Verifying and Assessing the Reliability of the Learning Module of Positive Design and Innovative Technology in the Integration Approach of Spiritual Knowledge

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ABSTRACT

This study was carried out to determine the validity and reliability of the learning module known as The Learning Module of Positive Design and Innovative Technology in The Integration Approach of Spiritual Knowledge (PRBTIFIIS). The PRBTIFIIS module has been built to develop the positive innovative thinking of Form 2 students through a knowledge integration approach with the application of the value of trust and obedience to God, human responsibility as a servant and caliph. The PRBTIFIIS module is built based on the Sidek Module construction model that uses the basic theory of Reverse Maslow's Theory, and Sidek's Learning Theory. A level of validation of the module content was carried out by five experts in the studied field. The content validity of the PRBTIFIIS Module is calculated using the Tuckmen and Waheed Level of Mastery Validity formula. The data obtained is 98.7%. The reliability of the module was obtained from 16 second-grade students who participated in the implementation of the pilot study. The Cronbach's Alpha score obtained for the reliability of the module was 0.97. The findings of the study show that the developed PRBTIFIIS Module has high validity and reliability and the PRBTIFIIS module is available to test its effectiveness.

1. Introduction

Thinking that can produce something or a useful product is known as positive innovative thinking. The process of changing something that already exists by adding value to improve the quality of products offered to consumers is known as positive innovation [33]. Positive Innovative Thinking means fully using the ability of the mind to produce something new and beneficial for oneself, society, and the environment [5]. Positive innovative thinking is important to create excellent,

knowledgeable, and skilled human capital that can contribute ideas to the progress and development of the country [9,20].

In 2017, the Secondary School Standard Curriculum replaced the Integrated Life Skills subject with the Design and Technology subject for form one students in secondary schools. Therefore, students need to master Design and Technology subjects to be able to use the knowledge, skills, and principles of Design and Technology in making decisions, being innovative, solving problems, and creating something new. RBT is centered on the mastery of knowledge, skills, and spirituality as well as attitudes [21,24]. However, the innovative development process only prioritizes cognitive, affective, imagination, and practice (psychomotor) but there is no application of spiritual elements. which gives individuals complete freedom to present their products. This will cause them to lose their way.

Therefore, there needs to be an integration of knowledge between innovative development and spiritual aspects, which is an important component and the main guide for the innovative decision-making process [11]. A study by Nur Syafiqah and Nurul Nazirah [8] shows that the use of graphics as a teaching aid in the subject of RBT can increase students' interest and understanding. Despite this, this study does not focus on the application of spiritual knowledge in the learning process [2]. Therefore, students need to be absorbed in positive innovative elements with an approach of spiritual knowledge integration in teaching and learning. This aims to produce students who can make meaningful contributions to themselves, society, and the environment, without neglecting God's demands.

RBT students and Malaysians have potential in terms of innovative thinking abilities. The government needs innovative human capital for the progress of the country that has future changes and can meet the increasingly complex needs of customers [34]. Today's world needs human capital that can shape this Industrial Revolution 4.0 to be more beneficial. Therefore, students need to be prepared to face the challenges of this industrial revolution 4.0 in order not to fall far behind with today's technology and competition at the global level [36]. It is clear that to achieve the goal of a creative and innovative country, learning that applies positive innovative elements must be designed and implemented in a planned and systematic way.

Therefore, to produce a generation with positive innovative thinking, students need to be educated with spiritual knowledge to connect knowledge, personality, and skills so that they can create products that benefit and not harm society [11]. Through positive innovative thinking, humans can produce inventions from raw materials such as ordinary iron to cars, airplanes, ships, and submarines that provide convenience to the public [5]. Therefore, positive Innovative Thinking is very necessary to help the country's growth and progress.

However, the negative innovative thinking that is increasing nowadays is very worrying for all parties. Negative innovativeness is a phenomenon where individuals produce innovative things that are initially considered positive but damage the ecosystem or societal norms. This phenomenon has become a hot conversation in society and mass media recently, especially in the fields of science, technology, and engineering. Negative innovative effects not only on individuals but also on society as a whole. The negative impact of this innovation also extends to the organization, the country, and the community in the long term. Studies show that negative innovation can have significant adverse effects on society and the environment. For example, in the context of the use of technology, the impact of the use of applications such as TikTok also has an impact on students' lifestyles. The use of this application is not only for entertainment but also affects the way students manage their time and daily activities [6].

As the best step, learning means that there needs to be an application of spiritual knowledge. Cultivating creativity and innovation integrated with spirituality is still not very prominent, while awareness of activities involving creativity and innovation is at a low level and needs to be improved

[32].The separation process between the development of intellectual knowledge and spiritual knowledge about belief and confidence in the existence of the Creator is known as secularization [35], in the context of Malaysia which is concerned with the way religious life, then the value of belief in God which is the basis of the National Education Philosophy should be effectively applied to students during the teaching and learning process.

In line with that, all subjects must have the application of spiritual knowledge and not only focused on Islamic and Moral Education subjects but must be applied in all subjects [21]. The application of spiritual knowledge across the curriculum is contained in the Integrated Secondary School Curriculum (KBSM) in 1989. Spiritual elements across the curriculum are applied to strengthen skills and human capital skills as desired in the Malaysian Education Development Plan 2013-3025 [24]. When the spiritual application is implemented in RBT subjects, it can develop positive innovative thinking better.

Therefore, based on the research discussed and realizing the importance of the knowledge integration approach, there needs to be a teaching and learning guide for Design and Technology subjects based on the knowledge integration approach. The results of a study by Zamri and Nurfaradilla [14] show that teachers need additional courses and good modules to help them carry out teaching and learning in the classroom. In addition, the teaching and learning process needs to be planned by the teacher systematically and structured in the form of modules. Besides, teachers also need to use appropriate methods to produce the Design and Technology learning process to develop positive innovative thinking with a more meaningful knowledge integration education approach.

1.1 Problem Statement

The negative innovative thinking that is increasing nowadays is very worrying for all parties. Among the negative innovative examples that occurred from January to November 2023, the Department of Investigation and Traffic Enforcement (JSPT) issued 33,996 summonses for various motorcycle modification offenses across the country. Motorcyclists will usually modify vehicles at will without following the standards set by the authorities [15]. The effect of modifying the motorcycle caused the motorcycle to be confiscated by the authorities. In addition, motorcycle owners will be fined and have to be changed back to the original specification and taken for inspection by the Road Transport Department (JPJ) to obtain approval. The process of modification and fines require high costs. Illegal motorcycle modification results in a waste of money, time and personal and community safety.

In addition, negative innovation can have significant adverse effects on society and the environment. In the context of the use of technology, the impact of the use of applications such as TikTok also affects the lifestyle of students. The use of this application is not only for entertainment but also affects the way students manage their time and daily activities [6]. If negative innovative actions are not regulated it will cause the country to lose its workforce, the country suffers losses and costs increase. Weaknesses that occur in the mastery of science and technology lead to moral and personal failure of students which is a very serious problem at present [27]. This problem occurs due to many factors. Among them is that the curriculum in the national education system prioritizes the aspect of academic excellence based on exams while ignoring the spiritual aspect, pushing students towards negative innovation [25]. Although there is the application of spiritual aspects during the teaching and learning process, spiritual application is given less attention [35].

Therefore, the effort to produce students with creative and innovative thinking should touch on spiritual development that will provide valuable guidance to the development of the creative thinking

system in a positive way [12]. In connection with that, in the context of Malaysia which is concerned with the religious way of life, the value of faith in God which is the basis of the National Education Philosophy needs to be emphasized during the learning process so that students can appreciate these values more effectively. This is also because education is a key aspect in producing individuals who have the potential to contribute to the success of students in the local community and then the country [3]. Therefore, the formation of a module that integrates spiritual knowledge in the subject of RBT is seen to coincide with the need to produce students who have positive innovative thinking because education is a branch of effort in forming perfect human beings who are able to guarantee the well-being of the country.

1.2 Research Objective

This study aims to build, implement, and test the validity of the PRBTIFIIS module among Form 2 students in national secondary schools. In particular, the objective of this study is to;
1. Testing the level of content validity and reliability of the module according to the expert panel's opinion on Design the Learning Module of Positive Design and Innovative Technology in The Integration Approach of Spiritual Knowledge (PRBTIFIIS).

2. Literature Reviews
2.1 Concept of Knowledge Integration

This concept of integration guides people in their daily actions and deeds. This happens when the axis of the concept of integration is based on the knowledge of revelation (Al-Quran and As-Sunnah). The concept of integration in education can help the next generation face all future challenges whether from within or abroad [10,13]. The science of revelation tells people to use the mind and heart to contemplate and take lessons from all the events of the universe and all the creations of Allah s.w.t with a wise mind and heart [16]. Education that involves balanced and integrated development is a very important factor for the survival of students in facing the challenges of life with the cleansing of the soul, heart, intellect, and spirit based on religious knowledge as the basis for the development of positive innovative thinking.

2.2 Research Theory

The PRBTFII module developed is based on three main theories, namely Maslow's Reversed Theory, the Constructivism Learning Theory by Vygotsky [29] and Sidek's Learning Theory [25]. These theories have a way and process to give an understanding of the formation of positive innovative thinking in terms of knowledge, attitude, and student skills based on the knowledge integration approach. The module developed is also based on the Directed Creative Process Model [39]. The theories and models used are used as a solid foundation and guide in developing the PRBTFIIS module by the level and development of second-form students.

When Maslow's theory is reversed, the process of human development needs to begin with an awareness of the essence of self and the purpose of life, which is spiritual development [24]. When spiritual development is perfect, it will encourage people to be responsible for themselves so that they always improve in a better direction. Next, humans will be responsible to society and love nature and all creatures on this earth so that they are always in good condition. When the foundation of human spiritual development is strong, then advanced and progressive people will be born. Every

action must have Ihsan, that is, every action done has an awareness that always receives God's guidance and carries out actions in a way that pleases God [19].

Next, the selection of Sidek Theory Learning [25] because the learning process takes place comprehensively and is integrated from the aspects of knowledge, attitudes, and skills and is not separate and focused on the concept of Islam. The concept of learning Sidek Theory, through knowledge, means being able to produce students who are aware of the reality of human events and finally be able to produce students who have faith and confidence in God, positive innovative skills, and noble character. The concept of learning brought by Sidek's Theory consists of four stages, namely the process of discovery, understanding, practice (appreciation**)**, and receiving meaning. From the foundation that is built, cultivated values and ethics, then practiced through behavior, attitudes**,** and actions can reflect in character and personality is a high manners image of human construction. The learning concept brought by Sidek can help teachers implement teaching and learning that is very interesting, easy to understand**,** and not boring to students. The theoretical framework in module development can be illustrated in Figure 1.
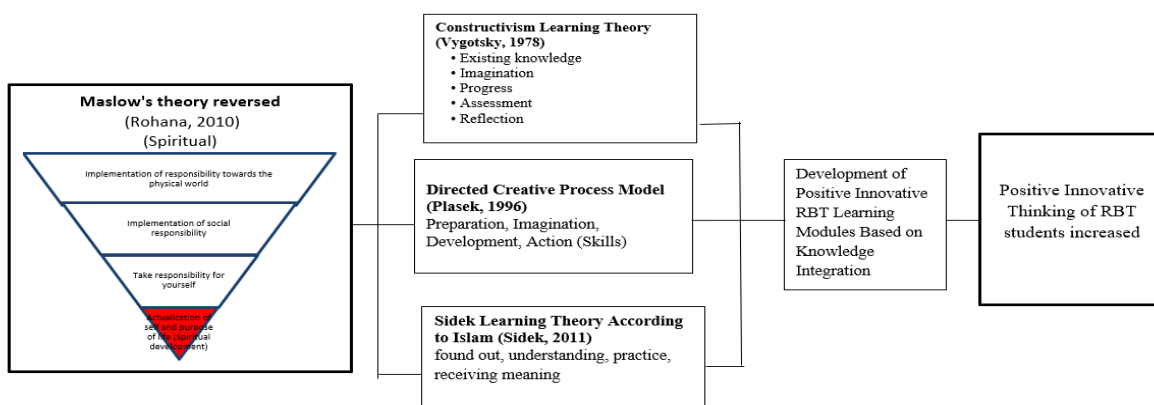

Fig. 1. Theoretical framework of the study

3. Methodology
3.1 Model Development of Sidek Module

PRBTIFIIS module construction using the Sidek Module Construction Model. Although there are differences between models in the construction of modules in terms of the procedures used, the main purpose of all these approaches is to produce high-quality and systematic modules [26]. Sidek's Module Construction Model has two stages, the first phase is the draft stage while the Second phase concerns the stage for module validation [10].

The first phase is to prepare a draft module while the second stage is to try and evaluate the module In the first stage, nine steps need to be done sequentially to prepare a draft module, such as goal development, identifying theory, rationale, philosophy, concepts, targets and duration, requirements research, setting objectives, content selection, selection strategy, logistics selection, media selection and merging draft modules. The word draft is used because this module has not yet proven its validity and reliability. The draft of this module goes through stage II of construction which is the stage of trying and evaluating the module. In stage II, the draft module that has been developed will go through a pilot study to determine its validity and reliability. If it is proven that this draft module has high validity and reliability then it can be considered as a completed module. A diagram of the construction model of the Sidek Module can be referred to in Figure 2.
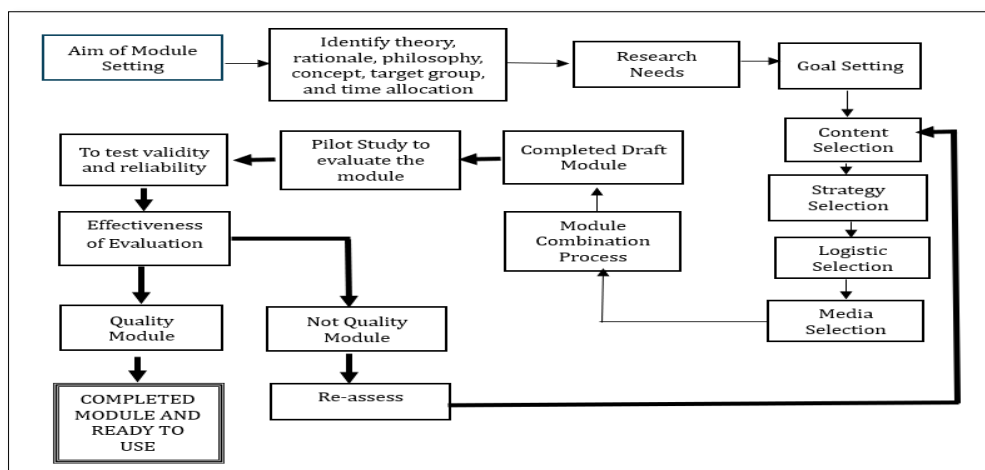
Fig. 2. Sidek Module Development Model

Note: ———— Phase I module construction, prepare module drafts

▬▬▬ Level II module construction, testing, and evaluating modules

3.1.1 Phase 1: Production of draft modules

In the first stage, determine the goals of this learning module to be developed. The construction of goals is a very important thing in the construction of a module. The main goal of this module is to be used as a guide for teachers and students during the teaching and learning process in the subject of Design and Technology (RBT) level two chapter one. Next, followed the identification of the applied theory, the rationale for this learning module to be developed, the philosophy, the concept of learning using the module, the target user, and the time required to develop this learning module. Next, the second stage in phase 1 is to identify the concept, target, and period. The process of identifying concepts is important in the development of a module to show the uniqueness of the module developed according to the agreed concept. Target identification is also very important in the construction of a module to determine the appropriate learning approach, method or strategy to be used based on the maturity level of the targeted student. The process of identifying the period is also very important because the module produced is to be used during the process.

The third stage in this phase is a needs analysis study conducted to obtain information to help researchers develop modules that meet the needs of users. Among the needs studies carried out are the needs studies of users, topics that are difficult to teach, existing modules, and delivery methods. The study was conducted on RBT teachers who teach second-level to obtain information about the subjects involved. After that, the fourth stage is objective setting. the researcher makes decisions about the objectives of PRBTFII module development based on goals and targets. Objectives should be measurable and accessible to users. Next, the fifth stage is the content selection. The selection of content is done to meet the accuracy that matches the target's requirements in achieving the objectives of the module that have been stated. strategies used in the learning module developed.

The sixth stage in this phase is strategy selection. As for the selection of learning strategies, it is adapted to the taxonomic level, which is cognitive, psychomotor, and effective which has been selected to achieve an effective level of learning. The seventh stage is the selection of logistics. At this stage, it is about the format, paper size, and the use of content titles that are appropriate for each session. Then followed by the eighth stage which is media selection. The selection of media is about the determination of the front cover depicting the subject of the module, the combination of diagrams and tables in the writing of the module, the use of bright medium colors, and the format

and size of the writing. The last stage, which is the ninth in this phase, is the consolidation of the module draft. A draft module consolidation is a complete module consolidation that includes front covers, learning sessions, reinforcement exercises, and reference resources. Stage 1 ends with the validation of the draft module after all the steps in this stage are implemented. After combining the draft modules, the second stage is carried out by testing the validity and evaluation of the modules.

3.1.2 Phase 2: Validation and reliability of the PRBTFIIS Module

Selection of module experts for the validation of the PRBTIFIIS Module using the 'snowball' method, the initial individuals interviewed will suggest the names of individuals who are relevant to the field of study and can be referred to [18]. Experts who are directly involved in the issues under study which are based on the fields of Knowledge Integration Education, Technical and Vocational Education, and Islamic Education. The selection of external evaluators who are experts in the field being studied to ensure that the domains contained in the measurement tool represent the field being studied. Experts review the content, answer the module content validity questionnaire, and then comment on the validity of the PRBTIFIIS Module content. Experts also comment on the content validity of the PRBTIFIIS Module.

Validation Process

Selection of module experts for the validation of the PRBTIFIIS Module using the 'snowball' method, the initial individuals interviewed will suggest the names of individuals who are relevant to the field of study and can be referred to. Experts who are directly involved in the issues under study which are based on the fields of Knowledge Integration Education, Technical and Vocational Education, and Islamic Education. A measuring tool or instrument is valid when the construction of the tool fulfills or fulfills the function and objective of its construction [7]. The expert will review the content, answer the module content validity questionnaire, and further comment on the validity of the PRBTIFIIS Module content. Experts also commented on the content validity of the PRBTIFIIS Module.

In the context of content analysis, reference to Russell's Model, has been used as a measurement to test the conceptual accuracy and validity of the content of a module. Among the validity items of the module content which has five points are meeting the target population, the teaching situation or the method of implementing the module is appropriate, sufficient time, the module succeeds in increasing student achievement in the recommended aspects, and the module succeeds in changing the student's attitude towards excellence. This is in line with the content validity process carried out by Muhammad Afzamiman [38] to determine the level of validity of the module in the study. All the selected experts have read, researched, studied, and provided views and suggestions on the module. To determine the level of validity of the module content, the total score filled in by the expert (x) will be divided by the total actual score (25) and multiplied by one hundred. A module is confirmed to have high content validity when proven to obtain 70% and is considered to have mastered or reached a high level of achievement. This means, if the percentage obtained by the PRBTIFIIS module exceeds 70% then the PRBTIFIIS module has high content validity. The formula is as follows:

$$\frac{\text{Total Score Expert (x)}}{\text{Maximum Score (y)}} \text{ X } 100\% = \text{Content Validity Achievement}$$

Fig. 3. Formula for content validity achievement

Reliability Measuring Process

The reliability of the module is done through a questionnaire based on the objectives of the module or steps in the module using the Kuder-Richardson method which is based on the standard deviation known as Cronbach's alpha. The finding of a high index is 0.8 to 1.0. In addition, the level of reliability of measurement tools is at its best when it reaches ethics and spirituality 0.71 - 0.99.

3.5 Sample

In this study, the sample for the validity of the module consists of five expert module assessors who have been identified who serve in public universities, Teacher Education Institutes, the Johor Bahru district education office, and national high school teachers. The expert group is those who have areas of expertise, experience, and compatibility with the built module. The selection criteria for expertise are knowledge in the fields of Design and Technology, Technical and Vocational, pedagogy, module development, the concept of knowledge integration, and the field of Islamic religion. The selection of the study sample as respondents in this study using the snowball sampling method. The profile of the expert panel can be referred to in Table 1:

Table 1
Expert validity panel profile

No.	Brief Profile	Position and Institute	Expertise
1	Lecturer	lecturer FSSH, UTM	TVET Education
2	Lecturer	Lecturer IPG Campus Darulaman	Integration of Knowledge, Design, and Technology (TVET)
3	Lecturer	Lecturer IPG Campus Temenggong Ibrahim	Pedagogy and Modules
4	Teacher	SISC++, PPDJB	Design and Technology (TVET)
5	Teacher	Senior Subject Teacher, SMK Tan Sri Mohamed Rahmat	Islamic studies

The sample of the pilot study for the reliability of the module consisted of 16 students in form 2 in Secondary Schools (SMK) in the Johor Bahru district who were selected by purposeful non-random sampling. The sample for the pilot study must be from among the respondents who are equivalent to the respondents conducted in the actual study [7]. The selection of 16 RBT students from SMK who have the same school background as the school being studied as a sample using purposive non-random sampling. A total of 15 to 20 samples for the pilot study was sufficient for external validity analysis and reliability index.

The reliability of the module is done through a questionnaire based on the objectives of the module or steps in the module using the Kuder-Richardson method which is based on the standard deviation known as Cronbach's alpha. The finding of a high index is 0.8 to 1.0. In addition, the level of reliability of measurement tools is at its best when it reaches ethics and spirituality 0.71 - 0.99. The results of the Reliability of the module showed a Cronbach's alpha score of 0.97. This score shows that the PBRTFII module has high reliability and can be continued with a real study to evaluate the effectiveness of the module in schools.

3.6 The Learning Module of Positive Design and Innovative Technology in The Integration Approach of Spiritual Knowledge (PRBTIFIIS)

The content of the PRBTIFIIS module can be divided into five sessions, namely knowledge, understanding, practice, practice, and receiving meaning. The following is the main focus and objective of the PRBTIFIIS module can be referred to in Table 2.

Table 2
Contents of the PRBTIFIIS Module

Session / (70 minutes)	Activities	Objective
Session 1	Identify human advantages (humans as slaves)	Knowledge of human responsibilities as servants and caliphs toward positive innovative thinking
Session 2	The importance of social relationships (man as caliph)	students' understanding of the concept of human responsibility as servants and caliphs towards positive innovative thinking
Session 3	The importance of social relationships (man as caliph)	Students practice the concept of human responsibility as a servant and caliph towards positive innovative thinking Importance
Session 4	Advantages of inventions that have contradictions or pairs	Students practice the concept of human responsibility as a servant and caliph towards positive innovative thinking Importance
Session 5	Production of product sketches through positive innovative thinking	The process of accepting the student's meaning about the concept of human responsibility as a servant and caliph toward positive innovative thinking

3.7 Instrument

The research instrument is a set of questions that contain several items that can be measured. The research instrument used in this study is to use a feedback form to facilitate the collection of data from the respondents. The reliability study of the module uses a quantitative approach by using a questionnaire. The questionnaire contains 2 parts which are parts A and B. There are 2 items in part A and 29 items in part B. Part A is about demographics, and part B is about module content. A five-point Likert scale was used to answer the questionnaire. The questionnaire was verified by 5 experts. The validity of the instrument by experts is 100%. Based on expert comments, the researcher has modified and removed some terms used in the questionnaire items. After correcting the questionnaire, the researcher conducted a pilot test on 16 students through the teaching and learning process at school. Therefore, the researcher chose 2nd-grade students because they have almost the same characteristics as the real sample.

4. Results and Discussion
4.1 Results of Validation Analysis

The findings of the content validity study of the PRBTIFIIS module based on Russell's Module content validity questionnaire, which has been modified, the validity value for the entire content of the PRBTIFIIS module can be seen in Table 3 below:

Table 3
Division of validity achievement according to percentage of five counseling experts

Expert	Expert's Score (x/75)	Total of Validity Achievement (%)	Expert Views
1	70	93%	Accepted
2	75	100%	Accepted
3	69	92%	Accepted
4	75	100%	Accepted
5	75	100%	Accepted

Table 3 shows the percentage of content validity of the PRBTIFIIS module that was obtained above 90%, so the PRBTIFIIS module has a high content validity. Overall, the findings show that the content of the PRBTIFIIS module is consistent and compatible with the target of the module.

4.2 Results of Reliability Measure Analysis

The Cronbach Alpha value obtained for each activity in the module is between .85 - .95 with the overall Cronbach Alpha value of the PRBTIFIIS module being 0.97 as shown in Table 4. The result of the overall Cronbach's alpha score of 0.97 shows that the reliability level of the PRBTIFIIS module is at its best when reaching Cronbach's alpha between 0.71 - 0.99. This shows that the internal consistency of the activities of the PRBTIFIIS module developed is high. The findings of the study found that the content of the developed PRBTIFIIS module has high validity and reliability and the PRBTIFIIS module is available to test its effectiveness.

Table 4
Module activity reliability assessment

Session	Title		Alpha Cronbach
1	Identify non-inventive and inventive problems		0.87
2	Functional Analysis Part 1		0.85
3	Functional Analysis Part 2		0.89
4	Physical Contradictions Part 1		0.95
5	Physical Contradictions Part 2		0.91
		Total	0.97

5. Implications
5.1 Design and Technology Teachers

It is hoped that the module developed by the researcher will be able to help Design and Technology teachers apply the educational approach of knowledge integration in teaching and learning. In addition, it can help RBT teachers improve the quality of teaching so that they can attract students' motivation to learn and have positive innovative thinking. Finally, Design and Technology teachers as educators will be able to produce balanced and harmonious human capital based on faith and obedience to God as contained in the National Education Philosophy.

5.2 School Administrators

The module developed will be able to help school administrators as a guide to producing teachers who can implement the educational approach of knowledge integration in the teaching and learning

process, especially for the subject of RBT and generally for other subjects. The module has the application of the value of trust and obedience to God, so it can produce students who are knowledgeable, skilled, noble, and responsible as contained in the National Education Philosophy.

6. Conclusion

In conclusion, based on the discussion of findings through expert feedback, this study is suitable as material that can be used in the learning process of RBT subjects with a knowledge integration approach. However, improvements can be made to some items in the module in terms of design and module content. The findings of the study, this study has enabled the researcher to get an overview of the aspects of the design and content of the module that need to be improved to ensure that the module can be used at the best level. In terms of module design, the production of easy-to-understand sentence structures and interesting diagrams should be emphasized in module development. In terms of module content, a clearer objective setting is important, and appropriate training activities need to be produced to ensure module users can measure the extent of their understanding of all topics based on the set. Therefore, the findings of this study are expected to give insight into future studies to focus on important aspects in developing a module so that it can have better quality.

Acknowledgment

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