DEVELOPMENT AND EVALUATION OF NEW BADMINTON MODULE IN PHYSICAL EDUCATION

Nguang Ung Siong¹
Syed Kamaruzaman Bin Syed Ali ²

¹Faculty of Education, University of Malaya (UM), Malaysia, (ungsiong1@gmail.com)
²Faculty of Education, University of Malaya (UM), Malaysia, (syed@um.edu.my)

Abstract: The new module developed for Badminton must go through a thorough evaluation process to determine the module’s validity and reliability before it can be used by high school students in physical education classes. This research aimed to evaluate a new Badminton module that includes aspects of Badminton skills, motivation and self-confidence. 7 experienced physical education and Sport Science experts were appointed to conduct an assessment to determine the validity of the constructed module. After evaluating the validity of the module, a pilot study involving high school students was conducted to determine the reliability of the module. The module validity results obtained from the experts’ assessment in this research shows that the content validity score is high, while the module reliability obtained from the pilot study also showed a great overall Cronbach Alpha score. Thus, the high validity and reliability results of this research indicate that the constructed module is appropriate for high school students and also has a high level of consistency. When this new module is used in Badminton learning sessions in Physical Education classes, it has a great potential of achieving targeted learning objectives. Therefore, it is proposed to conduct an experimental study to assess the impact of this module on high school students in Malaysia.

Keywords: Training module, Validity, Reliability, Evaluation, Sidek module development model

Introduction

Modules are one of the reference materials that may be utilized to conduct learning sessions in a planned and systematic way (Mohd Noah & Ahmad, 2005). Modules are capable to provide a meaningful learning experience and they are designed to help students in mastering specific intended learning goals (Rusdinala et al., 2020). Thus, the modules should contain learning objectives, teaching aids and tests that can help all the students with different abilities to master well the topic of learning. Furthermore, the modules constructed should also be appropriate for the targeted group and are easy to be used in the learning sessions (Sarina, Kristiawan & Wardiah, 2019).

In high schools, although there is Badminton coaching module developed by the Ministry of Education Malaysia in 2010, but it is used to guide teachers who are the Badminton coaches in district level training centres that focus on Badminton coaching (KPM, 2010). Meanwhile, the
Badminton sports training module developed in 2011 is for the use of teachers who are appointed as Badminton sports club advisor teacher in high schools that focus on development of Badminton sport at school level (KPM, 2011). Therefore, the contents in the Badminton coaching module are more focused on fitness and Badminton game strategy (KPM, 2010) while the contents in Badminton sports training module for high schools’ club advisor teachers are more focused on rules and laws of the game of Badminton, competition system, tournament management and club management in high school (KPM, 2011).

This situation causes theories and instructional models in the teaching and learning of Badminton skills are not given focus and emphasis in the development of both Badminton modules that have been developed because the development goal of the modules is not for the use of Physical Education teachers to help them implement the teaching and learning of Badminton skills in Physical Education classes. The absence of comprehensive module developed for Badminton based on theories and instructional models to be used in the teaching and learning of Badminton skills results in the often use of traditional teacher-centred teaching by Physical Education teachers in high schools to train and teach students sport skills (Nguang, Ali & Hutkemri, 2020; Wee, 2016). Traditional teaching that provides comfort to Physical Education teachers is still their preferences in the implementation of teaching and learning sessions of Physical Education classes because the modules are not able to help in improving the teaching and learning practices of Physical Education teachers. This situation causes the achievement of learning outcomes of high school students in Badminton skills to be affected as they are found to have difficulties in mastering Badminton learning outcomes well through traditional teaching (Clarasasti & Jatmika, 2017; Nguang et al., 2020; Satriya & Jannah, 2017). Thus, students’ involvement in Badminton skills training sessions was affected when students lost initiatives to attend Badminton training during Physical Education class.

Therefore, there is a need to develop the new module as a guide for Physical Education teachers in high schools for the implementation of teaching and learning so that the high school students in Malaysia will able to master Badminton skills well. This is because the development of module as an intervention is important to overcome the problem of mastery of learning outcomes faced by high school students and continue to bring positive impacts in improving the learning outcomes achievement of targeted students in Physical Education class (Ali, Amat, & Mohd Kari, 2019; Mohd Noah & Ahmad, 2005). Furthermore, construction of new Badminton module is a necessity to overcome the issue of learning outcome achievement in Badminton skills for high school students in addition being able to develop Badminton skills learning sessions so that the learning outcomes achievement in the Physical Education class can be improved. Considering the importance of this module in helping to overcome students’ learning outcome achievement problems in Badminton skills, assessment on this module should be conducted in this study. It is hoped that the Badminton skills learning outcome issue of high school students affected by the frequent use of traditional teaching can be overcome and their learning outcome can be improved with the use of this comprehensive module by Physical Education teachers as a guide in the implementation of Badminton skills learning sessions in high schools in Malaysia. Therefore, the purpose of this study is to ensure that the module constructed has quality and is suitable for high school students through the assessment of the validity and reliability of the module content. To ensure that this module is suitable for high school students, this research is conducted to test the validity and reliability of this module.
Research Objectives
In line with the aim of the study, the research objectives outlined are to investigate the experts’ evaluation and the reliability value of the new Badminton module's whole content as well as the topics covered in the module's learning units.

Literature Review

Development and Evaluation of Modules in Physical Education and Sports
In a study on the development and evaluation of the Physical Training Algorithm Module for the improvement of physical fitness knowledge and skills of first year students at the university in the Physical Education curriculum was conducted by Safonova, Kadyrov and Dementiev (2019). The Physical Training Algorithm Module includes endurance training, speed training, strength training, and coordination training. The study showed that the use of the Physical Training Algorithm Module brings benefits to the development of students' physical fitness knowledge and effective in improving their skill related physical fitness to help the students to stay fit in various physical aspects. Meanwhile, a study by Maksimova, Daini and Yevseyeva (2019) has developed an ethnic sports training module for students in rural schools in Russia. The ethnic sports training module based on Evenk traditional games and sports which includes ethnic games, skating, national dance, national wrestling, archery, cross-country racing and some other ethnic sports and relevant knowledge in the module. After that, the evaluation of the ethnic sports training module was carried out for the students aged 11 till 13 years old in Russia. The evaluation of the module found that the ethnic sports training module benefited the students in rural schools with efficiency improvements in fitness and physical activity through more meaningful learning in Physical Education course.

In Malaysia, a study by Khalid, Rasyid and Razak (2019) has developed a module that integrates mindfulness, acceptance and commitment for the use of aerobic training for university students. In addition, the evaluation was also carried out for the first semester Sultan Idris Education University students in the Coaching Science programme. The results found that the module is suitable to be used to improve aerobic endurance performance in training for university students. Furthermore, a study conducted by Kubiyeva et al. (2020) also developed and evaluated a module in the form of electronic textbooks which contains goals, objectives, tasks and test that need to be implemented in the module with electronic learning tools. After the module was developed, the evaluation of the electronic module was carried out for the students of Aktobe Regional State University in Russia. The results of the study found that the use of the module successfully improved physical fitness of the university students in Physical Education class. For primary school students, a study by Bakulina, Mikhaylova and Rysakova (2021) has developed and evaluated the WorldSkills module for the use of physical development of year two students. The development of the WorldSkills module involves search game activities to improve the fitness of primary school students. Through the module evaluation in this study, it found that the WorldSkills module is effective to improve the physical fitness of the students after being handled prudently in accordance with the age and standard of physical fitness of the year two students. Thus, this module was found to be beneficial to the primary students with the improvement of strength, power, flexibility, speed and movement coordination in which will enhance their physical fitness in Physical Education class. Literature review has shown that studies on the development and evaluation of training modules in Physical Education and sport for students in secondary schools are still limited either abroad or in Malaysia, especially on the aspect of achievement, motivation and self-confidence in Badminton. Therefore, there is a need to carry out a study to develop and evaluate the
Badminton module on achievement, motivation and self-confidence among form one students in learning Badminton skills to fill the gap through this study.

**Theoretical Framework For The Development of New Module**
The three primary theories on which the module was developed are social interdependence theory (Johnson & Johnson, 1989), Skinner’s operant conditioning theory (Skinner, 1953) and Thorndike’s theory (Thorndike, 1932). Meanwhile, this module was also constructed based on STAD cooperative learning instructional model (Metzler, 2011). Therefore, the integration of theories along with the instructional model has become the solid foundation and guide in constructing the comprehensive Badminton module that is appropriate to the ability and development of the high school students in form one. The learning processes in the module developed can provide new learning experiences through teaching and facilitation activities to encourage the improvement of Badminton skills learning outcome in Physical Education classes.

**Module Development Procedure Using The Sidek Module Development Model**
Sidek Module Development Model is a development model introduced by Sidek Mohd Noah from Malaysia (Mohd Noah & Ahmad, 2005). Sidek Module Development Model is an appropriate model in module development because the process for developing a quality module must be based on suitable module development model (Ali, Amat & Mohd Kari, 2019; Mahmud, Mohd Noah, Ahmad & Ahmad, 2016; Mohd Noah & Ahmad, 2005). Sidek Model used in this study is a more comprehensive module development model and is suitable to be used as reference to develop module in various field based on cultural norms in Malaysia (Ali, Amat & Mohd Kari, 2019; Osman, 2017; Mat Rasik & Ismail, 2019). Furthermore, the module development model also has systematic and structured steps in the development of quality modules through a clear and thorough guide of module development steps (Mohd Noah & Ahmad, 2005; Idris & Shaari, 2017; Saper, Mohd Daud & Ahmad, 2016). Therefore, the Sidek Module Development Model is selected by the researcher and used as a guide in the process of developing the new module for Badminton and also to evaluate the validity and determine the reliability of the module. This can ensure the quality of the Badminton module is maintained and is suitable for students in high schools in Malaysia through a systematic module development process and more thorough development steps in module development. By following all the procedures set while constructing the module, the researcher is confident that this module is able to provide optimal impact to high school students aged 13 to 14 years to improve learning outcomes during teaching and learning sessions of Badminton skills in Physical Education classes.

There are two preparation phases of developing the new module, which include producing a module draft and followed by testing and evaluating the module based on guidelines to Sidek Module Development Model (Izwan Mahmud et al., 2016; Mohd Noah & Ahmad, 2005). The first phase is to construct a module draft which consists of nine steps as proposed by the Sidek Model. The development process of module begins with goal setting, identifying theory, rationale, philosophy, concept, target and timeline, research needs, setting objectives, content selection, strategy selection, logistics selection, media selection and module draft consolidation. The Badminton module draft has applied the integration of social interdependence theory, Skinner’s operant conditioning theory and Thorndike’s theory along with STAD cooperative learning instructional model that emphasizes collaboration in small groups, mutual assistance in learning sessions to support Badminton skills learning to meet the needs of students with different abilities so that they are better prepared in Badminton skills learning activities to
improve learning outcomes of students in terms of skill achievement, motivation and self-confidence. The new Badminton module's draft content generally comprises of three learning units and six learning sessions for the Badminton skills of high serve, low backhand serve and lob shots. Thus, each Badminton skills learning unit consists of two learning topics for each type of Badminton skills starting with the topic of high serve skills to Badminton lob shots skills. The second phase in the Sidek Module Development Model is testing and evaluating the module draft. In testing and evaluating the Badminton module at the second stage, the constructed module went through a pilot study and followed by process of determining its validity and reliability. If high validity and reliability obtained, this module can be implemented in an actual study to evaluate the effectiveness of the module.

**Method**

A survey study is used in this study to test the validity and reliability of the draft of new module constructed. In content validity, at least 2 experts (Chai, Siew & Lee, 2021), three experts (Rahim & Lee, 2021) or 6 experts (Ali, Amat & Mohd Kari, 2019; Nawi et al., 2015) should be referred to measure the content validity of the module developed. Thus, the content validity of the module constructed is evaluated by 7 panels expert in the fields of Physical Education and Sports Science from universities, Institute of Teacher Education and high schools by filling out module expert validity questionnaires distributed to experts in the evaluation process. They are from different background such as Professor, Associate Professor from universities, senior lecture of physical education (with Doctor of Philosophy degree holder), head of physical education department, and excellent lecturer of physical education from Institute of Teacher Education Malaysia. Furthermore, an excellent teacher of physical education from government high school also appointed as one of the expert panels to evaluate the validity of the constructed module.

The content validity of the Badminton module is examined in this study through feedback and evaluation by expert panels to assure the quality of the module and effective execution of the module (Mohd Noah & Ahmad, 2005; Ali, Amat & Mohd Kari, 2019). The expert panel must assess and verify the module's overall content as advised by Mohd Noah and Ahmad (2005), the content validity of the module units as recommended by Mohamed Arip (2010) and subsequently obtain expert views and comments in content validation form. Thus, this study's content validity questionnaire form was adapted from versions by Mohd Noah and Ahmad (2005) and Mohamed Arip (2010). Later, the researcher gained approved from 7 expert panels to evaluate and measure content validity of the module. This module can be considered as a good, quality, complete and suitable module for the target group if the content validity of the module is above 0.70 (Nawi et al., 2015; Rahim & Lee, 2021; Ali, Amat & Mohd Kari, 2019). The achievement level of module content validity is set at 70 percent and above so that this new module can be verified having high content validity (Tuckman & Waheed, 1981; Tuckman, 1988; Zahir et al., 2019). Furthermore, expert panels are also requested to provide views and comments as well as suggestions and improvements in the spaces provided in the questionnaires. Views and comments as well as suggestions and improvements from experts were used by the researcher for improvement of the module. After the module was improved and refined, a pilot study to measure the module reliability was conducted on the target group consisting of high school students.

A pilot study should be done to assess the new module's reliability value after expert review of the content validity (Mat Rasik & Ismail, 2019; Idris & Shaari, 2017). This pilot study is crucial to make sure that the module draft’s reliability value is acceptable and appropriate for high
school students, and it will also utilise by the researcher to refine the module draft before conducting the study on the actual subject. To determine the overall reliability value of the module and the learning units of the module by using Cronbach’s Alpha method, the construction of the statements in the questionnaire can be done based on the objectives of the module (Ali, Amat & Mohd Kari, 2019; Mohamed Arip, 2010, Mohd Noah & Ahmad, 2005). Thus, based on the objectives of the learning units in the module that have been assessed and approved by the experts in the module validation process, the statements in the reliability questionnaire for this study were constructed. The questionnaire in which comprises of 18 statements based on six learning topics in the Module’s learning units, is used to assess the reliability of this module. In order to assess the module's reliability, a pilot study involving thirty-one high school students (ages 13 to 14) was conducted in a high school in the Kuching region. The selection of the respondents is suitable according to the needs of the pilot study because it has characteristics that are similar to the actual study subject and the number of participants is suitable to assist the researcher to obtain the overall reliability value of the module and the learning units in the Badminton module required by using Cronbach’s Alpha method (Ali, Amat & Mohd Kari, 2019; Nawi et al., 2015; Saper, Mohd Daud & Ahmad, 2016; Zahir et al., 2019). They went through all the activities in the module and answered all the module reliability items in the questionnaire assessing the module reliability when completing all the activities in the module.

All high school students who attended the learning sessions in this study also answered the questionnaire to assess the reliability of the module after completing the pilot study. In terms of reliability value, at least a minimum reliability value of 0.60 should be achieved to indicate that the module has a good, acceptable and consistent level of reliability (Ali, Amat & Mohd Kari, 2019; Pallant, 2013; Sekaran & Bougie, 2016). Thus, Cronbach’s Alpha value of 0.6 and above should be achieved in determining the reliability for each topic in the module. However, module reliability value that reaches 0.70 and above or nearer to Cronbach’s Alpha by 1.0 are better (Fraenkel, Wallen & Hyun, 2012; Kerlinger, 1986; Mohd Noah & Ahmad, 2005; Idris & Shaari 2017; Nawi et al., 2015). After the respondents answered the module reliability questionnaire, Cronbach’s Alpha values were analysed using SPSS version 22 software. Official approval from the Planning and Research Division, Sarawak State Education Department, Kuching District Education Office and school administrators was obtained prior to the implementation of a pilot study on the targeted population group for assessing the module’s reliability.

Results

The Experts’ Evaluation of the New Module
The findings of the content validity of this module involved 7 panel of experts who were appointed to assess the module's validity as a whole and the learning units based on the content validity questionnaire distributed. The selected experts are academics with expertise in the fields of Physical Education and Sports Science with more than 7 years of experience in their respective fields and also comprised of different backgrounds. The appointed panel of experts serve in universities, Institutes of Teacher Education of Malaysia and also in high schools. The results of the expert validity assessment for the overall content of the module are as shown in Table 1. Table 1 shows that the overall content validity value of the module is 91.8% or 0.918 based on the experts’ feedback on the items in the content validity questionnaire. The content validity for the statements in Table 1 ranges from 90% to 94.3%. Therefore, 90% or higher achievement rate for content statements in Badminton module indicates that this module meets
its target population, can be implemented perfectly, is appropriate to the time allocated, can improve the performance of Badminton skills achievement, can increase self-confidence level in the implementation of Badminton skills. Meanwhile, module's content can increase the motivation level during the learning of Badminton skills as well. Overall content validity is good as it has reached 0.7 or above. Thus, the new Badminton module is a module that meets the target population, can be implemented perfectly, is appropriate to the time allocated and achieve the objectives set in the module.

Table 1: Overall Assessment Of Module Content Validity For The New Module

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Percentage (%)</th>
<th>Expert Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The content of this module meets its target population.</td>
<td>90.0</td>
<td>Accepted</td>
</tr>
<tr>
<td>2.</td>
<td>The content of this module can be implemented perfectly.</td>
<td>90.0</td>
<td>Accepted</td>
</tr>
<tr>
<td>3.</td>
<td>The content of this module is appropriate to the time allocated.</td>
<td>92.8</td>
<td>Accepted</td>
</tr>
<tr>
<td>4.</td>
<td>The content of this module can improve the performance of Badminton skills achievement.</td>
<td>91.4</td>
<td>Accepted</td>
</tr>
<tr>
<td>5.</td>
<td>The content of this module can increase the motivation level during the learning of Badminton skills.</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>6.</td>
<td>The content of this module can increase self-confidence level in the implementation of Badminton skills.</td>
<td>92.8</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Total score obtain from expert x 100% = 91.8 Acceptance

Overall content validity Value = 0.918 Acceptance

Findings of expert validity based on learning units are shown in Table 2. From Table 2, the results of expert validity for all the topics in the learning units of the module are higher than 70% for all the topics in the learning units in which achieved 94.3% based on the expert validity. As a result, the overall score value of the learning units in the module is high as shown in Table 2. Thus, the level of validity of the new module is good as it exceeds 0.7 through expert assessment based on the learning units. Experts also provide written reviews and suggestions for researchers to make improvements on the content or learning units of the new module. The addition of photographs to highlight each skill and the diversification of the warm-up exercises by incorporating rhythmic and imaginative group motions, adding pictures of Badminton skills implementation steps (as an additional guide) to teachers’ descriptions and adding follow through pictures as well as implementation photos of each activity are enhancements proposed by experts. In addition, experts also commented that diagrams and photos should be added for clearer and better understanding, quantity of teaching aids used should be stated and to include diagrams to show class organisation in the learning sessions. Researcher has made improvements based on reviews, recommendations and evaluations by expert panels in each topic in the learning units of the module.
Table 2: Assessment For Topics In The Learning Unit Of The New Module

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>Percentage (%)</th>
<th>Expert Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badminton High Serve</td>
<td>Topic 1: Let’s Play High Serve</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Skill</td>
<td>Topic 2: Let’s Serve High and Far</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Badminton Low Backhand</td>
<td>Topic 3: Let’s Learn Low Serve</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Serve Skill</td>
<td>Topic 4: Let’s Play Over-the-Net Serve</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Badminton Low Backhand</td>
<td>Topic 5: Let’s Play Shots</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Serve Skill</td>
<td>Topic 6: Let’s Hit Far and High</td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Overall Average Score</td>
<td></td>
<td>94.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>Overall Score Value</td>
<td></td>
<td>0.943</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

The Reliability value of the New Module

Table 3: Module Reliability For Topics In The Learning Unit Of The New Module

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>α Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badminton High Serve</td>
<td>Topic 1: Let’s Play High Serve</td>
<td>0.72</td>
</tr>
<tr>
<td>Skill</td>
<td>Topic 2: Let’s Serve High and Far</td>
<td>0.71</td>
</tr>
<tr>
<td>Badminton Low Backhand</td>
<td>Topic 3: Let’s Learn Low Serve</td>
<td>0.80</td>
</tr>
<tr>
<td>Serve Skill</td>
<td>Topic 4: Let’s Play Over-the-Net Serve</td>
<td>0.72</td>
</tr>
<tr>
<td>Badminton Low Backhand</td>
<td>Topic 5: Let’s Play Shots</td>
<td>0.73</td>
</tr>
<tr>
<td>Serve Skill</td>
<td>Topic 6: Let’s Hit Far and High</td>
<td>0.79</td>
</tr>
<tr>
<td>Overall α Value</td>
<td></td>
<td>0.96</td>
</tr>
</tbody>
</table>

Based on the topics in the learning unit of the new module conducted on high school students, the overall Cronbach’s alpha (α) reliability of the six module learning topics is 0.96. This result reveals that the module's overall reliability is high. The overall reliability value of the module and the learning topics in the learning unit of the module are shown in the Table 3. Table 3 shows reliability values of six learning topics in the module. The highest Cronbach’s alpha value is 0.80 for Topic 3 Let’s Learn Low Serve. Meanwhile, the lowest Cronbach’s alpha is 0.71, which is Topic 2 Let’s Serve High and Far. The overall Cronbach’s alpha reliability for the module is 0.96. This indicates that the reliability value of the module is high, acceptable and reliable for the targeted group. Meanwhile, the Cronbach’s alpha reliability value for each topic in the learning unit ranges from 0.71 to 0.80 while the overall module reliability value is 0.96 as shown in Table 3. Thus, the reliability value of the module is greater than the value of 0.70. This result indicates that the module has a good and acceptable consistency value (Fraenkel, Wallen & Hyun, 2012).
Discussion
The high content validity of the new Badminton module from experts’ assessment and the feedback as well as comments given by experts show that the content and activities in each unit and topic are in line with the learning outcome of the module. Thus, the main objective of the Module which aims to improve the learning outcomes of Badminton skills can be achieved based on the integration of social interdependence theory, Skinner’s operant conditioning theory, and Thorndike’s theory with the STAD cooperative teaching and learning model in the process of module construction through the Sidek Module Development Model. Good reliability of the module has also shown that high school students can achieve the objectives of the module and follow every learning activity implemented in this module successfully. The reliability values obtained in the pilot study have indicated that the content of this module is reliable and suitable to be used in experimental studies. Furthermore, the smooth application of the module on the target population (high school students) in following each activity during the pilot study shown that the module developed is of high quality and suitable for use in improving Badminton learning outcomes. Thus, high school students who follow the Badminton skills learning activities in the module constructed can provide a positive impact to improve the learning outcomes of Badminton skills. The results obtained have shown that the construction of the new module in this study is in line with the module development process based on the Sidek Module Development Model (Saper, Mohd Daud & Ahmad, 2016; Mat Rasik & Ismail, 2019; Mohd Noah & Ahmad, 2005). The development of this Badminton module can be considered as a quality and complete module after going through a process of expert content validation and pilot study to assess the module reliability (Ali, Amat & Mohd Kari, 2019; Zahir, et al., 2019; Mohd Noah & Ahmad, 2005).

After going through a process of expert content validation and pilot study to verify module reliability, this Badminton module can be considered as a quality and comprehensive module. Overall, the researcher was able to obtain high content validity and reliability results from the module by following all of the systematic steps in the module construction process by using a more comprehensive Sidek Module Development Model. This is because the module construction process implemented by the researcher is parallel to the process proposed by the Sidek Module Development Model (Mohd Noah & Ahmad, 2005). Furthermore, the integration of social interdependence theory (Johnson & Johnson, 1989), Skinner’s operant conditioning theory (Skinner, 1953) and Thorndike’s theory (Thorndike, 1932) together with the STAD cooperative teaching and learning model (Metzler, 2011) also played an important role and contributed to the construction of new Badminton module that meets the level of form one high school students. Based on the content validity and reliability results of module achieved in this study, the integration of theory along with the teaching model has proven that this module is capable of providing meaningful learning experiences to students.

Conclusion
The findings of this study has proved that the new module has good validity and achieves the objectives of the module through assessments, comments, and suggestions from the content validity of the module with improvements recommended by experts. The suggestions and feedbacks provided have contributed to the development of a good and quality module. Assessments and reviews of objectives as well as learning activities in the module have reflected that each topic in the learning unit is appropriate to the target group. Good credibility of the module in the pilot study has also shown that high school students can effectively complete the module's objectives and every learning activity incorporated in this module. Therefore, this module's content is credible and appropriate for use in improving the learning
outcomes of Badminton skills. In order to extend the use of this new module to students in high schools, training sessions should be given to Physical Education teachers to help them understand and use this module accurately and effectively. The findings of this study also suggest to conduct an experimental study to assess the impact of this module on high school students aged between 13 and 14 years in Malaysia. The use of this new module is expected to provide knowledge to Physical Education teachers in dealing with problems and further improve the learning outcomes of Badminton skills of students in high schools in an integrated and effective manner.

References


