

Validity and Reliability of Multimedia Interactive Making Clothes (MIMP) Module for Home Science Subjects

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Abstract: *The purpose of this study is to evaluate the validity and reliability of the Multimedia Interactive Making Clothing (MIMP) module. It is developed for the teachers to learn and facilitate (LFC) the teaching of topics on the subjects of Home Science (HS) in the Malaysian schools. The design of the study is quantitative and the survey method is used to collect data. The MIMP module has been certified by eight experts in the relevant fields of HS Education, ICT and Malay Language. A total of 37 HS students from Miri Sarawak Division were selected to test the reliability of the module activity by evaluating the effectiveness of LFC in each teaching session. The findings show that the module has a good validity of 82.5% and high reliability with an Alpha Cronbach value of .92. However, some aspects need to be improved so that the developed module can meet the objectives for which it has been designed. The findings of the study would be useful to other researchers who intend to develop other teaching modules based on the ASSURE Model. In conclusion, the researcher hopes that this module will help the students in learning and teachers in facilitating the teaching of the topic of making clothes.*

Keywords: *Validity, Reliability, Multimedia Interactive Module, Making Clothes, Home Science*

I. INTRODUCTION

Technical and Vocational Education (TVET) is not only intended to produce knowledgeable and skilled workers (Reeve, 2016), but also to train individuals who are innovative, able to apply contemporary and scientific methods to skillfully solve problems, and capable of producing products and services (Reeve, 2016). In the 10th Malaysia Plan, TVET went through a reform and change phase. Subsequently, in the 11th Malaysia Plan, The Ministry of Education (MOE) still focuses on increasing the attractiveness of TVET as an educational path of choice. The delivery system of TVET also went through a transformation phase in line with the globalization,

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economic development, technological advancement and global labor mobility (Mohd Jalil, Noor & Anas, 2015). In terms of curriculum, MOE has integrated vocational education into the school system by offering vocational subjects as an elective study. Among them are the Home Economics (HE) subjects introduced in the year 1992.

Home Economics is a global subject (Smith & Zwart, 2010). Initially, the HE education focuses only on the daily life activities of the family and meets the basic human needs. Today, the teaching of HE is not merely to meet the needs of everyday living, but is seen as a field of learning and profession. While the knowledge and skills acquired from the HE education are useful for students and their family, the same are widely applicable in the field of occupation, industry, business and community activities (Reeve, 2016).

In Malaysia, the HS subject is a continuation of the HE subject implemented at the upper secondary form-four and form-five classes of the Integrated High School Curriculum. The teaching and learning of HS are based on competence of 80 percent practical work, while the remaining 20 percent is theoretical work (Suriani, Arasinah & Norhayati, 2016). It is found that the students' mastery of the theoretical and practical skills of clothing and sewing components is still at a modest level (Bujeng, Kamis, Mohamed & Puad; 2018). The students' achievement can be improved if they are often exposed to the attractive and exciting LFC method (Castro, Andres & Prestoza, 2018; Bujeng et al., 2018). In reality, the teachers do not have an effective technique in creating a learning environment that can attract the students' interest and attention (Yap, 2016; Uwameiya, 2015) they continue to use the traditional method, which is very bored (Cyrill, 2016; Yap, 2016).

In the 21st-century learning, teachers are required to provide a learning environment such that students can have an authentic experience and better understand the knowledge and skills they are learning. According to Smaldino, Lowther and Russell (2012), PAK-21 emphasizes three main components of learning, namely teaching strategies, variety of learning contexts and technology integration, and media and materials to support teaching and learning. Teaching and learning based on ICT and multimedia methods are often said to have a positive impact on these aspects: consistency of memory (Hung et al., 2017;



Oberfoell & Correia, 2016; Yap, 2016; Cyrill, 2016), understanding, skills and achievement (Karaci et al., 2018), and enhancing students' motivation (Yanika, Moon, Sharon, Alan & Sally, 2017). However, the integration of ICT into the teachers' teaching methods remains at a low level (Irfan & Amat, 2015). The TVET teachers are less computer-savvy and lack the necessary skills to use ICT in their LFc (Irfan & Amat, 2015). Hence, the teachers need to be provided with the multimedia-based materials and associated training so that the goals and learning needs can be achieved (Karaci et al., 2018).

Additionally, students today prefer the use of ICT in teaching and learning, in an effort to understand the difficult and abstract concepts (Bujeng et al., 2018; Yanika et al., 2017; Bernad & Anuar, 2016). While there are a handful of teachers using the multimedia software to teach the topic of making cloths, the software packages they use are incomplete or obsolete, not interactive and less systematic (Bujeng et al., 2018).

Based on the identified problems, the researchers have developed an interactive multimedia teaching module for the topic of making cloths with the support of ICT-based media and technology; this soft package is entirely dedicated to the purpose of teaching the HS subject. Interactive multimedia learning modules developed by the local multimedia professionals are difficult to apply in the classroom setting because they are less relevant to syllabuses, while the imported multimedia modules from abroad are less in line with the Malaysian context (Siti, Mohamed & Mai Shihah, 2017). The development of the current module is guided by six phases in the ASSURE model as elaborated by Heinich, Molenda & Russel (1993). The validity and reliability of the module activities are carefully evaluated so that the developed module will reach the desired quality.

The purposes of the study are as below:

1. Evaluate the validity level of the MIMP module.
2. Evaluate the reliability level of the MIMP module.

II. LITERATURE REVIEW

1. Validity

According to Creswell (2012), validity refers to the accuracy of a study tool when it is used to measure the characteristics under study. The purpose of validity test is to determine whether the measure or indicator used contains all the features or ideas that should be in the aspects measured in the study. Module validity refers to the accuracy of the concepts and content of a module. Russell (1974) notes that the validity of a module should have five conditions: meeting the target; adequate time; can be implemented easily; capable of improving performance achievement; and modules can be taught to change the students' attitudes. The developed module is sent to the experts for the purposes of testing the content validity. The validity of the module is necessary so that the module content really helps the student to master the stated objectives (Jamaludin, 2016).

2. Reliability

Creswell (2012) states that the validity test process should be completed before making the reliability test. Therefore, after receiving the experts' opinions and comments, the

MIMP module is tested for its reliability, so that the module's built-up activities can be adopted in the long run. In addition, the module activities are expected to change the students' behaviors and mindset: they would be more motivated in their learning, and attain a higher level of achievement. For the purposes of testing the module activities' reliability, the researchers need to know how well the students can follow the steps of each planned activity. By observing the performance of the steps in every activity of the module, the researchers can determine the students' extent of mastery of the module activity's objectives. Therefore, to ascertain the reliability coefficients of a module's activity, question items are designed based on the module activity steps or the objectives of the module activity (Jamaludin, 2016).

III. RESEARCH METHODOLOGY

Research Design

The design of the study is quantitative by using the survey method. The validity of the module is determined by the appointed experts while the reliability of the module is determined by the students who participated in a module pilot study. The eight experts carrying out the validity test of the MIMP module content consist of three HS content experts, two module experts, two ICT experts and one Malay language specialist. The module content validity questionnaire was adapted from the work of Russell (1974), and given to the experts to fill in and calculate its percentage value. The experts are free to give their comments, personal views, feedback and suggestions in the space provided; all this information is useful to the researchers for strengthening the module activities. A total of 37 form-four HS students from a school in Miri Division were selected to participate in the module pilot study, to determine the reliability of the module. All the respondents are female, 10 Malays, eight Chinese and 18 Sarawak natives. This pilot study also aims to assess the suitability of the module in the aspects of time, activity, student situation, teaching aids and equipment, and other problems that can be considered for module improvements.

Research instrument

The instrument used in this study is the validity questionnaire of the module content and the reliability questionnaire of the module activity. The module content validity questionnaire forms are given to the experts to evaluate the module content, while the module reliability questionnaire forms are given to the students to evaluate the reliability of module activities.

Data analysis

Questionnaire forms validated by the experts are collected and analyzed; the percentage value is calculated by using the following formula. If the percentage obtained is more than 70, it means the module activity has a good content validity (Jamaludin, 2016).



$$\frac{\text{Total Expert Score (x)}}{\text{Maximum Score (25)}} \times 100\% = \text{Level of Module Percentage}$$

The analytical tool used to measure the reliability of the module activity is alpha cronbach; this is a common procedure used to measure the item reliability when employing the SPSS program. The values of alpha cronbach indicate the suitability and relationship of items in a set of questions. If the value approaches one, it means the instrument is reliable, good and effective. In the context of this study, the researcher refers to Hair, Black, Babin and Anderson(2009) opinion: if the alpha value reaches .70, the instrument is considered sufficiently reliable.

IV. RESEARCH FINDINGS

Based on the analysis results and views of the eight experts, the MIMP module has a good average validity of 82.5 percent. The details of the data analyzed are described in the table 1 below:

Table. 1 Percentage Analysis of MIMP Module Content Validity

Module Content Aspects	Percentage (%)
The content of this module.....	
keeps the population target.	95
can be implemented perfectly.	80
corresponds to the time allocated.	70
can improve student performance.	85
can change the attitude of the student in a more brilliant direction.	82.5
Average	82.5

The views and comments columns that accompany the content validity questionnaire are intended for gathering the experts' feedback related to the MIMP module. The experts give their comments in the space provided for the purpose of improving the module developed. All the experts' suggestions for improvements are recorded by the researcher, so that the developed module has good validity. The Alpha Cronbach's analysis shows that the reliability of the module activity is very good, with the value of .92. Alpha Cronbach values based on the substandard module content are also taken into account. The reliability of the sewing process content is .89, drafting the vest and the blouse pattern is .86, the sewing material inventory is .78 and the vest and blouse production is .70. The findings of the analysis show that each module's submodule has fulfilled the reliability value of the module (Hair et al., 2009; Fraenkel & Wallen, 1996).

V. DISCUSSION

1. What is the validity level of the MIMP Module?

The module was evaluated by eight experts from various fields, namely module development, Home Science, ICT and Malay Language. Based on the score given by all the experts, the MIMP module has a good validity of 82.5 percent. This proves that the instrument has measured what needs to be measured, and the module has been successfully

developed to achieve its goals as the validity value of this module is more than 70 percent (Jamaludin, 2016). With the actual MIMP module validity value of 82.5 per cent, it is evident that the modules developed by the ASSURE model are valid, good and effective. This is in line with Jamariah and Loy (2017) statement that the modules developed using the ASSURE model have a validity value of more than 70 percent.

2. What is the reliability level of the MIMP Module?

The reliability of the MIMP module activities has been tested through a pilot study. The findings of the Alpha Cronbach test analysis show that the module has a high reliability value of .92. According to Ramlee et al., (2016), alpha values approaching one indicate that the instrument is reliable, good and effective. The instrument is sufficiently reliable if the Alpha value of reliability reaches the value of .70 (Hair et al., 2009; Fraenkel & Wallen, 1996). The findings show that the development of the MIMP module is consistent and acceptable.

VI. CONCLUSION

The 21st-century learning places a great deal of emphasis on the elements of information and communication technology, as well as the components of the student learning strategy, and a variety of learning context. It covers many aspects of how teachers use the information and communication technology to carry out more effective and qualified teaching and learning, and emphasizes student-centered learning approaches. The teaching and learning approach based on the MIMP module is one of the mediums that can help teachers achieve PAK-21. The researcher hopes that the interactive multimedia module can enhance the cognitive, psychomotor and affective capabilities of the students in the teaching and learning of making clothes. Hopefully this research will be useful to the MOE to produce human capital that is balanced physically, emotionally, spiritually, intellectually and socially.

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