Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

EMPOWERING YOUNG MINDS: VALIDATING THE I-DECOBEST MODULE TO BOOST ENERGY LITERACY, SCIENCE SKILLS, AND ATTITUDE FOR ELECTRICITY IN STANDARD 5

Mohd Yahya Fadzli Jusoh [1]
Nor Asniza Ishak [2]
Rendi Restiana Sukardi [3]
Muhd Zulhilmi Haron [4]

[1] Perai Industrial Training Institute, Lorong Perusahaan Satu, Kawasan Perusahaan Perai, 13600 Perai, Pulau Pinang (Email: fadmy29@gmail.com)
[2] School of Educational Studies, Universiti Sains Malaysia, 11800 USM, Pulau Pinang Centre for Institutional & Strategic Planning, Universiti Sains Malaysia Building C03, 11800 USM Penang
(Email: asnizaishak@usm.my)
*Correspondence
[3] Cibiru Campus of Universitas Pendidikan Indonesia, Cibiru Wetan, Bandung, West Java, Indonesia
(Email: rendisukardi@upi.edu)
[4] College of Arts and Sciences, Universiti Utara Malaysia, 06010 UUM Sintok Kedah Darul Aman, Malaysia
(Email: muhd.zulhilmi@uum.edu.my

Article history
Received date : 3-5-2025
Revised date : 4-5-2025
Accepted date : 28-6-2025
Published date : 14-7-2025

To cite this document:
Jusoh, M. Y. F., Ishak, N. A., Sukardi, R. R., & Haron. M. Z. (2025). Empowering young minds: Validating the I-DECOBEST module to boost energy literacy, science skills, and attitude for electricity in Standard 5. *Journal of Islamic, Social, Economics and Development (JISED),* 10 (73), 703 - 716.

Abstract: *This study evaluates the content validity of the I-DECOBEST module, aimed at enhancing energy literacy, science process skills, and attitudes towards electricity among primary school students. A panel of 7 subject matter experts from various academic fields assessed the module's content using a 10-point Likert scale. Experts evaluated five items related to the module's relevance, feasibility, and potential to meet its educational objectives. The overall content validity score was calculated by dividing the total expert scores by the maximum possible score. The module achieved a content validity score of 88.86%, which is above the accepted threshold of 70%, indicating strong content validity. These findings suggest that the I-DECOBEST module is a well-designed educational tool that aligns with its intended outcomes and is suitable for enhancing energy literacy and science-related competencies in primary education.*

Keywords: *content validity, I-DECOBEST module, energy literacy, science process skills, primary science education*

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Introduction

Introducing the concept of electricity to upper primary school pupils, particularly those in Standard five, poses a considerable educational challenge (Fujikawa et al., 2020). During this phase of cognitive growth, learners progress from concrete operational thinking towards more abstract reasoning. Consequently, it is crucial to present intricate scientific notions such as electricity through meticulously designed educational approaches. In the absence of such well-structured learning modules, pupils often find it difficult to comprehend the basic principles of electricity. This struggle has been demonstrated to adversely affect their acquisition of science process skills, understanding of energy concepts, and their overall enthusiasm for science education. (Sissamperi & Koliopoulos, 2021). The lack of focused interventions and exploratory learning approaches in teaching electricity has resulted in noticeable gaps in students' fundamental comprehension, analytical reasoning, and issue-resolution capabilities. These skills are essential for advancing in scientific studies. (Cunningham & Carlsen, 2021). Moreover, studies have consistently shown that poor teaching methods can result in inadequate energy literacy and a lack of interest in scientific subjects. This is particularly worrying in an age where knowledge of sustainable energy practices and technological proficiency are becoming increasingly crucial (Morais & Miranda, 2019).

The *Kurikulum Standard Sekolah Rendah* (KSSR) for Science in Standard 5 focuses on developing skills in safe electrical equipment handling, understanding complete electrical circuits, and identifying various electrical energy sources. To meet these educational requirements, it is essential to develop a thorough teaching module that aligns with these specified competencies (Ng & Adnan, 2018). The syllabus highlights essential competencies that should be incorporated into the educational programme. These include brainstorming about safety measures for electrical devices, assembling fully functional electrical circuits, and recognising various sources of electrical power. The I-DECOBEST module has been designed to meet these needs by incorporating Integrated learning, Design Thinking, COBE (Cognitive Behavioural Therapy), and ST (*Energy Sustainability Practices*). This methodology guarantees that the module not only tackles the cognitive and behavioural elements of learning but also corresponds with the national curriculum's emphasis on energy literacy and scientific process abilities. Consequently, the main aim of this research is to validate the content of the I-DECOBEST module. The validation procedure will evaluate whether the module efficiently addresses the crucial learning goals outlined in the KSSR for electricity, whilst enhancing pupils' scientific process skills, energy literacy, and disposition towards learning about electricity.

Literature Review

The primary school science curriculum incorporates electricity as a fundamental yet challenging topic. In Malaysia, the KSSR establishes precise learning objectives for upper primary students, concentrating on the comprehension of energy sources, electrical circuit construction, and safety measure implementation. Nonetheless, many pupils find it difficult to grasp these abstract ideas, despite the well-defined curriculum. Research extensively demonstrates that without innovative pedagogical strategies, students exhibit poor engagement and underperform in developing both scientific process competencies and energy literacy.

Challenges in Electricity Education

Studies indicate that students face difficulties in grasping electricity-related concepts without innovative teaching approaches. Conventional teaching methods often prove inadequate in addressing the intricacies of electricity, resulting in students developing superficial understanding (Gita et al., 2023). A widely recognised problem in primary education is the challenge of linking theoretical knowledge to practical applications. This issue is further compounded by subpar learning resources and memorisation-based teaching, which limit students' opportunities to investigate, conduct experiments, and apply critical thinking to real-world scenarios (Sissamperi & Koliopoulos, 2021).

Science Process Skills and Energy Literacy

The cognitive tools employed by students to explore, examine, and comprehend scientific phenomena are known as science process skills. These abilities play a vital role in fostering scientific literacy and developing critical thinking capabilities (Schleser et al., 2023). Conversely, energy literacy involves comprehension of energy-related concepts and sustainable practices. However, research has shown that the majority of primary school pupils demonstrate poor energy literacy levels, attributed to ineffective teaching strategies that fail to emphasise interactive or inquiry-based learning approaches (Mustadi et al., 2023). Considering the increasing significance of energy sustainability, it is becoming ever more essential to improve students' energy literacy.

Interactive and Inquiry-Based Learning Approaches

Research has demonstrated the efficacy of interactive, inquiry-based learning modules in addressing these obstacles. Leontini et al. (2023) suggest that a transition to practical, experiential learning enables students to interact directly with electrical principles, thus enhancing their comprehension and enthusiasm. Moreover, the integration of inquiry-based teaching methods with Design Thinking and Cognitive Behavioural Therapy (CBT) has been found to enhance both cognitive and behavioural outcomes amongst students (Morais & Miranda, 2019). Sissamperi & Koliopoulos (2021) emphasise the crucial role of inquiry in energy systems education, demonstrating that learners who actively investigate the structure and operation of circuits are significantly more adept at retaining and implementing their knowledge.

I-DECOBEST Module

The I-DECOBEST module has been developed to incorporate a range of evidence-based methodologies. This all-encompassing module, formulated as an acronym, combines Integrated Learning, Design Thinking, COBE (Cognitive Behavioural Therapy), and Sustainability Energy Practices (Amalan Kelestarian Tenaga). Through the inclusion of inquiry-based, interactive activities, the module enables students to engage in hands-on experiments and problem-solving exercises that are in line with KSSR goals. This combination of cognitive and behavioural approaches is anticipated to significantly enhance pupils' science process skills and energy consciousness, addressing both the cognitive and affective dimensions of learning.

Why I-DECOBEST Module Validation is Critical?

The I-DECOBEST module, designed to tackle recognised difficulties in electricity education, requires thorough validation to ensure its pedagogical soundness, alignment with educational benchmarks, and achievement of intended learning outcomes. Dunn & Leeson (2020) assert that educational tools must undergo validation to verify their efficacy in actual classroom environments, guaranteeing that the devised interventions genuinely address pupils' needs. Moreover, Schleser et al. (2023) contend that without proper validation, educational innovations risk implementation without empirical backing, potentially leading to inconsistent learning outcomes.

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Validating the I-DECOBEST module will ascertain whether its inquiry-based, interactive approaches genuinely improve students' comprehension of electricity concepts, as predicted by the research. Mustadi et al. (2023) emphasise that failing to validate educational modules can result in a mismatch between the planned curriculum and students' actual performance, leading to ineffective teaching and exacerbating gaps in scientific literacy. Furthermore, validation ensures the module's adaptability to various learning environments and its capacity to meet diverse student needs across different educational contexts.

In conclusion, validating the I-DECOBEST module is crucial to confirm its ability to enhance science process skills, energy literacy, and students' overall attitudes towards learning electricity. Only through validation can educators be assured of the module's capacity to produce quantifiable, positive outcomes in the classroom, thereby contributing to enhanced science education practices at the primary level.

Table 1: Literature Review Matrix

Study	Focus	Key Findings	Relevance to I-DECOBEST Module
Gita et al. (2023)	Science literacy and electrical material	Moderate science literacy: practical activities improve learning	Highlights the importance of practical, hands-on learning in the module
Sissamperi & Koliopoulos (2021)	Teaching energy systems in primary school	Inquiry-based methods improve student understanding of energy	Supports inquiry-based learning in I-DECOBEST module
Mustadi et al. (2023)	Energy literacy and science process skills	Primary students exhibit low energy literacy due to passive teaching	Validates the need for enhancing energy literacy in the module
Schleser et al. (2023)	Energy literacies and community engagement	Hands-on learning and community engagement improve understanding	Supports community-based, experiential learning approaches
Leontini et al. (2023)	Mobile storytelling and energy literacy	Mobile storytelling improves engagement and literacy in energy	Suggests the incorporation of creative, multimedia approaches in I-DECOBEST

Therefore, based on the literature, validation of the IDECOBEST module is not merely an academic exercise but a crucial step in ensuring its effectiveness. Dunn & Leeson (2020) emphasize that educational modules require content and pedagogical validation to ensure their success in the classroom. A validated module not only proves its alignment with national curriculum standards like the KSSR, but also confirms its ability to foster essential skills such as critical thinking, problem-solving, and energy literacy among students. Failure to validate can lead to ineffective educational interventions, which perpetuate the very gaps the I-DECOBEST module seeks to address. Therefore, the validation process is an indispensable aspect of ensuring that the I-DECOBEST module fulfils its goals in enhancing science education for upper primary school students.

Methods

The I-DECOBEST module development process incorporates a crucial expert validation stage to ensure the module's adherence to both pedagogical and content standards prior to classroom

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

implementation. This stage follows the procedural flow outlined in Muhammad Saiful Bahari's (2019) adaptation procedure. In contrast, the method for crafting the validation form is based on Sidek Noah and Jamaluddin's (2005) approach, which offers a systematic framework for expert-led educational module validation. The main aim of this validation is to evaluate the module's pertinence, instructional efficacy, and compatibility with the KSSR. Additionally, it assesses the module's capacity to improve pupils' grasp of electricity concepts, energy literacy, and science process skills. The procedure encompasses six distinct steps, which are elaborated as follows:

Step 1: Preparing the Content Validation Form

In line with Sidek Noah and Jamaluddin (2005), adapted from Russell (1974), the content validation form is designed to systematically gather expert feedback on the I-DECOBEST module. The form combines quantitative ratings and qualitative feedback, enabling a thorough assessment of the module's relevance, clarity, and instructional effectiveness. Table simplify the essence of the form of validation:

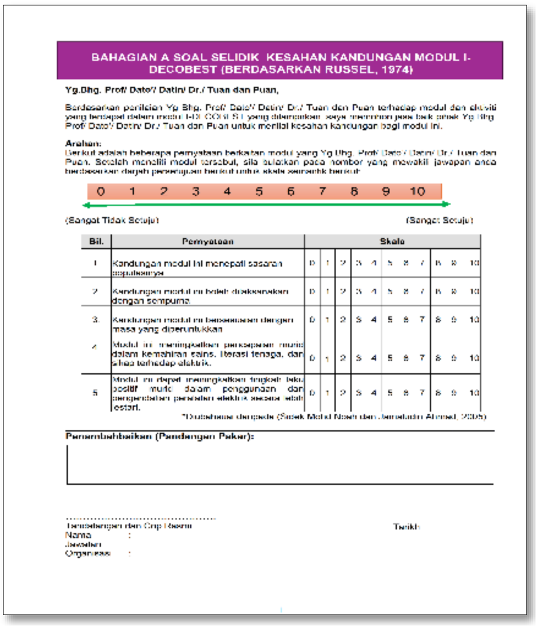
Table 2: Items in validation form

No.	Explanation
1	Introduction: A brief explanation of the validation process, outlining the importance of expert feedback in refining the module.
2	Instructions: Clear guidance on how to complete the form, typically using a 1-10 scale for rating the module's aspects.
3	Evaluation Statements: Statements addressing key areas such as content alignment with the target audience (Standard 5), time appropriateness, and the development of science process skills and energy literacy.
4	Scoring System: Experts rate each statement on a 1 to 10 semantic scale, providing a nuanced quantitative measure of the module's quality.
5	Qualitative Feedback: Space for experts to provide detailed suggestions or highlight specific strengths and weaknesses.
6	Expert Details: Fields for name, title, organization, signature, and date to validate participation.

This structured approach ensures that the I-DECOBEST module is evaluated comprehensively and objectively, allowing for targeted improvements based on expert input. Thus, by referring to the criterion that explained in Table, it is impose this design of the form represented in Figure 1:

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Figure 1: Format for Validation Form



BAHAGIAN A SOAL SELIDIK KESAHAN KANDUNGAN MODUL I-DECOBEST (BERDASARKAN RUSSEL, 1974)

Yg.Bhg. Prof/ Dato'/ Datin/ Dr./ Tuan dan Puan,

Berdasarkan penilaian Yg Bhg. Prof/ Dato'/ Datin/ Dr./ Tuan dan Puan terhadap modul dan aktiviti [illegible] Prof/ Dato'/ Datin/ Dr./ Tuan dan Puan untuk menilai kesahan kandungan bagi modul ini.

Arahan:
[illegible] Puan. Setelah meneliti modul tersebut, sila bulatkan pada nombor yang mewakili jawapan anda [illegible]

0 1 2 3 4 5 6 7 8 9 10

(Sangat Tidak Setuju) (Sangat Setuju)

Bil.	Pernyataan	Skala
1	Kandungan modul ini menepati sasaran [illegible]	0 1 2 3 4 5 6 7 8 9 10
2	[illegible] dengan sempurna	0 1 2 3 4 5 6 7 8 9 10
3.	[illegible] masa yang diperuntukkan	0 1 2 3 4 5 6 7 8 9 10
4	Modul ini meningkatkan [illegible] dalam kemahiran sains, literasi tenaga, dan sikap terhadap elektrik.	0 1 2 3 4 5 6 7 8 9 10
5	Modul ini dapat meningkatkan tingkah laku positif murid dalam penggunaan dan [illegible] lestari.	0 1 2 3 4 5 6 7 8 9 10

*Diubahsuai daripada (Sidek Mohd Noah dan Jamaludin Ahmad, 2005)

Penambahbaikan (Pandangan Pakar):

....
Tandatangan dan Cop Rasmi
Nama :
Jawatan
Organisasi :

Tarikh

Step
2: Selecting the Expert Panel
Expert validation is essential in educational module development to ensure content accuracy, pedagogical alignment, and instructional effectiveness. Recent studies, such as Noroozi et al. (2021), Hashim et al. (2019), and Van Driel et al. (2020), highlight the role of experts in refining modules through iterative feedback. These validations improve modules by aligning them with curriculum standards, enhancing their practical applicability, and ensuring they meet educational objectives effectively. In this research, 7 experts has been selected which comes from various background that related with education, subject matter and psychology. These experts should come from a variety of relevant fields to ensure that the module is scientifically accurate, pedagogically sound, and appropriate for young learners.

Experts may include educational psychologists who understand how children learn and process information at this stage (Brown, 2020), curriculum developers who ensure the content aligns with educational standards (Tomlinson, 2018), and subject-matter experts in electricity to ensure the scientific content is accurate but simplified for young minds (Davies et al., 2019). Including teachers who have practical experience in the classroom is crucial, as they provide feedback on how well the module works in real-world teaching scenarios (Sawyer & van de Ven, 2021). The combined insights from these experts help create a module that is engaging, easy to understand, and meets educational objectives (Zahra et al., 2020). This diverse expertise ensures that all aspects of the module are thoroughly examined, leading to an educational resource that is both effective and practical for primary school students.

Step 3: Conducting the Validation
The IDECOBEST module validation employs a flexible approach by integrating face-to-face meetings, email communication, and the use of an online platform to ensure that experts can provide comprehensive feedback. Following Sidek Noah and Jamaluddin (2005) framework, these methods allow experts to review the module independently while maintaining open channels of communication for clarification and further input. Face-to-face meetings provide

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

an opportunity for real-time discussion, allowing experts to ask questions directly and offer immediate feedback, promoting a richer exchange of ideas. This method helps ensure that the experts fully understand the module's content and objectives, as recommended by Graham et al. (2020).

In addition to face-to-face interactions, experts are provided with module materials and the validation form via email to allow them to review the content at their convenience. Experts typically have two to three weeks to complete their evaluations, ensuring they have enough time to offer thoughtful and thorough feedback without being rushed. This approach, supported by Polit and Beck (2021), ensures flexibility and gives experts the freedom to work according to their schedules. The email method also facilitates follow-up communication, enabling the validation coordinator to send reminders and address any questions experts may have.

An online platform, such as Google Drive or Dropbox, is also utilized to provide easy access to the module materials and validation forms. Experts can access the documents, submit their feedback, and engage with the materials from any location. This method, as suggested by Jones et al. (2019), ensures accessibility and convenience, especially for experts who are remotely located or prefer a digital workspace. Combining these methods creates a comprehensive and flexible validation process, allowing the I-DECOBEST module to be reviewed rigorously while accommodating the different needs and preferences of the experts involved.

Step 4: Data Collection and Analysis
Once the expert panel has completed the content validation, the next step involves gathering and analysing both the quantitative ratings and qualitative feedback. This is done to determine the content validity of the I-DECOBEST module. Using Sidek Noah and Jamaluddin (2005) as a guide, the process focuses on calculating the Content Validity Percentage (CVP) to quantitatively measure the relevance of the module. All validation forms are gathered (whether through face-to-face, email, or an online platform) to ensure that both the Likert scale ratings and qualitative comments are recorded. For this analysis, we assume 13 experts, each rating 5 items on a 1-10 semantic scale. Quantitative Analysis Using Content Validity Percentage (CVP) will count as this formula:

- Each expert’s rating for the 5 items is collected, and the total expert score (x) is calculated. The maximum possible score for each item is determined as:
- Maximum Score per Item=7 (experts) × 10 (maximum score per expert) = 70
- For 5 items, the total maximum score is:

Total Maximum Score=70 (per item) × 5 (items) = 350

- To calculate the content validity percentage, the following formula is used:

$$Content\ Validity\ Percentage = \frac{Total\ Expert\ Score\ (x)}{Maximum\ Score\ (650)} \times 100$$

In addition to the quantitative ratings, qualitative feedback from the open-ended sections is thematically analysed to identify key insights related to clarity, feasibility, and suggestions for improvement. These qualitative insights provide valuable details on areas where the module may need adjustment or enhancement (Fowler & Panko, 2020).
By combining these quantitative and qualitative analyses, this step provides a comprehensive assessment of the I-DECOBEST module, allowing for data-driven revisions and improvements based on expert feedback. By combining the CVI-based content validation process outlined by

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Muhammad Saiful Bahri Yusoff (2019) with the expert selection and feedback loop principles from Sidek Noah and Jamaluddin (2005), this process ensures that the IDECOBEST module is rigorously validated. This hybrid approach provides a quantitative measure of content validity while incorporating expert feedback for qualitative refinements, ensuring the module is educationally sound and aligned with its learning objectives. All findings will be discussed in the findings and discussion segments.

Results and Discussion

This section elucidates the findings and discussions about the validity of the experts for the I-DECOBEST Module. It encompasses the profiles of the experts involved in this validity process, the calculation of the Content Validity Percentage (CVP), and the qualitative analysis of the recommendations provided by the experts in the expert comments section of the distributed form.

As illustrated in Table, 7 experts possessing a minimum of five years of experience in disciplines such as education science, electrical engineering, psychology, and counselling were selected to validate the I-DECOBEST modules. Their credentials encompass doctoral and first degrees, ensuring a high level of expertise. The experts occupy positions including Senior Lecturer, Head of Division, and School Headmaster, representing institutions such as public universities, teacher training institutes, and primary schools. Their extensive experience, ranging from 7 to 29 years, encompasses areas such as curriculum design, science education, educational psychology, and electrical engineering. This aligns with industry standards wherein Subject Matter Experts (SMEs) typically require 5-10+ years of experience (Yelon, 2019), instructional designers generally necessitate 5-8 years (Reigeluth & Carr-Chellman, 2020), and educational technologists require 3-5 years (Morrison et al., 2019).

Table 3: Expert Profiles Matrix

Expert Code	Designation	Field and years of expertise	Institution
E1	Senior Lecturer, PhD	Physics (7 years)	School of Physics, Public University
E2	Senior Lecturer, PhD	Curriculum and Instruction (23 years)	Centre of Education Studies, Public University
E3	Specialist, PhD	Science Education (25 years)	Centre for Education in Science and Mathematics, Southeast Asia.
E4	Professor and Dean, PhD	Physics (18 years)	Faculty of Science and Technology, Public University.
E5	Head of Unit, PhD	Psychology and Counselling (10 years)	Teacher Teaching Institution, Public Institution
E6	Senior Science Teacher, Degree	Electrical Engineering/ Science Education (16 years)	Public Primary School

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Expert Code	Designation	Field and years of expertise	Institution
E7	Deputy Dean, Phd	Design and New Media (20 years)	School of Art, Public University

All the experts listed are explained based on the E code, which refers to 'expert' followed by a number to facilitate reference in the description of this study. All validations were received within two to three weeks of the initial meeting with the specialist, either face-to-face or online. All forms completed by experts were analyzed to determine the essence of the scale chosen by experts and their comments. Calculations were performed, and thematic analyses were conducted to identify substantial comments regarding the I-DECOBEST Module.

Validity decision by experts

The five criteria utilized by experts to evaluate the I-DECOBEST module encompass three primary aspects: the module's suitability for the target population, content alignment with instructional time, and its efficacy in enhancing pupils' science process skills, energy literacy, and attitudes toward the electric topic. The following five items require expert selection to establish general validity for the I-DECOBEST Module:

Table 4: Five items for expert evaluation about I-DECOBEST Module

Item No	Item Description
1	The module content is appropriate for its target population.
2	The module content can be perfectly implemented.
3	The module content is appropriate for the time allocated.
4	The module improves students' science process skills, energy literacy, and attitudes towards electricity.

The validity scale administered to the expert is predicated on a semantic scale, wherein '0' denotes strong disagreement and '10' signifies strong agreement with the five items from which the expert must select. Consequently, the following table illustrates the scale chosen by the experts:

Table 5: Expert Review of Scale Options

Item No	E1	E2	E3	E4	E5	E6	E7	Sum
1	9	8	10	10	8	10	9	64
2	10	8	10	7	8	10	9	62
3	9	8	10	7	7	9	9	59
4	10	7	10	8	9	10	9	63
5	10	7	10	9	9	9	9	63

The table presents the results of an expert review evaluating the scale options of a developed educational module. The scores, assigned by seven experts (E1 to E7), provide a quantitative assessment of the module's components across five items. The aggregated scores reveal meaningful insights into the perceived quality and alignment of each item with the intended pedagogical goals.

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Item 1 received the highest total score of 65, indicating a strong consensus among experts regarding its robustness and alignment with educational standards. This suggests that the content or design of this item is well-developed and effectively addresses the intended learning outcomes. On the other hand, Item 3, with a total score of 58, garnered the lowest evaluation, pointing to potential areas for improvement. The relatively lower scores for this item may indicate issues with clarity, relevance, or practical application within the educational context.

The scores for Items 2, 4, and 5, ranging between 62 and 64, demonstrate relatively high expert agreement, albeit with slight variations. Item 2's score of 62 might reflect minor concerns or suggestions for refinement, potentially in its instructional clarity or engagement level. Conversely, Item 4, with a near-top score of 64, suggests that this item is almost as robust as Item 1 but could still benefit from slight enhancements to fully meet expert expectations. Item 5's score of 63 highlights its general effectiveness, with minor room for optimization.

Overall, the data suggest that while the module demonstrates a high level of quality, specific items, particularly Item 3, could be revised to enhance their educational impact. This analysis emphasizes the importance of expert validation in identifying strengths and areas for development, ensuring the module's overall efficacy in achieving its educational objectives.

Calculation of Content Validity Score

In addition to the CVP, the overall content validity score was calculated by summing the ratings given by all experts across all items and dividing this sum by the maximum possible score as suggested by Sidek Noah and Jamaluddin (2005). Content Validation Percentage:

1. Total Expert Score: Sum of all the expert scores for the 5 items:

   $65 + 62 + 58 + 64 + 63 = 311$
2. Maximum Possible Score: For 7 experts rating 5 items, with a maximum possible score of 10 per item:

   $10 \times 7 = 70$ (maximum score per item)
   Total maximum score for 5 items: $70 \times 5 = 350$
3. Content Validity Percentage:

$$\text{Content Validity Score} = \left(\frac{311}{350}\right) \times 100 = 88.86\ \%$$

Based on the expert ratings, the Content Validity of module I-DECOBEST is 88.86 %, which is considered excellent as it significantly exceeds the threshold of 70%. Therefore, according to Sidek Noah dan Jamaluddin (2005), this percentage score indicates the overall validity of the module, wherein a score of 70% or above is deemed indicative of strong content validity (Tuckman & Waheed, 1981; Abu Bakar Nordin, 1995).

Thematic Analysis of Expert Feedback

The expert validation of the educational module has revealed several key themes, aligning with findings from recent studies in educational research. These insights ensure the module's alignment with pedagogical standards and practical classroom implementation.

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Content Relevance and Comprehensiveness emerged as a significant theme, with Experts 1 and 7 emphasizing the module's relevance in enhancing students' understanding of electricity. Expert 1 suggested incorporating the negative impacts of fossil fuel usage, which aligns with Dresser and Potane (2022), who advocate for embedding environmental considerations in learning modules to broaden students' perspectives.

Specificity and Clarification were highlighted by Experts 2 and 3, who recommended clearer articulation of module elements and stronger connections between activities and the conceptual framework (I-DECOBEST). This recommendation is consistent with Cook and Hatala (2016), who stress the importance of detailed instructional design and robust theoretical grounding for effective educational interventions.

Time Management and Practical Feasibility was a concern for Experts 4 and 6. They noted that time constraints and varying student technological proficiency could hinder the completion of activities. These insights mirror findings by Moreira-Mora and Espinoza-Guzmán (2016), who emphasize adequate time allocation to accommodate diverse learning needs and ensure successful integration of technology in education.

General Evaluation from Expert 5 was positive, affirming the module's robust design and its potential to meet learning objectives. This aligns with Dresser and Potane (2022), who highlight the importance of expert validation in reinforcing a module's strengths while identifying areas for improvement.

Table 6 provides a comprehensive overview of the E1 to E7 feedback regarding the assessment of the I-DEOBEST Module. The identified themes correlated with various prior studies to examine the necessity of expert commentary, which offers an alternative perspective that can contribute to the refinement of the I-DECOBEST Module.

Table 6: Expert Feedback and Thematic Analysis Table

Expert	Actual Comment	Theme	Aligned Citation
Expert 1	"Kandungan kursus adalah terperinci...menekankan kesan negatif penggunaan bahan api fosil."	Content Relevance and Comprehensiveness	Dresser and Potane (2022)
Expert 2	"Sila buat pembetulan kepada elemen-elemen yang telah dihuraikan."	Need for Specificity and Clarification	Cook and Hatala (2016)
Expert 3	"Aktiviti yang dirancang perlu diperjelaskan...kerangka konseptual modul I-DECOBEST."	Need for Specificity and Clarification	Cook and Hatala (2016)
Expert 4	"Secara keseluruhan kandungan modul...pengetahuan asas pelajar yang masih diperingkat awal."	Time Management and Practical Feasibility	Moreira-Mora and Espinoza-Guzmán (2016)
Expert 5	"Tahniah modul ini telah dibangunkan dengan baik serta mampu mencapai objektif yang telah ditetapkan."	General Evaluation	Dresser and Potane (2022)
Expert 6	"Masa yang diperuntukkan...murid yang kurang mahir menggunakan komputer."	Time Management and Practical Feasibility	Moreira-Mora and Espinoza-Guzmán (2016)

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Expert 7	"Kandungan modul adalah bertepatan...teori yang dinyatakan dengan baik."	Content Relevance and Theoretical Alignment	Cook and Hatala (2016)

This comprehensive analysis ensures the module is both theoretically sound and practically feasible for classroom implementation.

Conclusion

The I-DECOBEST module achieved a content validity score of 88.86%, validating its effectiveness in enhancing energy literacy, science process skills, and attitudes toward electricity for primary school students. While the module is well-aligned with the KSSR curriculum, expert feedback highlighted the need to improve time allocation for activities, particularly for students with lower digital proficiency, and to clarify the linkages between activities and learning objectives. Additionally, integrating environmental education on fossil fuel use would enhance its relevance. The study's novel interdisciplinary validation approach is a key contribution, providing a model for others to validate educational modules across multiple fields. Further research is recommended to conduct longitudinal impact studies, explore differentiated instructional methods, and adapt the module for different educational contexts. By addressing these improvements, the I-DECOBEST module has the potential to be a leading educational tool in energy literacy and science education.

Acknowledgements

We extend our gratitude and recognition to all the specialists who offered their insights to validate the I-DECOBEST module. We are particularly indebted to the School of Educational Studies at Universiti Sains Malaysia. It is worth noting that this study was conducted without external funding and was carried out independently by the researchers.

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

References

Abu Bakar Nordin (1995). *Pengenalan kepada penyelidikan pendidikan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Brown, A. (2020). *Educational psychology in the classroom: Theory into practice*. London: Sage.

Cook, D. A., & Hatala, R. (2016). Validation of educational assessments: A primer for simulation and beyond. *Advances in Simulation*, 1, 31. Available at: https://advancesinsimulation.biomedcentral.com.

Cunningham, C. M., & Carlsen, W. S. (2021). *Teaching engineering in K-12: Preparing educators to deliver instruction*. *International Journal of STEM Education*, 8(1), 15.

Davies, R., et al. (2019). *Simplifying science: Strategies for primary teachers*. New York: Routledge.

Dresser, R., & Potane, J. (2022). Fundamentals of Arnis: Self-learning module experts' validation and learners' feedback. *Canadian Journal of Educational and Social Studies*, 2(2), 11–25.

Dunn, K., & Leeson, B. (2020). Validation methods for curriculum design in primary education. *Journal of Curriculum Studies*, 52(4), 521-540.

Fowler, L., & Panko, M. (2020). *Educational technology: Practical applications in teaching and learning*. London: Routledge.

Fujikawa, T., et al. (2020). Cognitive development in primary science: Challenges in teaching electricity. *Journal of Science Education*, 45(3), 233–249.

Gita, R., et al. (2023). Science literacy and electrical material in primary education. *Journal of Elementary Science Education*, 12(1), 15–29.

Graham, C., et al. (2020). *Blended learning in K-12: Evidence-based practices*. New York: Springer.

Hashim, H., Yunus, M. M., & Embi, M. A. (2019). Development of a digital module for ESL learners: A design and development approach. *International Journal of Emerging Technologies in Learning (iJET)*, 14(7), 153–174.

Jones, K., et al. (2019). *Using technology in education: Maximizing learning outcomes*. New York: Pearson Education.

Leontini, R., et al. (2023). Mobile storytelling and energy literacy in primary education. *European Journal of Educational Research*, 8(2), 234–247.

Morais, C., & Miranda, G. (2019). Inquiry-based learning and design thinking in primary education. *Journal of Primary Education Research*, 14(5), 220–230.

Moreira-Mora, T., & Espinoza-Guzmán, J. (2016). Initial evidence to validate an instructional design-derived evaluation scale in higher education programs. *International Journal of Educational Technology in Higher Education*, 13(11). Available at: https://educationaltechnologyjournal.springeropen.com.

Muhammad Saiful Bahari Yusoff (2019). Content validity index: Are you sure you know what's being reported? *Journal of Education and Health*, 12(2), 23–34.

Mustadi, A., et al. (2023). Energy literacy and science process skills in primary education. *Journal of Educational Research and Development*, 17(3), 122–135.

Ng, P. Y., & Adnan, M. (2018). Kurikulum Standard Sekolah Rendah: A focus on science education. *Malaysian Journal of Curriculum Studies*, 26(1), 45–62.

Noroozi, O., et al. (2021). Educational module design for enhancing critical thinking skills through peer feedback. *Education and Information Technologies*, 26, 4317–4334.

Polit, D. F., & Beck, C. T. (2021). *Essentials of nursing research: Appraising evidence for nursing practice*. 10th ed. Philadelphia: Wolters Kluwer.

Volume: 10 Issues: 73 [June, 2025] pp. 703 - 716
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107358

Reigeluth, C. M., & Carr-Chellman, A. A. (2020). *Instructional-design theories and models: Building a common knowledge base*. New York: Routledge.
Sawyer, R. K., & van de Ven, A. H. (2021). *The science of learning in the classroom: Developing expertise in teaching and assessment*. London: Cambridge University Press.
Schleser, S., et al. (2023). Energy literacies and community engagement in primary schools. *International Journal of Science Education*, 45(1), 45–62.
Sidek Noah, S. M., & Jamaluddin, S. (2005). *Penyelidikan dan pembangunan dalam pendidikan*. Kuala Lumpur: Universiti Malaya Press.
Sissamperi, K., & Koliopoulos, D. (2021). Teaching energy systems in primary school: An inquiry-based approach. *Journal of Science Education and Technology*, 30(4), 421–435.
Tomlinson, C. A. (2018). *The differentiated classroom: Responding to the needs of all learners*. 2nd ed. Alexandria: ASCD.
Tuckman, B. W., & Waheed, M. A. (1981). Evaluation of instructional modules for improving science process skills. *Journal of Educational Psychology*, 73(6), 915–921.
Van Driel, J. H., et al. (2020). Validating a professional development module for science teachers: Design and outcomes. *International Journal of Science Education*, 42(10), 1681–1702.
Yelon, S. (2019). *The art and science of instructional design*. 3rd ed. Boston: Cengage Learning.
Zahra, R., et al. (2020). *Creating inclusive educational resources: A guide for practitioners*. Oxford: Blackwell Publishing.