify the relationship between hydroponic technology and consumer buying behavior. The research was conducted in Malaysia. In this research, the scope of survey only focused in Melaka area. The respondents who stayed or travel in Melaka area and above 18 years old were selected randomly in order to obtain the adequate and comprehensive information.

1.6 LIMITATION OF STUDY

The research's limitation are geographical factor and time constraints. This research is going to conduct in Malaysia and this research will give inadequate time to complete the collection of data. For this research, data collection is limited and data is only applicable in Melaka, Malaysia.

Research's limitation occurs in assessing secondary information. Some articles, journals and reports online need to be paid in advance for reading.

Next, the limitation was language and knowledge. For the language problem, the questionnaire was only designed in Malay and English version while for the knowledge problem, some respondents might not really understand with the hydroponic technology concept. This may cause some time delay and confusion as some respondents unfamiliar with the meaning of the questions. Therefore, researcher had to explain the meaning of the questions to respondents by using their familiar language.

1.7 IMPORTANCE OF RESEARCH

Although hydroponic systems are faced by a lot of challenges, but it has attracted much attention because of plenty of benefits it presents to growers compared to the conventional method of farming. Hydroponic yield production has significantly rise in recent years worldwide because it allows systematic use of water and fertilizers, additionally a better pest control (Shalini et al., 2018). Therefore, the acceptance of the hydroponic technology will influence consumer buying behavior. The measurable of buying intentions was the predictor of following purchases and consumers acceptance (Masran et al., 2015).

Mazar and Zhong (2010) stated that consumer acceptance is associated to consumer behavior wherever consumers are willing to buy the product as a result of it is affected by their intention. Therefore, according to Costa-Font et al. (2008), consumer behaviors must be understood to look at the consumer acceptance. This study is important since the previous studies were not Malaysia-based and different country have different consumer buying behavior and culture. Lastly, this research can improve the public awareness on environment issues.

1.8 SUMMARY

In this chapter, by using technology acceptance model (TAM), researcher would identify the relationship between the hydroponic technology and consumer buying behavior This chapter had introduced the background of study, problem statements, research questions, research objectives, scope and limitation of study, and importance of research. Researcher will proceed to second chapter which discussed about the part of literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, researcher discussed about the definition and relevant theories of hydroponic technology and consumer buying behavior. This chapter enhanced the understanding of study that carried out by researcher through secondary data such as articles, journals and others. The theories, concepts and relevant terms for this topic were explain in detail. For more perceptions to understanding with this research of topic, this chapter were organized in subtopics. Section 2.2 described about overview of agriculture. In section 2.3 discussed about hydroponic technology. In section 2.4 would brief about the consumer buying behavior and factor influencing it. Section 2.5 showed the factor influencing consumer buying behavior towards hydroponic products. Section 2.6 discussed the technology acceptance model (TAM). Section 2.7 explained the variables influencing consumer acceptance to hydroponic technology. Researcher also developed the theoretical framework in Section 2.8. Hypothesis had been developed in section 2.9 in order to test in the study. Lastly, the summary for Chapter 2 was showed in Section 2.10.