

The Validity of the Monitoring Kit (Courseware) for Basic Electrical Wiring Training among Malaysian Premier Polytechnics

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Abstract

This research is done as to test the validity of the content in the Monitoring Kit (Courseware) for the basic electrical wiring training. A set of questionnaire of the validity of the module's content based on Russell (1974) contains 18 questions. The design review with the questionnaire using Likert scale is implemented on five expert panels through intended sampling. All five experts are required to fill the fixed characteristics such as they must be the lecturers in polytechnics, must be teaching in the electrical field, have the teaching experience of more than years and also their consent to be included in this study. Results show that the developed courseware has a high validity of 96 percent. However, there are several aspects to be improved before the Monitoring Kit (Courseware) is used during the teaching and learning session in the classroom. Thus, Monitoring Kit (Courseware) product can be proceeded by doing a pilot study using Monitoring Kit (Courseware) on the students from Electrical Engineering Department in Malaysian Premier Polytechnics.

Keywords: Validity, Courseware, Module, Monitoring Kit, Learning Aid, Electric, Teaching And Learning

Introduction

Validity is the ability of a measurement to measure the real value of a concept in a hypothesis. Validity refers to the concept of measuring what is supposed to be measured (Berawi, 2017; Konting, 1990). Darusalam and Hussin (2016), states that the higher the value and the level of validation, the more concrete the data acquired to produce a good quality research. According to Azman and Mustapha (2016); Noah and Ahmad (2005), validity could be marked high if the built instruments are really able to truly measure the concept stated in the hypothesis. Hashim, Ramli (2007), states that researchers are required to ensure that the tools and instruments are built with a certain level of validation. This means that the research

results will be meaningless if the measuring tools used are not able to measure what they are supposed to measure. Hence, every measured aspect needs to fill the required characteristics and specifications.

A module's validity refers to the accuracy of the concept and the content of the module. This is because the measuring tool and module are the tools, sources and materials that would guide a module designer to get various information and data regarding the studies and researches done (Noah & Ahmad, 2005). Thus, Konting (2000) recommends that the researchers who are developing modules should get feedbacks and opinions from the experts to determine the validity of the module. This is in line with what is stated by Effendi, Idris, Rahman and Khairani (2017), who says that the validity of the content is usually measured with experts' evaluation that would look into the agreed scale for every content measured. The content validity of the module would be considered good if it can measure all of its content accurately.

Literature Review

Electrical Technology is one of the programs offered in most Malaysian polytechnics. It is an important program in shaping students' future career. However, there are several problems that emerge during the teaching and learning process, especially in the Basic Electrical Wiring Course. Graduates are said to be unable to show the ability required by the working sector nor do they are able to master the level of excellent social morality skill in the society (Hussain et al., 2008).

One of the factors that contributes to this is the lack of facilities that cause the process of teaching and learning to only be carried out traditionally. Observations are done in between the electrical lecturers. It is stated that the teaching and learning process of the course only includes the traditional method with whiteboard as the teaching aid and the teaching method used is only the teacher and student centered learning. Results from the study done by Arsat dan Rasid (2010), show that the respondents agreed that interest is important to prepare the students of Electrical and Electronical Engineering in shaping their own future career. Hence, the courseware for the basic electrical wiring is developed. However, the aspect that should be focused on more in this courseware development is the validity of the content, in order to produce a high quality courseware.

Methodology

This research was carried out using experimental design method and observational quantitative approach. Researchers analysed the validity from experts quantitatively through cumulative scores. While planning on developing the courseware (monitoring kit), researchers had carried out library based research beforehand. Then, the validity of the module was carried out to elicit some thoughts and feedback from the chosen experts. According to Lawshe (1975), the term expert is to be mentioned as Content Evaluation Panel. The experts are those who are involved with the researched field to help determine the suitability of the developed content (Effendi et al., 2017). The experts were chosen based on the criteria such as the fields, amount of published and experience in their work (Rubio, Berg-Weger, Tebb and Rauch, 2003).

Meanwhile, the number of expert panels depended on the level of expertise and knowledge of the experts. Quite a number of panels were chosen in the past. According to Darusalam and Hussin (2018), the number of panels should include at least three people from the field. This is in line with the opinion from Rubin et al., (2003) and Lynn, (1986) who

suggested that at least three experts for each field is sufficient. The previous works had shown that various numbers of panels were used in researches, as in the research carried out by Ibrahim, Arip and Bitamam (2014), three expert panels were involved while in the research by Yahya, (2015); Ghani and Aris, (2012), four experts were involved.

Table 1 :
Biodata of the Validity Experts Panel

Num.	Expert Field	Experience
Panel 1	Electrical Engineering	<ul style="list-style-type: none"> - A lecturer in Malaysian Polytechnics -28 years of teaching experience in the field -Vocational Training Officer (VTO) -Safety Journal in wiring workshops
Panel 2	Electrical Engineering	<ul style="list-style-type: none"> - A lecturer in Malaysian Polytechnics - 16 years of teaching experience in the field
Panel 3	Education in Electrical Engineering	<ul style="list-style-type: none"> - A lecturer in Malaysian Polytechnics - 25 years of teaching experience in the field
Panel 4	Education in Electrical Engineering	<ul style="list-style-type: none"> - A lecturer in Malaysian Polytechnics - 17 years of teaching experience in the field - Research on Worker's Safety and Health Act 1994 - CIDB Competency Certificate
Panel 5	Electrical Engineering	<ul style="list-style-type: none"> - A lecturer in Malaysian Polytechnics - 16 years of teaching experience in the field

In the context of this research, content validity was given to five person experts that who were chosen through intended sampling. The choosing criteria of the panels include (i) lecturers in polytechnics, (ii) are teaching in electrical field (iii) have an experience of more than ten years (iv) the consent from the experts to be included in the research. All six expert panels should fulfill these characteristics that fixed by the researcher. The validity of the experts was carried out to determine whether the content of the module could really be tested based on the construct that was supposed to be measured (Goodwin, 2007). Table 1 had shown the biodata of the panels involved in this research.

A questionnaire on the validity of the module's content based on Russell (1974), had been altered and given to the panel of experts for them to evaluate the content of the developed module. The evaluation was done using Likert scale with ten chosen points of (1) representing totally disagree and (10) representing totally agree. Noad and Ahmad (2005),

stated that the validity questionnaire is built specifically to test the validity of the content of certain module and the high validity of content of 70% would be considered to have mastered or achieved the highest level of validation. A good content validity is determined by the evaluation percentage from the panel of experts chosen through the questionnaires, given out using the formula below:

$$\text{Mastery Level of Content Validity} = \frac{\text{Total Experts Score}}{\text{Total Score}} \times 100\%$$

Data Analysis

Based on the result obtained by all of the experts, the validity value of the developed courseware for basic electrical wiring is as shown in Table 1. Result shows that the minimum percentage of the validity is 94 percent while the maximum percentage of validity is 100 percent. Based on the overall percentage analysis, the developed courseware content is at 96 percent. meanwhile, the validity value has surpassed 70 percent. This is same opinion with Noad and Ahmad (2005), who stated the content validity of a module has achieved a high level of validity as the percentage surpasses 70 percent. This shows that the developed courseware content can be trusted and has a high consistency because the courseware is developed based on the syllabus. It can also solve the problems faced by the students and teachers in the teaching and learning process.

Table 2 :
The Validity Value of The Overall Courseware

Num.	Statement	Validity (%)					Percentage (%)	Experts' View
		1	2	3	4	5		
1.	Courseware helps students to solve problems.	100	100	90	100	90	96	Accepted
2.	Courseware is suitable to be used as teaching materials.	100	100	90	90	90	94	Accepted
3.	Courseware encourages self learning	100	100	90	90	90	94	Accepted
4.	Courseware helps in increasing students' understanding	100	100	90	100	90	96	Accepted
5.	Courseware helps to solve a practical problem faster	100	100	90	90	90	94	Accepted
6.	Courseware contains of suitable syllabus, in line with the course	100	100	90	90	90	94	Accepted
7.	Explanation of the safety workshop is clear in the courseware	100	100	90	100	100	98	Accepted
8.	The names of the accessories are accurate	100	100	100	100	100	100	Accepted
9.	The accessories used in the courseware are suitable to use	100	100	90	100	90	96	Accepted
10.	Courseware content covers the syllabus	100	100	90	100	80	94	Accepted

11.	Courseware is easy to use in lesson	100	100	90	100	90	96	Accepted
12.	The video displayed is interesting for students	100	100	90	100	90	96	Accepted
13.	Courseware gives an impression to students	100	100	90	100	90	96	Accepted
14.	Courseware reduces accidents in workshops	100	100	90	90	90	94	Accepted
15.	Courseware saves the time to check on the circuit by every student	100	100	90	90	90	94	Accepted
16.	Courseware reduces the use of materials and accessories	100	100	100	90	100	98	Accepted
17.	The words used are correct	100	100	100	100	100	100	Accepted
18.	The language used is suitable with the students' level	100	100	90	100	100	98	Accepted
Overall		100	100	92	96	92	96	Accepted

Conclusions

As a conclusion, this courseware has successfully obtained the unanimous evaluation from the experts in developing it. This research is able to contribute to the production of a courseware that has an evaluated validity. Based on the result, it is proven that the courseware has been developed systematically and according to the procedures to develop a module scientifically. The research process has proven that the courseware has a very high validity value. This is why the courseware is ready to be tested to see the ability and the impact on getting it to be a high quality product. It is hoped that the courseware could be of help in making the process of teaching and learning in the classroom smoother and easier. Other than that, it is hoped that this courseware could increase the students' interest in the electrical wiring course, in order to produce graduates that are capable to excel in their working sector.

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