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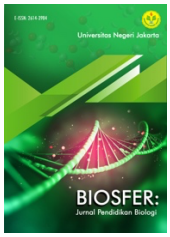

Developing booklet of "vegetables aquaponic": Improving knowledge, interest of consumption and motivation of vegetable cultivation

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ABSTRACT

Lack of public knowledge, interest, and motivation regarding the benefits of vegetables as well as the development of vegetable cultivation techniques that are easy to apply on limited land have resulted in low levels of daily vegetable consumption. One effort to overcome the low consumption of vegetables is to increase knowledge about nutrition and nutrition contained in them by using booklet media. This research aims to develop a booklet with an attractive and easy-to-understand design, to increase interest in consuming and motivation to cultivate vegetables. Based on the results of media and material expert feasibility tests, the aquaponics booklet obtained a result of 92% in the very suitable category, while user testing in the development process obtained a result of 94% in the very suitable for use category. Based on the results of the t test, the 2-tailed Sig value was 0.009 <0.05, which means there was a significant increase in knowledge about vegetables after participants took part in aquaponics training. The results of the correlation test show that there is a high and positive relationship between interest in consuming vegetables and motivation to grow vegetables with a correlation of 0.676. Thus, it can be concluded that the vegetable aquaponics booklet has met the feasibility based on user testing and can increase knowledge, consumption interest, and motivation to grow vegetables.

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INTRODUCTION

Vegetables are an important component in fulfilling nutrition and health (Septiani et al., 2020). Vegetables are needed by the body as micronutrients, a source of vitamins, minerals, and dietary fiber which are important for the growth, development, and health of the body. Based on Riskesdas (2013), 93.5% ofthe population aged 10 years and over have a consumption pattern of less vegetables and fruit. Basedon the data obtained by the Central Bureau of Statistics, it is known that consumption of vegetables has decreased in the last 5 years. Based on recorded data, Indonesians only consume 43% of the amount recommended by the Food and Agriculture Organization, which is 75 kg per capita per year.

The low desire to consume vegetables is influenced by several factors including the availability of vegetables, consumption patterns of the surrounding environment, and knowledge of the nutritional value contained in vegetables. Sartika's research (2022), states that the main factor for the low consumption of vegetables is due to the lack of effective knowledge of the nutritional value contained and the attitude of ignoring the importance of consuming vegetables which results in wrong behavior related to the consumption of vegetables. The low consumption of these vegetables will have an impact on health, such as disturbances in the digestive system, stunted growth due to malnutrition, and several other diseases (Muna & Mardiana, 2019).

One effort to overcome the low consumption of vegetables is to increase knowledge about nutrition and the nutrients contained therein. Knowledge of nutrition is a person's understanding in terms of knowledge, substances, and the interaction of nutrition with health (Sadida et al., 2019). Nutritional knowledge includes the types, chemical composition, and benefits derived from consuming vegetables. Azhari's research (2020) said that knowledge of nutrition influences interest in consuming vegetables.

Nutrition education will run well if it is supported by the right media and methods of delivering material (Ghani, 2018; Kelley & Knowles, 2016; McComas et al., 2018; Ramcilovic-Suominen et al., 2016; Rustaman, 2017). Print media is an effective tool in conveying new information because it is static, and contains text, images, and photos which, when presented properly, will increase the attractiveness and interest of readers in reading, thereby facilitating the process of receiving new information (Maf'ula et al., 2017; Miarsyah et al., 2020; Qumillaila et al., 2017; Ristanto et al., 2020a, 2020b). Based on the above background, it is necessary to develop a booklet that contains the benefits and nutrients contained in vegetables which are beneficial for growth and health. With the creation of this booklet, it is hoped that it will make it easier for the public to know the nutritional content of vegetables and the benefits of consuming vegetables. In addition, it is hoped that the community will have the motivation not only to consume but also to cultivate vegetable plants in theirenvironment.

METHODS

Research Design

Research uses descriptive analysis, namely examining the status of human groups, conditionsor current events to make descriptive systematically factual and accurate (Nazir, 2014). The method used in research and development (R&D) according to Hanaffin & Peck (1998) is an effort to develop and produce a product in the form of materials, media, tools, or learning strategies toovercome problems (Tegeh & Kirna, 2010). The Hannafin and Peck model is divided into three phases: the needs analysis, design, development, and implementation(Pratomo & Irawan, 2015).

Population and Samples

The population of this study consisted of 80 people living in the Duren Sawit sub-district, East Jakarta. The samples taken in this study were 14 participants in the Klender sub-district, East Jakarta, Indonesia.

Instrument

This study used the Booklet instrument on Vegetables and Aquaponic Techniques. The booklet is a reference for participants to understand the benefits, and content of vegetables and farming using aquaponics. Understanding knowledge about vegetables using a test instrument including a multiple-choice test totaling 20 questions. The questionnaire instrument was used to determine participants' motivation to grow vegetables using aquaponics techniques.

Procedure

The first stage of this research was to create and develop a booklet regarding information and how togrow crops using aquaponic techniques. The booklet was then tested on expert users and general users. The implementation stage was to conduct research on 14 participants by being given a pre-test participants' initial knowledge regarding vegetable and aquaponic techniques before being giventraining and booklets. In the next stage, training is carried out with participants given a booklet as a guide to understanding the benefits, and contents of vegetables and aquaponic techniques. After the training presentation, participants were given a post-test. At the end of the activity, participants were given a questionnaire asking about the participants' motivation for planting using aquaponics techniques.

Data Analysis Techniques

The data analysis technique in this research is quantitative descriptive. To determine the increase in students' knowledge regarding vegetables, a Paired Sample T-test was conducted. Before carrying out the paired sample t-test, the prerequisite tests are carried out, namely normality and homogeneity. The data to be analyzed are the participants' pre-test and post-test knowledge scores with 20 multiple-choice questions. The multiple-choice score is given 1 for the correct answer and 0 for the wrong answer (Khaerudin, 2016). Analysis of participant interest, motivation, and satisfaction questionnaire data contained 20 statement questions, with the value categories strongly disagree (score 1), disagree (score 2), doubtful (score 3), agree (score 4), strongly agree (score 5) (Sugiyono, 2010).

RESULTS AND DISCUSSION

Research on the development of a vegetable aquaponics booklet as an effort to increase interestin consuming and motivation to grow vegetables. has been completed and has gone through several stages and existing procedures. The procedures in this development research include product analysisto be developed, initial product development, and expert trials. The expert trial stage is carried out bymaterial experts, media, and potential users.

From the several stages that have been passed, quantitative data and qualitative data are obtained. Quantitative data is data that is calculated, has a value limit, and has assessment criteria obtained from a questionnaire distributed to the three experts, namely two material experts, one mediaexpert, and two potential users. While qualitative data is data in the form of input, additions, criticisms,and suggestions given by these experts.

Qualitative assessment is carried out using the results of material and media expert feasibility tests on each assessment indicator to determine the feasibility of material in aquaponic booklet media. Indicators used in media expert due diligence instruments include booklet display characteristics, booklet functions and benefits, material quality, and booklet quality in general. To find out the feasibility of aquaponics booklet media so that it can be used, this booklet media was tested by five expert test people, namely five people who are lecturers at the Faculty of Mathematics and Natural Sciences, State University of Jakarta.

Table 2

Media and material expert test

No	Component Aspects	Average Aspect	%	Category
1	Characteristics and appearance	60	92 %	Very Worthy
2	Functions and Benefits	18	91 %	Very Worthy
3	Material Quality	18	90 %	Very Worthy
4	Booklet Quality	19	93 %	Very Worthy
	Average %		**92 %**	**Very Worthy**

The product is categorized as very valid based on the average percentage of product Media and material expert test as a learning medium of 92% and is expected to increase interest in Consuming and Motivation to Grow Vegetables. In Table 2 it is known that the average value in the aspect of characteristics shows a score of Percentage 92 % with a very valid category, this shows that the appearance possessed by the aquaponic booklet in terms of research, layout design, and clarity of material is very good for use by readers. This aquaponics booklet is feasible to use, because of the contents. The material in the booklet is short and accompanied by pictures. The booklet is designedwith attractive and uses a supportive blend of colors for the material growth and development of plants. In addition, the

booklet is printed with ISO-compliant paper size, which uses art paper with a size 14.8 x 21.0 cm paper, so booklets are easy to carry.

In the aspect of functions and benefits, the average value given by the Media and material expert test is 91% with very valid categories, this shows that aquaponics booklets can be appropriate and useful to use, to facilitate the process of understanding readers about aquaponic information. In the aspect of material quality, the average score given is 90% with an Excellent category. This shows that the material presented in the booklet is appropriate, can foster user interest in being able to consume vegetables, and can increase user understanding of the types and benefits of vegetables. In the aspect of booklet quality, an average score of 93 % was obtained with a very valid category, thisshows that aquaponic booklets provide youth to use, with clear language and attractive colors. Basedon Table 2 above, with 25 criteria contained in 4 aspects can state that booklet media is suitable for use in increasing interest in consuming and motivation to grow vegetables

Table 3
Due diligence by users

Component Aspects	Average	Percentage	Category
Characteristics andappearance	60	92.10 %	Very Worthy
Functions and Benefits	19	95.00 %	Very Worthy
Material Quality	19	95.00 %	Very Worthy
Booklet Quality	19	95.00 %	Very Worthy
Total Score		94.00 %	Very Worthy

To determine the feasibility of aquaponics booklet media so that it can be used in increasing consumption interest and motivation to grow vegetables, this booklet media will be tested for user eligibility by 8 users with different work backgrounds, ages, genders, and activities. The purpose of selecting different respondents is to measure the feasibility of using booklets by various groups, both ordinary people such as housewives and people with backgrounds and activities as workers.

Based on the feasibility test on several aspects, the perception obtained from aquaponics booklet usersis very feasible to increase interest in consuming and motivation to grow vegetables. In theaspect of Characteristics and appearance, the average score obtained from users is 92.1 % with a very worthy category, so it can be said that the display of the aquaponics booklet between the material, andthe display presented can be read and understood easily by users. Based on aspects of functions and benefits of the aquaponics booklet, the data obtained below the user stated very feasible with a percentage of 95%. Based on these data, it is known that aquaponics booklets help users to be able to easily understand about aquaponic farming. Users also rate that aquaponics booklets can be used appropriately and attractively so that they are easier to understand.

Based on the aspect of material quality regarding aquaponics and the type of vegetables used, users say that the booklet is very feasible to use with a percentage of 95%. Users consider that the accuracy of the content and completeness of the material contained in the booklet is very suitable to be used. The material can also motivate users to farm modern aquaponics.

Based on the aspect of booklet quality in general, results are obtained in the form of very decent with a percentage of 95%. Based on the data, it is obtained that the aquaponics booklet makes it easy for users to understand the technique of growing vegetables. The use of attractive colors, clarity in the use of language, and the appropriate booklet size are the reasons the booklet has a qualitythat is very worthy of use. The homogeneity test obtained a Sig value. of 0.462, greater than 0.05, it can be concluded that the data is homogeneous. For the normality test, the Sig value was obtained. 2 tailed is 0.2, greater than 0.05, so it can be concluded that the data is normally distributed

Table 4.
T-test results in one-group pre-test and post-test design of knowledge about vegetables

Average	Mean	SD	SD Error Mean	95% Confidence Lower	95% Confidence Upper	t-count	df	Sig.
74,6480	5.71429	7.03	1.87941	9.77450	1.65407	3.040	13	.009

The increase in participants' knowledge about vegetables was measured using a test instrument in the form of multiple-choice questions consisting of 20 questions. This measurement was carried out twice, namely at the beginning of the activity (pre-test) and at the end of the activity (post-test). Froma

total of 14 respondents, the following are the pre-test and post-test averages which can be seen in Table 4.

In Table 4, the results of the pre-test regarding knowledge of vegetables reached a score of 74.64, meaning that participants were able to answer more than 50% correctly, although some participants still had scores below 50. It is proven that the participants' knowledge about vegetablesbefore the provision of material is quite high. After participants were given the material, a post-test wascarried out and the average score increased to 80.00. This means that training activities can increase participants' knowledge about vegetables.

The increase in knowledge obtained because of the training proves that this activity has succeeded in increasing public awareness of the importance of vegetables. This statement is supported by the opinion of Sekti & Fayasari (2019) who state that education about vegetables is directly proportional to vegetable consumption patterns. This success was also supported by the initial conditions of the community itself, which already had a sufficient level of awareness of the benefits of vegetables. By the data obtained, the highest level of knowledge on average was possessed by participants over 30 years of age. Overall, there was an increase in the average frequency of answers. This is because apart from the respondents having been given training in the form of material about the benefits of vegetables and aquaponics, it is also due to the initial knowledge that the participants alreadyhad (Carson, 2007; Rittle-Johnson et al., 2016; Secretariat of the Convention on Biological Diversity, 2010; Woolley et al., 2019).

This interest and motivation measurement uses a multiple-choice questionnaire with 5 options: strongly agree, agree, not sure, disagree, and strongly disagree. This instrument consists of 20 statement items consisting of positive items and negative items. Measurements were carried out after completing training. The average score of interest in consuming vegetables and motivation to grow vegetables canbe seen in Figure 1.

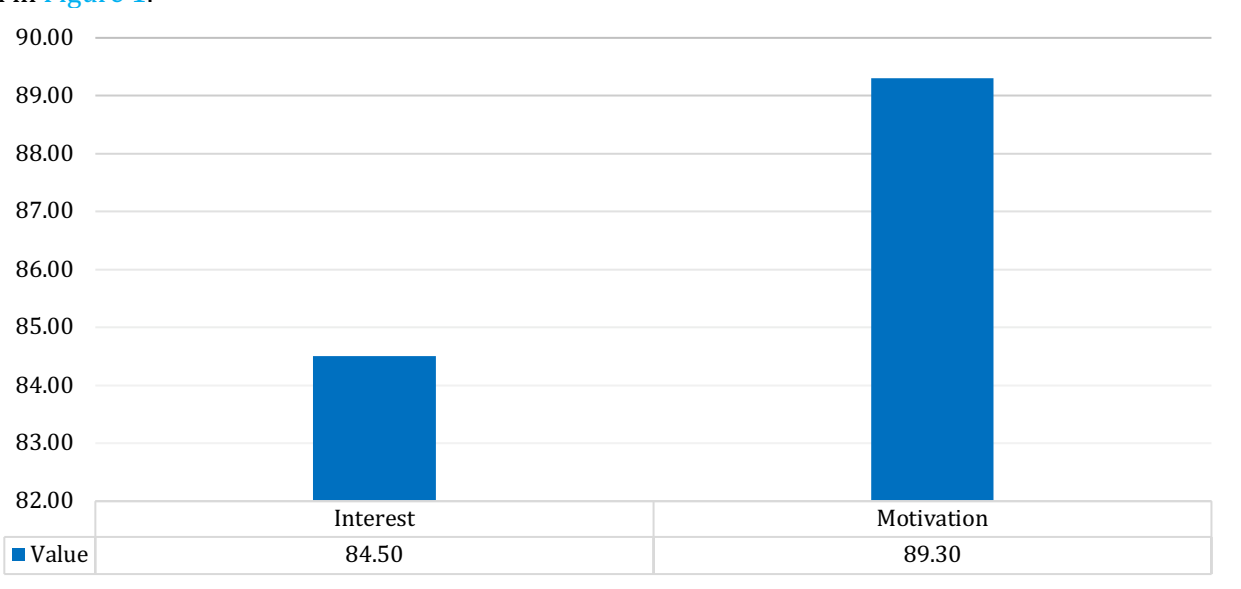

Figure 1. Average Value of Interest and Motivation

Figure 1 shows the participants' interest and motivation in consuming and growing vegetables after being given training. In the picture, the average value of interest in consuming vegetables is quite high, namely 84.5. The high interest of participants in consuming vegetables was caused by an increase in participants' knowledge about the benefits of vegetables. This is in line with research conducted by Syamsi (2019) which states that socialization and training give residents the understanding that consuming vegetables is very good and important for our bodies. Furthermore, the high interest of participants in consuming vegetables will encourage participants' motivation to grow their vegetables to meet their daily needs. This is proven by the high motivation score, namely 89.3. Supported by the opinion of Ramierez-Andreotta (2019) that people who grow vegetables tend to consume more vegetables. It can be said that people who have a high motivation to grow vegetables tendto have a high interest in consuming vegetables (Darmawan et al., 2019; Fuster-Guilló et al., 2019; Martinsen & Furnham, 2019; Ningsih et al., 2019; Ristanto et al., 2020a; Rizky et al., 2020).

Table 5.
Correlation Test between Interest and Motivation

		Interest	Motivation
Interest	Pearson Correlation	1	.676**
	Sig. (2-tailed)		.008
	N	14	14
Motivation	Pearson Correlation	.676**	1
	Sig. (2-tailed)	.008	
	N	14	14

**. Correlation is significant at the 0.01 level (2-tailed)

Based on the results of the correlation test, show that there is a high and positive relationship between interest in consuming vegetables and motivation to grow vegetables with a correlation of 0,676. Booklet media is a visual media whose use involves the sense of sight. In its effectiveness, the use of the senses in receiving information will result in a person's better understanding of the information they receive (Ewins, 2006; Maulina et al., 2020; Nanclares & Rodríguez, 2016; Puspita et al., 2017; Rahman et al., 2018). This is supported by research by Meidiana et al (2018) which states that the information received from using visual media is better and remains in the respondents' memories because visual media makes it easier to convey information. According to research conducted by Prafena, Prafena et al., (2022), activities in the form of vegetable cultivation training can increase people's knowledge so that they can motivate them to growvegetables and interest in meeting food needs. It can be concluded that training activities can increaseparticipants' knowledge about the types and benefits of vegetables, as well as foster interest in consuming vegetables and motivation to grow vegetables in participants.

CONCLUSION

Based on the results of the validation test of the vegetable aquaponic booklet for expert users and general users in the development process, it can be concluded that the vegetable aquaponic booklet as an effort to increase consumption interest and motivation to grow vegetables has met the feasibility based on the expert validation test with an average score of 94% with very feasible criteria. to use. Based on the paired sample t-test, a value of 0.009 was obtained, so it can be concluded that there is an influence of using booklet media on increasing knowledge about types of vegetables, increasing interest in consuming vegetables, and motivating people to grow vegetables using aquaponics techniques.

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