Mathematics Learning Module Based on Character Learning: A Proposal of The Study

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Abstract

This study is a research proposal paper that aims to develop mathematics teaching and learning modules based on character education. This study uses development design guided by ADDIE model. The analysis process will use a quantitative approach. The validity and reliability processes to be carried out are the content validity level, content validity index and Cronbach's alpha analysis. Sampling techniques are intended to be used to select samples for validity and reliability purposes. The sample is among mathematics education experts, module experts, Language experts and students. This study is expected to have an impact on educators in conducting module development systematically. It is hoped that the module developed can be used as a guide to all education, especially mathematics educators in implementing the teaching and learning process based on character education. This study will help the Malaysian Ministry of Education to achieve the mission, vision and aspirations of the country's education in the future.

Keywords: Learning, Character Learning, Proposal.

Introduction

Malaysia is a multi-ethnic country and nation building efforts are the main agenda of the government. Ethnic Malays are the majority, followed by Chinese, Indian and others. The government's intention is to unite all ethnic groups under one umbrella known as *"Bangsa Malaysia"*. This can be realized through the setting of a vision. The Vision of National Prosperity 2030 contains three main objectives. One of the three main objectives is a united, prosperous and dignified country. This is also the country's commitment to be a sustainable country from various aspects including economic and political. Commitment to make the country united and prosperous by 2030 (Kementerian Hal Ehwal Ekonomi Malaysia, 2019). This will be able to produce people who have the soul of the nation.

Nation state is seen as a process of community integration. This process can be achieved through economic resilience. Various programs are planned to stimulate internal stability, improve the quality of life of the community. This means that unity in one nation is important. This will build a united nation and eventually form a nation state (Saad et al., 2012). To be a successful country, the concept of nation state in Japan can be used as the main reference. The capabilities possessed by the Japanese today are the result of the unity of their people who are willing and willing to be in a group of one identity. That is why the

world community was not surprised by the strength that Japan possessed especially when Japan invaded the United States and the British in World War II. Therefore, the agenda of building this nation-state must be given priority by the country to achieve a well-respected developed country.

A country is no longer considered successful if it is able to produce intelligent and smart people, but fails in educating the people to become noble human beings. One aspect of education that can be emphasized is character education. Character education has basically existed for so long. Character education develops in line with the history of education itself. However, there are various terms that are often used such as moral education (Malaysia, United States of America), value education (United Kingdom) dan character education (Asia). In the mid-1930s, John Dewey focused on public schools on the need for moral training and development and encouraged them to provide an environment for student moral development (Mulkey, 1997).

According to Field (1996), during World War II, character education was reviewed. Educators often debate the issue of character education. Most educators argue that character education needs to be taught in some form. However, they are still unclear how to apply it in public education. During that period, programs such as "social education," "education for social adjustment," and "building a social foundation" were implemented to develop the social and civic awareness of young people to achieve the desired national goals. In the Malaysian context, character education has been made a special subject such as Islamic Education, Moral Education, History and Civic and Citizenship Education (Hasnah et al., 2017). This unique education is compulsory for Malaysia because it has multiracial citizens. Ministry of Education (2016) has drafted the Secondary School Standard Curriculum (SSSC) based on six main core and one of them is humanity. Humanity aims to produce people for the 21st century who master the knowledge and skills to conceptualize, develop intellectual skills, appreciate the basic values of democracy and build problem-solving skills.

Education has two main purposes, namely to help people become smart and intelligent, and also to educate people to be good. Shaping human beings to be wise is easier than making them good human beings (Sudrajat, 2011; Lickona, 1993). However, Malaysia through the National Education Philosophy has set a detailed goal that is to produce a balanced human being. Thus, character education is an important aspect that needs to be emphasized so that our country can produce intelligent and noble citizens. In the context of mathematics, we not only see mathematics as a subject of arithmetic, calculation but see mathematics as a subject of social science. Students are expected to be able to solve problems in their daily lives through mathematical concepts (Irfan, 2016).

Like other disciplines, mathematics is also influenced by cultural values in development and teaching. Although the results are the same calculation, mathematical methods and techniques are different in every culture of the world community. Palinussa (2013) gives examples of the use of mathematics in the Chinese calendar and the Islamic calendar. Although both are calculated based on the circulation of the moon, but the beginning of the calculation is different. It shows there is a cultural influence in methods and techniques, but in the end, the results and formulas are the same. This can also be seen in Indonesia which has a cultural diversity. They have used ethnopedagogy in the culture of learning and teaching (Palinussa, 2013). Recognizing these differences is important for countries like Malaysia that have various ethnicities. This is able to enhance the development of the character of Malaysian citizens as a successful nation-state.

The development of vision-oriented mathematics learning modules, problem solving, based on local culture can enrich students' knowledge of mathematics, enable students to face global challenges, and even closer to student culture (Sukestiyarno et al., 2019). Therefore, a study needs to be carried out to develop a nation-state. A module through the integration of character education and mathematical pedagogy need to be develop. Hopefully, this study will have a good impact, especially on the policy of the National Prosperity Vision 2030, Malaysian Education Development Blueprint (MEDB) 2013-2025, and Ministry of Education Malaysia.

Problem Statement

The Ministry of Education Malaysia (MOE) under a National Education Philosophy wants to produce comprehensive human beings in terms of physical, emotional, spiritual, intellectual and personality. Change after change is made by the MOE in line with current developments and demands. Various skills need to be supplied and applied to students to enable them to be competitive and have added value, at the same time it is able to increase their potential and talent at the highest level. Through this philosophy, education as a whole needs to be emphasized as education plays an important role in creating the quality of human resources to have the ability to compete with the challenges and development of the 21st century era (Zurqoni et al., 2018).

The MOE through the MEDB has outlined some key aspirations namely reducing the achievement gap between urban and rural, socioeconomic and gender based by 50% by 2020. MEDB also stressed that Malaysia's position in the Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA) tests can be upgraded to the top one-third position. In 2015, the national mathematics achievement score has shown an increase from 440 points to 465 points. This also happens when the math achievement score in the PISA test also shows an increasing trend. However, the national student achievement score level is still below the average score level set by the OECD (Ministry of Education, 2019).

Malaysia's achievements have basically shown improvement after various policies have been changed. The achievement of national mathematics and science has shown an increase in scores in the Trends in International Mathematics and Science Study (TIMSS) test (Ministry of Education, 2016) and Program for International Student Assessment (PISA) (Ministry of Education, 2019). The Ministry of Education (2016) stated that the achievements of the country's TIMSS have shown an improvement where Malaysia managed to improve the position for Science subjects in 24th place by recording 471 points in 2015, compared to 32nd place (426 points) in TIMSS 2011. For mathematics subject, Malaysia is in 22nd place with 465 points, up four places compared to TIMSS 2011 with 26th position (440 points). This increase is the result of the application of the elements of High Order Thinking Skills (HOTS) into teaching and learning. This proves that teaching and learning play an important role in achieving goals towards building individuals, communities and nations.

This shows a good development from an academic aspect. However, the quality of an individual is not only seen in academics, but also in terms of their character. Therefore, the focus and strategy of developing human capital is seen no longer focused on the academic path only but focusing on results from various other aspects. Thus, developing students' ability to be religious, healthy, knowledgeable, capable, creative, and independent as well as democratic and responsible citizens is a noble endeavour. This will achieve a firm goal to maintain the well-being of the country. It also requires a balance between students' cognitive

and affective abilities (Zurqoni et al., 2018). The progress achieved by the country must be balanced with the spirituality, emotions and personality of its people. Thus, the emphasis on individual character development is also important. In other words, education also aims to develop the character of students to individuals who are useful to families, communities and the country.

Child character development is the responsibility of all. This responsibility does not rest on the parents alone. While parents are key educators in shaping the character of their children, empirical research states that parents also expect all adults who have relationships with their children to contribute to education like their children's teachers (Virtues, 2014). According to Francom (2013), character education can be implemented well if the school emphasizes such education from their childhood until they graduate. This means that the development of good student character requires the cooperation of various parties, namely individuals, the community and the school community. This cooperation is able to reduce the problem of student discipline that is increasingly worrying. A total of 10,154 disciplinary cases for various offenses involving students in nine states only, were recorded throughout 2018 (Noraina, 2019). Setiawan (2017) also states that there is an increase in criminal cases, human rights violations, legal injustice, various damages or vandalism throughout the country, free association, pornography and pornography among teenagers, violence and riots, as well as corruption which is getting worse in all sectors of life. This is important to overcome because it reflects the existence of human capital as a result of education from the national education system.

One of the efforts of the Ministry of Education Malaysia to address this problem is to make moral education or Islamic education as a compulsory subject. This effort also does not lie with the ministry but needs to be addressed jointly. School leaders are one of those individuals who need to work hard to address this issue. School leaders across the country are implementing character education initiatives to combat negative student behavior, to improve academic outcomes and the school climate. Therefore, various efforts have been made to empower school leaders and one of the strategies undertaken is to introduce the School Transformation Program 2025 (TS25). The Ministry of Education (2019) has set three main goals to be achieved by all schools, namely strengthening school leadership, maximizing the potential of teachers and students as well as strengthening the involvement of parents and the community. Through this program, all parties will work together in educating the nation.

The decline in the moral quality of individuals, especially in the daily life of human beings, especially in Malaysia requires researchers to implement improvements in character education. Character education is a formal effort to help a person understand, pay attention, and practice good ethical values. Among the characters that need to be emphasized are respect, responsibility, honesty, caring, and fair. The end result that needs to be seen and said to be successful is when the student is able to implement the values stated above in their daily lives (Sudrajat, 2011). Thus, a study to develop a nation-state model based on character education in mathematics education needs to be conducted so that the country can achieve a developed country with citizens with commendable character. This is able to ensure the well-being and harmony of the country in the future. This approach is also capable of building a generation with noble national values. This is in line with the goals that need to be achieved through the Vision of Common Prosperity 2030. This vision emphasizes the commitment of the people of the country to become a prosperous nation, a people united without prejudice

by celebrating diversity of races and cultures as the basis of national unity (Ministry of Economic Affairs, 2019).

In the Malaysian context, elements of the concept of character education are only applied to a minimum and not in depth in various syllabi such as the subject of History, Moral Education, Islamic Education, Economics and Civic Education and Citizenship (Hasnah et al., 2017). This character education is not integrated with other subjects (Sukestiyarno et al., 2019). Many studies have been conducted by foreign researchers by applying character education in the teaching and learning of mathematics such as in South Korea (Kim, Bae, Choi, Kim, & Lim, 2019), Indonesia (Irfan, 2016; Palinussa, 2013), Denmark (Sukestiyarno et al., 2019), China (Sumaryanto, Ahmadi, Sugiman, & Yuanbing, 2019), Japan (Suyitno et al., 2019) but such studies are poorly conducted in Malaysia. Most studies in Malaysia only focus on thinking skills (Afifi et al., 2019), leadership skills (Afifi, Nor'ain, & Mazlini, 2016), STEM (Science, Technology, Engineering and Mathematics) (Wong & Kamisah, 2018). Therefore, this study is very well implemented and has implications on the unity and prosperity of the country in the future.

Purpose of the Study
This study was conducted to develop mathematics teaching and learning modules based on character education.

Literature Review
History of Character Education
Character education has basically existed for so long. Character Education developed in line with the history of education itself. However, there are various terms that are often used such as moral education (Malaysia, USA), value education (United Kingdom) and character education (Asia). In the mid-1930s, John Dewey focused on public schools on the need for moral training and development and encouraged them to provide an environment for student moral development (Mulkey, 1997). Nowadays, "Citizenship" readers are becoming widely available to students; at the same time, there has been a decline in the number of formal character education programs as stability and hope of returning to the country as a result of New Testament policy. The current emphasis is on patriotic values (Field, 1996).

According to Field (1996), during World War II, character education was reviewed. Educators often debate the issue of character education. Most educators argue that character education needs to be taught in some form. However, they are still unclear how to apply it in public education. During that period, programs such as "social education," "education for social adjustment," and "building a social foundation" were implemented to develop the social and civic awareness of young people to achieve the desired national goals. In the Malaysian context, character education has been made as a special subject such as Islamic Education, Moral Education, History and Civic Education and Citizenship (Hasnah et al., 2017). This special education is compulsory for Malaysia because it has multiracial citizens. The Ministry of Education Malaysia (2016) has formulated the Secondary School Standard Curriculum (KSSM) based on six main thrusts and one of them is humanity. Humanity aims to produce people for the 21st century who master the knowledge and skills to conceptualize, develop intellectual skills, appreciate the basic values of democracy and build problem-solving skills.

Education has two main purposes, namely to help people become smart and intelligent, and also to educate people to be good. Shaping human beings to be wise is easier

than making them good human beings (Sudrajat, 2011; Lickona, 1993). However, Malaysia through the National Education Philosophy has set a detailed goal that is to produce a balanced human being. Therefore, character education is an important aspect that needs to be emphasized so that our country can produce intelligent and noble citizens.

Character Education Concepts

The concept of character education understood in Malaysia is not very clear because it should be applied in various fields. Teachers' knowledge of the concept of true character education is still vague. Many teachers do not clearly understand the concept of character education. In the Malaysian context, elements of the concept of character education are only applied to a minimum and not in depth in various syllabi such as the subject of History, Moral Education, Islamic Education, Economics and Civic Education and Citizenship (Hasnah et al., 2017). Character education is the process of forming student character that has a positive impact on their emotional, spiritual, and personality development. Therefore, character education is an important part of building a nation's identity. Emotional, spiritual, and personality intelligence is essential in building strong, independent, active, creative and dedicated characters.

Lickona (1993) explains three main reasons for the improvement of late education at the end of the 20th century. First, the role of the family. which is declining. Parents have traditionally been the primary moral teachers of children. However, a large number of children today fail to be raised by their parents as a result of their busy work schedule. Second, the increasingly disturbing character traits of young people. This does not only happen from certain generations but also covers the range of all the younger generation regardless of other factors. Third, the rehabilitation of adolescent ethics needs to be done together. The moral decline in society has had a detrimental effect in recent times. The recovery process needs to be carried out wisely, adults should promote this good morality by teaching young people, directly and indirectly, such as values of respect, responsibility, trust, justice, compassion, and the welfare of society, and that values -these values are not just subjective priorities but they have objective values and demands according to their wishes. These three factors have been a major factor in the development of character education in schools in addition to other societal problems that have increased (Hayes, Lewis, & Robinson, 2011). Character education has also shown to improve school climate, academic outcomes and to reduce negative adolescent behavior (Battistich, 2003). Therefore, emphasis should be placed on this education and not only taught separately but also taught across various subjects, especially mathematics.

Character Education Model

Lickona (1992) explains that character is based on two things, namely respect and responsibility. There are three main constructs in the formation of the character, namely moral feelings, moral understanding and moral actions. These three constructs will also be achieved through 12 comprehensive approaches to character education. If all these points can be implemented in the daily life of the school, the development of character education can be achieved well. This can be illustrated as in Figure 1. Researchers will use this model as a reference in developing a nation-state model based on character education and mathematics teaching and learning.
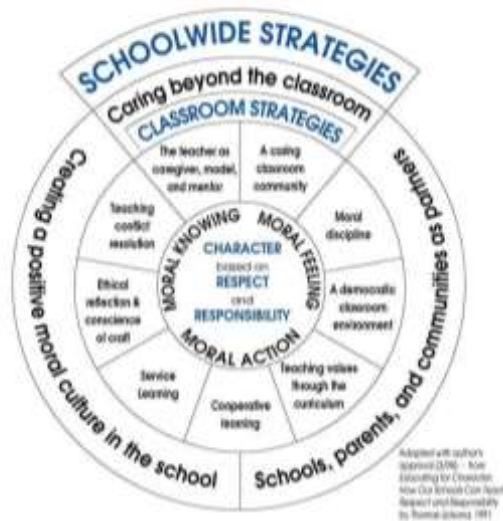
Figure 1. Character Education Model

Character Building through Mathematical Learning

The purpose of learning mathematics is not just to focus on arithmetic mathematics. mathematics is a Social Science. Students use mathematics in their daily lives. They are required to use mathematics to solve the problems they go through (Irfan, 2016). According to Suwarsono (2011), virtues can be developed through mathematics such as logical values in thinking, values of careful thinking, decision-making skills, values of discipline to comply with rules and agreements made, values of perseverance and patience in dealing with problems, values of self-reliance , the value of honesty in action, the value of time appreciation, and the value of democracy. Irfan (2016) explains some mathematical concepts that can be implemented in shaping student character are as follows.

First mathematics teaches us to be disciplined and to obey rules. If not disciplined and breaking the rules, it will lead to an incorrect and inaccurate meaning and solution. For example, the Fibonacci sequence (1,1,2,3,5,8, ...). Rules on the Fibonacci sequence to summarize the previous two conditions. If this rule is violated, the Fibonacci sequence is no longer obtained. Second, mathematics also teaches us honest values. Honesty is now a rare thing. Many people are willing to lie to make a profit. In one hadith, Rasulullah SAW called the characteristics of the hypocrites one of them said a lie. Honesty can be taught through mathematical learning. For example, when a teacher asks a student, "Does the student already understand?" If students do not honestly say understand but it turns out they do not understand, then they themselves will feel a loss. Since mathematics is a chained and related lesson, their misunderstanding will continue on the next topic. When the nth material is not understood, then all n + 1 materials will not be understood, because they are interrelated. Third, fair and wise. A just and wise attitude can also be instilled through learning mathematics. For example, in a system of linear equations. Students must wisely choose a solution (removal, replacement, or mixing). Students also need to be fair when solving a system of linear equations. If the right side minus 8, the left side will also be reduced to 8. Therefore, mathematics also leads us towards a good character that is fair and wise.

Mathematics can bury the nature of prejudice. Students must have the belief that all issues have a solution. Every real hardship can be easy. We can see the concept of absolute price and the concept of several compartments. Whatever the number, whether positive or negative, the result will be positive. (-3) 2 = 9; | -3 | = 3. Character building is an effort to educate children to make the right decisions and practice them in daily life, so the decision to make a positive contribution to the environment (Megawangi, 2004). Koesoema (2007) expressed the same notion that the character is an anthropological structure that focuses on the process of development in man continuously to improve himself as a noble man. Those are the values of charity such as perseverance, responsibility, generosity and others. Rachman (2010) also suggested that as a deliberate and deliberate effort to inculcate characters in student character building must be done with this KBK i.e. consistent, continuous and consistent. In more depth, Hasan et al (2010) detail the characters to the following indicators: religion, assertiveness, tolerance, discipline, hard work, creative, independent, democratic, curiosity, spirit of nationalism, patriotism, achievement of appreciation, friendship / communicative, peaceful, love of reading, environmental care, social care and responsibility.

Therefore, teachers play an important role in applying the existing values in mathematics so that students can use them in daily life. These unrealized values can be worked out better based on the model of the nation-state based on character education as well as the teaching and learning of mathematics.

Research Methodology
This study is to develop mathematics teaching and learning modules based on character education. According to Ghazali and Sufean (2016), design type development research is a form of study developing a module, or they create software or build a model. Thus, the researcher will use this design while developing the module. The researcher chose to use a quantitative approach in developing this module. Although, this design can be carried out using a quantitative, qualitative approach or even a combination of quantitative and qualitative as suggested by Ghazali and Sufean (2016). The researcher will develop the module using the ADDIE module development model.

ADDIE stands for Analysis, Design, Development, Implementation and Evaluation (Piskurich, 2006; Ummu Nasibah et al., 2015; Ni Komang, Syahrudin, & Wawan, 2013). The ADDIE model is illustrated based on Figure 2.
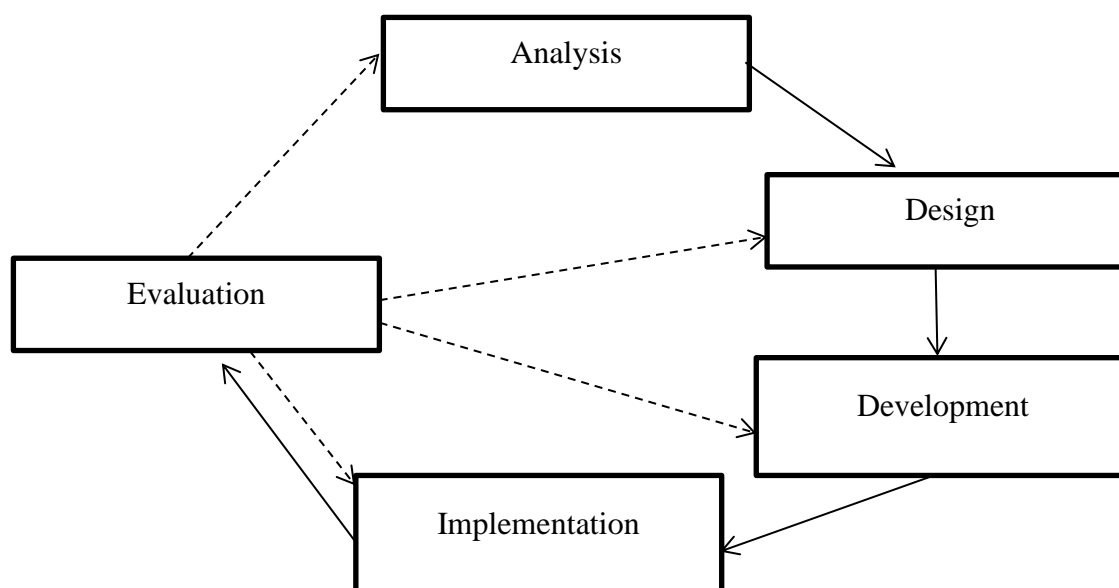
Figure 2. ADDIE Model. Adapted from Piskurich, (2006)

This model has divided each construction process into five main phases namely analysis, design, development, implementation and evaluation. This feature is one of the justifications for the selection of the main reference model by the researcher. This is because the process of building this model is easy to understand through a flow chart picture that explains step by step in an orderly and organized manner. In addition, the evaluation factor of each level in this model allows researchers to make changes to improve the quality of modules built for each phase. According to Ni Komang et al. (2013), the ADDIE model is good to develop and use in the learning process because it has a systematic process. This also coincides with the opinion of Ummu Nasibah et al. (2015), the ADDIE model is one of the systematic and thorough teaching design models. In the study report conducted by Soto (2013) stated that the ADDIE model is a model often used by teaching designers, and researchers. Researchers also argue that this model will encourage team work from the analysis phase to the evaluation phase. This is because each phase of this model, requires the researcher to work with other parties to help produce the desired module..

The ADDIE model will be able to develop this systematic module in the context of design to achieve learning outcomes. The researcher will develop this module based on a summary of the methodology as Table 1. This means that, during the analysis phase, the researcher will conduct document analysis procedures, needs review and interviews.

Table 1.
Phases and Methodology of the ADDIE model

Phases	METODOLOGI
Analysis	• Document Analysis
	• Needs survey
	• Interviews
Design	• Brainstorming
	• Literature Review
	• Document Analysis
Development	• Module
	• Expert Confirmation
	• Pilot
	• Validity and reliability
	• Improvement
Implementation	• module running test
Evaluation	• Evaluate the effectiveness of the module both before and after implementation

The researcher will use two instruments, namely the validity questionnaire and the module reliability questionnaire. This questionnaire was developed by researchers based on the recommendations of Jamaludin (2015). To determine the validity of the content of a module, there are two methods of evaluation analysis made by researchers. The two methods of content validity determination analysis are Content Validity Level and Content Validity Index (CVI). The use of percentage method is made based on the adaptation of Jamaludin (2015) content validity instrument. Based on the views of module experts, the value of 70 percent is considered to have high content validity. This item is evaluated using the following formula::

$$\frac{\text{Total Expert scores(x)}}{\text{Maximum Score}} \times 100 = \text{Content Validity Level}$$

In addition, researchers will also analyze content validity based on content validity index (CVI). This is in line with the opinions and suggestions put forward by Rubio et al. (2003) and Lynn, (1986). According to them, one way to calculate the validity of content is to get a CVI value. This is calculated based on the total number of experts who agree to be divided by the number of experts appointed. CVI values of 0.80 and above are considered to have excellent content validity (Rubio et al., 2003). This is interpreted based on the number of panels that have been appointed (Lynn, 1986; Afifi et al., 2017).

Jamaludin (2015), stressed that the process of obtaining module reliability of the sample should follow the steps as summarized through Figure 3. The reliability process begins with constructing a reliability questionnaire based on the objectives of the study. Next, the developed module was tested to run to the sample. Upon completion of the test run, the questionnaire was distributed to the sample to be answered. Repeated process for each unit in the module. The collected data were then analyzed and the Cronbach's alpha coefficient was calculated. If the value of the Cronbach's alpha coefficient is satisfactory, then the module

is considered to have reliability. The results of this analysis will prove that the module is ready to be tested for effectiveness.
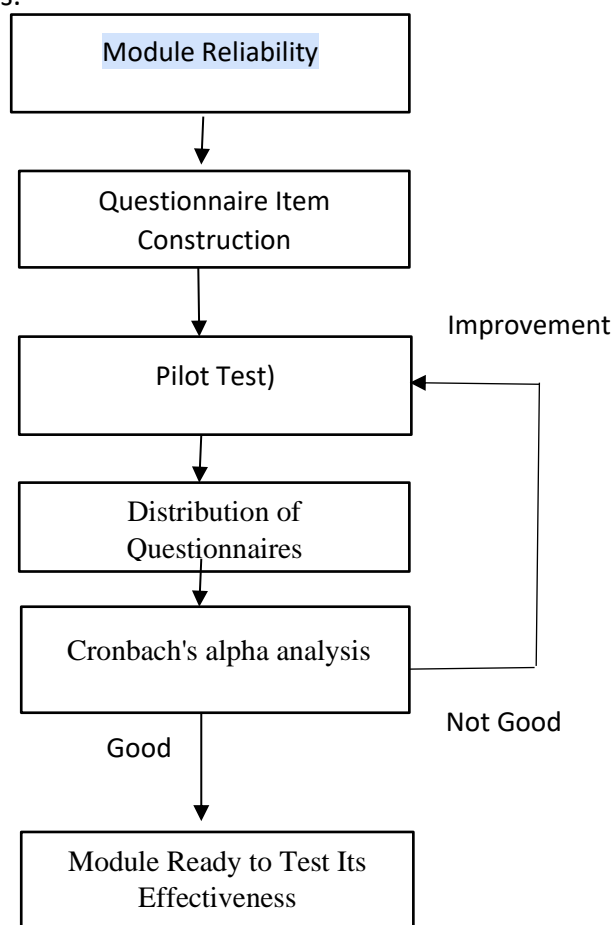

Figure 3. Module reliability testing process.

In conclusion, the process described is to ensure that this module has high validity and good reliability. Sample selection is based on purposive sampling. Therefore, this module is expected to have a positive impact on the variables to be tested.

Conclusion
This study focuses on the development of teaching and learning modules based on character education. Studies related to character education, especially in mathematics education, are very poorly conducted, especially in Malaysia. This is due to the inability of teachers in implementing this character-based approach, especially in mathematics education. Character education is often studied through other subjects such as Islamic Education, Moral Education, History and Civic Education. The impact of this subject on character value enhancement is undisputed. However, the addition of character values in Mathematics Education is good and can have a positive effect. Mathematical education studies are often studied based on other elements. However, the study of character education in mathematics education is lacking, especially in Malaysia. Values in mathematics are seen to have an impact on the construction of human capital. Character education in mathematics can have a long-term impact on Malaysia. This education has long been used in Japan, Korea and various other developed countries. This can be seen through the character of the people of that country who have a very high character. This can be done by developing countries such as Malaysia with the start

of module development. This module can be used as a guide to educators, especially mathematics to carry out teaching and learning. This module is expected to have good implications for students with a systematic development process. This is hoped to be able to achieve the goals of Malaysia's mission, vision and educational aspirations.

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