



Validity and Reliability of Technology Entrepreneurship Module for Public University Undergraduates in Malaysia

Ahmad Syakir Bin Junoh, Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia, syakir@umk.edu.my

Norasmah Binti Othman, Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

Rahim A. Syarizal, Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

Raof M. Nurshadira, Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

Abstract- This study aims to determine the validity and reliability of the Entrepreneurship Module which consists of nine activities (Introduction to Technology Entrepreneurship, Business Opportunities and Creativity and Innovation, Small and Medium Enterprises, Business Models, Business Planning, Marketing, Research and Development, Research and Development Commercialization), Intellectual Property Management). Data were obtained through a survey using two sets of questionnaires. The content validity questionnaire was completed by eight experts (two module experts and six field experts) while the reliability questionnaire set was distributed to 30 undergraduate students at Universiti Malaysia Kelantan. Selection of respondents using purposeful sampling method. Module reliability is based on Cronbach's Alpha value, while module validity is based on percentage calculation. Expert evaluation shows that the module tested has a high content validity of more than 70 percent. Similarly with the reliability analysis, the Cronbach's Alpha value exceeding 0.7 indicates that the module reliability is high. The findings of the study can be concluded that all sub-modules for the Technology Entrepreneurship Module have high validity and reliability and are ready to be implemented for effectiveness testing.

Keywords: First Keyword, Second Keyword, Third Keyword.

I. INTRODUCTION

Modules are built for various purposes including helping the teaching and learning process, increasing motivation, raising the level of leadership and others (Sidek Mohd & Jamaludin Ahmad, 2005). Module refers to a written document that discusses the concept and knowledge in the form of small units, with the aim of enabling module users to master a knowledge before continuing learning in the next unit (Jamaludin Ahmad, Aminuddin Hassan, & Norhasni Zainal Abidin, 2008). Modules can improve students' academic achievement and even the use of appropriate modules is used in non-academic teaching (Russell, 1974). A module needs to be clear and easy to understand in order to ensure suitability and usability. The main feature in identifying the suitability and usability of a teaching material or measuring tool is to perform validity and reliability tests. Validity was used to measure the accuracy of the measurements used in the study. Validity determines whether the measurements used include all the features or ideas present in the measured concept. While reliability refers to the concept of consistency and integrity of measurements, measuring tools, survey questions within a certain period of time for a particular measurement. Reliability aims to identify whether a measurement tool gives the same answer when it is used to measure the same concept of the same population or sample or respondent (Chua, 2014).

The method of determining the reliability of a module is the same as the method of determining the reliability of other test devices. This is because modules and test tools are tools that are developed for a specific purpose. Thus, if the reliability measurement of a measuring instrument is determined against the things or tools developed then the same can be applied to determining the reliability of a module (Kam-meyer-Mueller, Judge, & Piccolo, 2008). Determining the reliability of the module has two methods, namely using a questionnaire built based on the objectives in the module or based on the activity steps in the module content. Both of these methods can relate to the reliability of the module (Sidek Mohd & Jamaludin Ahmad, 2005). While to determine the validity of the module content is by using the method of evaluation of experts (module experts and field experts) this coincides with Mohd Majid Konting (2009) that the validity of the module can be determined through expert observation. A module has high validity if the module can be achieved or mastered based on the objectives of the module that has been set. Determining whether a module has high content validity based on Tuckman & Waheed (1981) and Sidek-Mohd & Jamaludin Ahmad (2005) is that the module has a validity value exceeding 70%. Thus, a measurement tool that does not achieve the value of validity and minimum reliability then the module needs to be

redeveloped and even the information taken (tests performed) using the module can not be used (Abu Bakar Nordin, 1995). Measurement tools are calculated consistently and permanently based on reliability tests (Chiang, Jhangiani, & Price, 2015).

Previous studies have shown that modules that are built and adhere to every aspect of the module development model enable the module to get a high value of validity and reliability (Ang & Lee, 2016; Zainiah Mohamed Isa, 2017).

II. PROBLEM STATEMENTS

In Malaysia, awareness of Technology Entrepreneurship is still in its infancy. In addition, aspects of discussion and written documents as well as figures who dominate the field are limited. Therefore, the knowledge related to technology entrepreneurship received by the students in particular gives minimal impact in their lives and even the students get limited knowledge of the knowledge.

The researcher did not find a study related to the construction of modules for technology entrepreneurship courses, therefore the materials or teaching and learning tools of the existing courses need to go through validity and reliability tests.

Furthermore, previous studies such as (Alijah Ujang, 2016; NoorazlinAzlanHadi Tan, 2012; Rashidah Begum Gelamdin, 2016) report the effect of using modules in teaching and learning in terms of helping to improve student achievement and interest in a course or lesson.

III. RESEARCH METHOD

3.1 Module Validity

The validity of the Technology Entrepreneurship Module is derived from the evaluation of eight experts of which two module experts and six field experts. However, the number of letters appointed as evaluators is 11 people but only eight experts who cooperate throughout the module evaluation process is carried out until the calculation is done. Thus, only eight evaluation forms are taken into account in making validity calculations. The evaluation form contains five items with five consent scales. The first item is to assess the suitability of the module to the target population. The second item is to assess the suitability of the module objectives. The third item is to assess the appropriateness of the time of each session. The fourth item is to assess the suitability of the module in enhancing entrepreneurial knowledge among students. The fifth item is to evaluate the application of technology entrepreneurship among students. Researchers received eight module validity assessment forms from eight experts after two months from the date of distribution. Researchers make refinements and improvements to modules based on expert recommendations. The calculation of the score is like the formula formulated by SidekMohd&Jamaludin Ahmad (2005) as shown in Figure 1

$\frac{\text{Expert Overall Score (X)}}{\text{Maximum Score (25)}} \times 100 \% = \text{Module Content Validity}$
--

Figure 1 Module Validity Calculation Formula

According to SidekMohd&Jamaludin Ahmad (2005), quality modules should achieve content validity of more than 70% and if less than 70% of the modules need to be re-evaluated.

3.2 Module Reliability

Technology Entrepreneurship Module is developed with specific objectives such as increasing the knowledge of Technology Entrepreneurship among undergraduate students. Therefore, a total of 30 pre-graduate students were selected to evaluate the module by filling out the module reliability questionnaire. The total number of reliability assessment items was 49 (Table 1) of which the items were reviewed by module experts.

Table 1. Module Reliability Values

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.975	.974	49

The module reliability assessment also uses five agreement scales. Prior to conducting the assessment, the researcher obtained permission from one of the instructors who conducted lectures for undergraduate students at Universiti Malaysia Kelantan to conduct the survey process. The process of data collection for the purpose of evaluating the reliability of the module takes one hour 30 minutes. The reliability questionnaire form was built based on the objectives of each module activity. This questionnaire consists of two parts. Part A is demographic information such as name, gender, program and year of study. Meanwhile, Part B contains 49 items using a scale of agreement 1-strongly disagree and 5-strongly agree. The data obtained from this study were analyzed to obtain Cronbach Alpha values.

3.3 Sampling

The module validity and reliability study involved two groups of samples namely eight experts for module validity as well as 30 undergraduate students at public universities. All selected specialists have at least a Doctor of Philosophy degree in a related field (modules and fields). While the sample of students are undergraduate students at Universiti Malaysia Kelantan who took entrepreneurship courses in the first year of study. Both study samples were selected using the intended sampling method

IV. FINDING

4.1 Validity

Researchers have conducted a validity assessment of the Technology Entrepreneurship module. Based on Table 2, the validity of the module was evaluated by eight experts. There are two categories of experts, namely module experts and field experts. Module experts refer to Doctor of Philosophy degree holders in module construction as well as actively involved in module-based research either as supervisors, speakers and even book writers as well as producing modules from research grants. While field experts refer to academics who have teaching experience for courses related to entrepreneurship, management, finance, marketing, creativity and several other components. In addition, field experts are also experienced in building and validating the syllabus of study courses at the university level. In addition, the researchers ensure that all the specialists selected for this study have at least a Doctor of Philosophy degree to ensure that the characteristics of the experts mentioned above are available. The highest validity percentage of the modules achieved was 96% given by eight module experts. The lowest percentage of module validity is 60% given by module experts two and three. While the other five experts gave the module validity percentage between 76% to 88%. The average total validity of this module is 80%.

Table 2 Module Validity Assessment Score Based on Expert Experts

Expert	Score (X/25)	Validity	Index
1	22	0.88	
2	15	0.6	
3	15	0.6	
4	19	0.76	
5	22	0.88	
6	21	0.84	
7	22	0.88	
8	24	0.96	
Total		6.4	0.8

4.2 Reliability

Module According to Sidek Mohd & Jamaludin Ahmad (2005) to measure the module reliability value index can refer to the module objectives or module steps. In this study, the reliability value is measured based on the objectives stated in each activity. A total of 49 items of questionnaire were developed based on 49 objectives based on the nine activities found in the module. Next the researcher perform a reliability test to obtain a Cronbach Alpha score to measure the reliability of the module. Findings show that the reliability value of the module is 0.975.

V. DISCUSSION AND IMPLICATION

The construction of Technology Entrepreneurship Module is based on Technology Consumption Acceptance Theory, Creativity Theory and Justice Theory. These theories provide guidance to researchers to build activities at the same time in line with the objectives of module construction.

Meanwhile, the reliability index value of this module is .975. While the validity value of this module is 80%. This shows that this module can be applied or applied to middle-achieving students in the Technology Entrepreneurship course. According to some previous researchers such as (Valette, 1977) the minimum coefficient of measurement reliability of a measuring instrument or module activity is .50. Mohd Majid Konting (2009) and Borg & Gall (1983) have stated that the value of the reliability coefficient must be at least .60. Whereas (Hopkins, 1998) has stated that the value of the reliability coefficient of a measuring instrument or module activity is .90. Therefore, the reliability index value of the Technology Entrepreneurship module is above the maximum reliability value of .90, then this module is acceptable and applicable.

The construction of this module follows the model construction model proposed by (Russell, 1974). This module also applies some theories to produce nine activities. Therefore, researchers have complied with the conditions and characteristics in the construction of quality, integrated and systematic modules. At the same time, it is suitable for students with moderate academic achievement. In addition, the formation of this Technology Entrepreneurship Module is expected to be a guide in implementing teaching and learning activities for Technology Entrepreneurship courses. In fact, the study of the construction of this module is in the final process which is the evaluation of effectiveness. Thus, researchers hope that the high value of validity and reliability also contributes to the effectiveness (effective) based on the improvement of academic achievement (technological entrepreneurship knowledge) and also the application of technology entrepreneurship for students who take Technology Entrepreneurship courses in any public university

VI. CONCLUSION

The validity and reliability of the Technology Entrepreneurship Module showed a positive assessment, therefore the researchers also expect the same result of the final evaluation in the construction of this module, which is the effectiveness assessment as well as achieving the objective of the study which is to improve pre-student academic achievement.

REFERENCES

1. Abu Bakar Nordin. (1995). *Penilaian Afektif*. Masa Enterprise. Retrieved from <https://books.google.com.my/books?id=xwfqAAAACAAJ>
2. Alijah Ujang. (2016). *Pembangunan Modul Pembelajaran Webquest Pendidikan Kesihatan Untuk Guru Pelatih Murid Bermasalah Pembelajaran*. Retrieved from [http://studentsrepo.um.edu.my/6775/1/ALIJAH_UJANG_\(PHA110029\)-PEMBANGUNAN_MODUL_PEMBELAJARAN_WEBQUEST_PENDIDIKAN_KESIHATAN_UNTUK_GURU_PELATIH_MURID_BERMASALAH_PEMBELAJARAN.pdf](http://studentsrepo.um.edu.my/6775/1/ALIJAH_UJANG_(PHA110029)-PEMBANGUNAN_MODUL_PEMBELAJARAN_WEBQUEST_PENDIDIKAN_KESIHATAN_UNTUK_GURU_PELATIH_MURID_BERMASALAH_PEMBELAJARAN.pdf)
3. Ang, C. T., & Lee, L. W. (2016). JuKu INSTRUMEN PENILAIAN KUALITI UNTUK MODUL PENGAJARAN: PENGUJIAN CIRI PSIKOMETRIK. *Jurnal Kurikulum Pengajaran Asia Pasifik*, 4(4), 25–43.
4. Borg, W. R., & Gall, M. D. (1983). *Educational Research an Introduction*. Longman Publishers. New York.

5. Chiang, I.-C. A., Jhangiani, R. S., & Price, P. C. (2015, October 13). Reliability and Validity of Measurement.
6. Chua, Y. P. (2014). *Kaedah Penyelidikan. Mc Graw Hill* (Ketiga). Shah Alam, Malaysia.
7. Hopkins, K. D. (1998). *Educational and psychological measurement and evaluation*. ERIC.
8. Jamaludin Ahmad, Aminuddin Hassan, & Norhasni Zainal Abidin. (2008). Developing, Validity and Reliability of A Drug Addiction Module Among Drug Addicts Are Undergoing Treatment At Rehabilitation Centre. *The Journal of International Social Research*.
9. Kammeyer-Mueller, J. D., Judge, T. A., & Piccolo, R. F. (2008). Self-esteem and extrinsic career success: Test of a dynamic model. *Applied Psychology, 57*(2), 204–224. <https://doi.org/10.1111/j.1464-0597.2007.00300.x>
10. Mohd Majid Konting. (2009). Kaedah Penyelidikan dalam Pendidikan. In *Kaedah Penyelidikan Pendidikan*.
11. Noorazlin Azlan Hadi Tan. (2012). *Pembangunan Modul Akademik "Modul Basic of Electric and Electronic - Capacitor."* Universiti Teknologi Malaysia.
12. Rashidah Begum Gelamdin. (2016). *Pembangunan Modul Bioteknologi Bagi Mata Pelajaran Biologi Sekolah Menengah*. Universiti Malaya.
13. Russell, J. D. (1974). *Modular Instruction: A Guide to the Design, Selection, Utilization and Evaluation of Modular Materials*. ERIC.
14. Sidek Mohd, & Jamaludin Ahmad. (2005). *Pembinaan modul: Bagaimana membina modul latihan dan modul akademik*. Penerbit Universiti Putra Malaysia.
15. Tuckman, B. W., & Waheed, M. A. (1981). Evaluating an individualized science program for community college students. *Journal of Research in Science Teaching, 18*(6), 489–495. <https://doi.org/10.1002/tea.3660180603>
16. Valette, R. M. (1977). Modern language testing.
17. Zainiah Mohamed Isa, J. B. & M. C. M. (2017). Kesahan Kandungan Modul Literasi Awal (Modul Lit-a) Pada Peringkat Kanak-Kanak Berumur 2+, 3+ Dan 4+ Tahun. *Jurnal Pendidikan Awal Kanak-Kanak, 6*(1966), 56–68.