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Development of An Islamic Values Based E-Module for Vocational Culinary Skills on Occupational Safety and Health for Students with Mild Intellectual Disabilities

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Abstract: *This study aims to: (1) develop an Islamic-value based e-module for vocational culinary skills focusing on occupational safety and health (OSH) for students with mild intellectual disabilities; (2) determine the feasibility of the e-module based on expert evaluations; and (3) examine the usefulness and effectiveness of the developed e-module. The study employed a Research and Development (R&D) method using the ADDIE model, which consists of the analysis, design, development, implementation, and evaluation stages. Validation was conducted by one subject-matter expert, one media expert, and three teachers. The usefulness and effectiveness trials involved eight students with mild intellectual disabilities at a state special school (SLBN) in Bengkulu City, Indonesia. Data were analyzed using qualitative and quantitative descriptive analysis. The results indicate that: (1) the Islamic values–based OSH e-module for culinary vocational skills was successfully developed as a learning resource that emphasizes safety, caution, and responsibility in the workplace, in line with the Islamic principle of safeguarding human life (ḥifẓ al-nafs); (2) feasibility evaluation results showed that the subject-matter expert awarded a score of 97% ("Highly Feasible"), the media expert 83.2% ("Highly Feasible"), and the teachers 92.3%, 94%, and 97%, respectively (all categorized as "Highly Feasible"); and (3) the trial results demonstrated a usefulness level of 94% ("Highly Useful"), along with a statistically significant difference between pre-test and post-test scores (p = 0.011). Therefore, the Islamic values–based OSH e-module for culinary vocational skills is considered feasible, useful, and effective for vocational learning among students with mild intellectual disabilities.*

Keywords: *Students with Mild Intellectual Disabilities, E-Module, Occupational Safety and Health in Culinary Arts, Vocational Skills, Islamic Values*

INTRODUCTION

Vocational skills education plays a crucial role in preparing students to enter the workforce. In this context, culinary arts represent a highly relevant field of vocational training. Culinary education encompasses various aspects, ranging from the introduction of food ingredients and food processing techniques to the principles of occupational safety and health (OSH) in the kitchen (Nurfadillah et al., 2024). For students with mild

intellectual disabilities, this form of education is designed to help them acquire practical skills that can be applied in daily life. These skills are essential not only for enhancing students' independence but also for preparing them to face challenges in the workplace.

Students with mild intellectual disabilities are individuals who experience deficits in intellectual and adaptive functioning that affect their ability to function in various aspects of life (DSM-5, 2022). Although their intellectual capacity is below average, they still possess the potential to learn and develop in specific areas. Therefore, appropriate educational interventions are necessary to support them in overcoming learning difficulties, particularly in understanding and applying occupational safety and health principles in kitchen settings. Previous research indicates that students with mild intellectual disabilities often struggle to process abstract information, which limits their ability to identify potential hazards in their working environment (Schalock et al., 2021).

Occupational safety and health (OSH) in culinary practice constitutes a critical component of vocational education. Kitchen environments involve various risks that may endanger students' safety, including physical hazards from sharp tools, chemical hazards from cleaning agents, and biological hazards resulting from inadequate sanitation practices (Mastiani et al., 2021). Consequently, a comprehensive understanding of OSH must be emphasized in the learning process. This emphasis is intended not only to enhance students' culinary competencies but also to ensure their safety while working in high-risk kitchen environments. Mastery of OSH principles is therefore essential to enable students to work safely and efficiently.

From the perspective of Islamic studies, occupational safety and health are integral to the fundamental principle of protecting human life (ḥifẓ al-nafs), which is one of the primary objectives of maqāṣid al-sharīʿah. Islam emphasizes prudence, responsibility, and preventive efforts against all forms of harm in work-related activities, including food preparation in the kitchen. The principle of lā ḍarar wa lā ḍirār (causing neither harm to oneself nor to others) serves as an ethical foundation that is particularly relevant to OSH education, especially for students with mild intellectual disabilities who have limitations in risk recognition. Therefore, OSH instruction in culinary vocational skills not only encompasses technical and pedagogical dimensions but also incorporates moral and religious values that emphasize the importance of safeguarding oneself, the environment, and

others as a form of responsibility and trust (amānah) in the workplace.

Based on the results of an assessment conducted at State Special School 5 (SLBN 5) in Bengkulu City, it was found that the majority of students with mild intellectual disabilities had not yet mastered key indicators of occupational safety and health in the kitchen. The assessment results revealed that 75% of students experienced difficulties in understanding basic OSH procedures, such as the use of personal protective equipment and the safe handling of sharp tools. This finding indicates that the instructional methods currently employed have not been effective in meeting students' learning needs (Sukamto & Wibowo, 2019). Other studies have similarly reported that most students are unable to apply proper hygiene practices, which are essential for maintaining health and safety in kitchen environments (Rahayu & Suryani, 2021).

To address these challenges, the development of instructional materials that align with the characteristics of students with mild intellectual disabilities is required. One potential solution is the development of digitally based learning e-modules. E-modules offer advantages in presenting learning content in an interactive and engaging manner, which can enhance students' learning motivation. In this regard, e-modules can be designed based on multimedia learning theory, which emphasizes the importance of visual and interactive information presentation to facilitate understanding (Mayer, 2024). By utilizing technologies that are familiar to students, the learning process is expected to become more effective and enjoyable.

The development of an e-module for vocational culinary skills focusing on occupational safety and health for students with mild intellectual disabilities represents a strategic approach to addressing educational needs in this context. Through an appropriate instructional design, students are expected to better understand and apply OSH principles, enabling them to work safely and independently in kitchen environments. Thus, the development of this e-module aims not only to improve learning outcomes but also to foster students' independence and self-confidence in facing challenges in the world of work.

METHOD

Educational development research may produce various types of products, including learning models, instructional media, teaching aids, textbooks, learning modules, assessment instruments, instructional devices, curricula, and school policies (Okpatrioka, 2023). Research and

Development (R&D) refers to a systematic process or sequence of steps undertaken to develop new products or to refine existing ones. This approach encompasses a series of research methods aimed at producing a specific product and testing its effectiveness. The primary objective of R&D is to generate new products or improve existing ones while enhancing efficiency and effectiveness through innovation (Loso Judijanto et al., 2024).

This study employed the ADDIE development model, which consists of five stages: Analysis, Design, Development (or Production), Implementation (or Delivery), and Evaluation. The procedures for developing the e-module followed these five stages of the ADDIE model: analysis, design, development, implementation, and evaluation.

During the analysis stage, a needs assessment was conducted at State Special School 5 (SLBN 5) in Bengkulu City. Data were collected through interviews with teachers who teach students with intellectual disabilities at the school. The interview results indicated that occupational safety and health (OSH) in culinary education is considered essential for students with mild intellectual disabilities. This is because culinary activities involve various practical tasks that carry potential risks of accidents, such as the use of sharp tools, hot equipment, and food ingredients. Therefore, OSH instruction serves as a fundamental basis for fostering safe work behaviors and preventing accidents during the learning process.

The development of the e-module involved two expert validators: a subject-matter expert and a media expert. The subject-matter expert evaluated the relevance, accuracy, and feasibility of the content included in the developed e-module. Meanwhile, the media expert assessed the visual appearance, image quality, and overall design of the e-module. In addition to the expert validators, three teachers from SLBN 5 Bengkulu City were involved in the evaluation process. These teachers had extensive experience in teaching students with mild intellectual disabilities.

To analyze the feasibility of the product, the researchers measured feasibility data using a Likert-scale assessment. The feasibility scoring criteria ranged from “Highly Feasible” (score of 5) to “Highly Infeasible” (score of 1), adapted from Sugiyono (2013). The feasibility level was determined using a percentage-based criterion, calculated using the following formula:

$$\text{Feasibility Percentage (\%)} = \frac{\text{Observed Score}}{\text{Expected Score}} \times 100\%$$

The feasibility criteria were classified as follows: 80–100% (Highly Feasible), 60–

80% (Feasible), 40–60% (Less Feasible), 20–40% (Infeasible), and 0–20% (Highly Infeasible) (Prihatiningtyas et al., 2023).

To measure students' responses to the developed e-module, a questionnaire was administered to students with mild intellectual disabilities. The response scoring criteria ranged from "Highly Useful" (score of 5) to "Highly Not Useful" (score of 1), adapted from Sugiyono (2013) as cited in Arigiyati et al. (2018). The percentage-based qualitative criteria for usefulness were classified as follows: 86–100% (Highly Useful), 71–85% (Useful), 56–70% (Moderately Useful), 41–55% (Less Useful), and below 40% (Failed) (Arikunto, 2018).

In addition to completing the questionnaire, students were administered pre-test and post-test assessments delivered through the OSH e-module for culinary vocational skills. The theoretical learning outcomes obtained from the e-module implementation were analyzed using the Wilcoxon Signed Rank Test. This non-parametric test was selected because it is suitable for comparing paired data, specifically students' learning outcomes before and after the use of the e-module. The analysis produced descriptive statistics, rankings of pre-test and post-test scores, and conclusions regarding hypothesis testing, indicating whether the alternative hypothesis (H_1) was accepted or the null hypothesis (H_0) was retained.

In this analysis, μWR represents the Wilcoxon mean rank, Sp denotes positive ranks, Sn denotes negative ranks, Σt represents the sum of ranks of negative differences, and Zw refers to the Z-score used to test statistical significance.

RESULT AND DISCUSSION

Occupational safety and health (OSH) in kitchen settings constitutes a critical component of vocational education that must be thoroughly understood by students with mild intellectual disabilities. Kitchen environments inherently involve multiple hazards, including physical risks from sharp tools and hot equipment, chemical risks from cleaning agents, and biological risks related to food hygiene and sanitation. For students with mild intellectual disabilities, these risks may be amplified due to limitations in cognitive processing, risk perception, and adaptive behavior. Consequently, effective OSH instruction is essential not only to prevent accidents but also to promote hygienic practices that reduce the likelihood of food contamination and health-related issues.

Students with intellectual disabilities are generally characterized by intellectual functioning below the population average, delayed developmental trajectories, and limitations in adaptive

behavior that affect daily functioning (Hidayah et al., 2014). Despite these limitations, students with mild intellectual disabilities often retain foundational academic skills, such as basic reading, writing, and arithmetic. However, they tend to experience significant challenges in higher-order cognitive processes, including abstract reasoning, problem-solving, and information integration. These cognitive characteristics necessitate instructional approaches that are concrete, structured, and supportive of gradual learning progression, particularly in vocational contexts that demand procedural accuracy and safety awareness.

The development of the culinary OSH e-module in this study was grounded in the Cognitive Theory of Multimedia Learning (CTML), which provides a strong theoretical framework for addressing the cognitive needs of learners with mild intellectual disabilities. CTML posits that learners process information through two distinct channels—visual and verbal—and that learning is optimized when instructional materials are designed to manage cognitive load effectively (Mayer, 2024). By presenting information through coordinated visual and verbal elements, CTML-based instruction minimizes extraneous cognitive load while enhancing germane cognitive processing, thereby facilitating deeper understanding.

For students with mild intellectual disabilities, limitations in working memory capacity and difficulties in processing complex or abstract information often hinder effective learning. The culinary OSH e-module was therefore designed to align with CTML principles by presenting safety concepts through simplified text accompanied by relevant images, illustrations, animations, and short instructional videos. This multimodal approach allows students to receive information through multiple sensory channels, increasing the likelihood of comprehension and retention. The alignment between CTML principles and the cognitive profiles of students with mild intellectual disabilities suggests that the instructional design of the e-module is theoretically sound and pedagogically appropriate.

One of the key advantages of CTML-based instruction is its ability to support concrete learning. Students with mild intellectual disabilities generally demonstrate stronger comprehension when learning materials are grounded in real-life contexts and tangible examples rather than abstract explanations. In this study, the e-module incorporated visual representations of kitchen tools, personal protective equipment (PPE), fire extinguisher operation procedures, and first-aid responses to common kitchen accidents.

These visual elements helped students form clear mental representations of OSH concepts, enabling them to better understand potential hazards and appropriate preventive measures.

The use of videos and step-by-step visual demonstrations further enhanced learning by illustrating correct procedures in a sequential and observable manner. For example, videos showing the correct use of knives, handling of hot cookware, or response to minor burns provided students with concrete models of safe behavior. Such visual modeling is particularly effective for students with mild intellectual disabilities, who often benefit from observational learning and repeated exposure to exemplars. By reducing reliance on abstract verbal instruction, the e-module addressed a common barrier faced by this learner population.

In addition to facilitating comprehension, the CTML-based e-module supported the principles of learning by doing and repetition, which are central to effective instruction for students with mild intellectual disabilities. These students often require repeated exposure to learning materials to achieve mastery, as their rate of information processing and retention may be slower than that of typically developing peers. The digital format of the e-module allowed students to revisit instructional content multiple times at their own pace, thereby reinforcing learning without inducing anxiety or pressure.

The availability of reusable instructional videos and illustrations enabled students to engage in self-paced learning, which is consistent with best practices in special education. Individualized and step-by-step instruction is widely recognized as essential for learners with intellectual disabilities, as it allows them to build understanding incrementally and gain confidence before progressing to more complex tasks. The flexibility offered by the e-module thus represents a significant advantage over traditional, teacher-centered instructional approaches that may not adequately accommodate individual learning differences.

The feasibility of the culinary OSH e-module was evaluated through expert validation and teacher assessments, yielding highly positive results. The subject-matter expert awarded a feasibility score of 97%, indicating that the content was accurate, relevant, and appropriate for the target learner population. The media expert provided a score of 83.2%, reflecting strong evaluation of the visual design, layout, image quality, and overall usability of the e-module. Furthermore, three teachers with extensive experience teaching students with mild intellectual

disabilities rated the e-module at 92.3%, 94%, and 97%, respectively. These consistently high scores across different evaluators demonstrate that the e-module meets both pedagogical and technical standards for instructional use.

Following the feasibility evaluation, the e-module was implemented in a trial involving eight students with mild intellectual disabilities. The usefulness of the e-module was assessed through a student response questionnaire consisting of 18 items rated on a five-point Likert scale. The results indicated a total score of 675, corresponding to a usefulness percentage of 94%, which falls within the "highly useful" category. Students expressed positive perceptions of the e-module across multiple dimensions, including visual appeal, ease of navigation, clarity of language, and attractiveness of the instructional content.

These findings suggest that the e-module was well received by students and that its design effectively supported engagement and motivation. For students with mild intellectual disabilities, motivation is a critical factor influencing learning outcomes, as frustration and disengagement can quickly arise when instructional materials are perceived as too complex or inaccessible. The positive student responses indicate that the e-module successfully created a supportive and engaging learning environment conducive to sustained attention and participation.

The effectiveness of the culinary OSH e-module was further examined through a comparison of students' pre-test and post-test scores. Prior to using the e-module, students' pre-test scores ranged from 20 to 60, indicating limited initial understanding of OSH concepts. After completing the e-module, post-test scores increased dramatically to a range of 90–100, reflecting substantial improvement in students' knowledge and comprehension. This marked increase demonstrates that the e-module had a significant positive impact on students' learning outcomes.

To statistically validate these findings, the pre-test and post-test data were analyzed using the Wilcoxon Signed Rank Test, a non-parametric test appropriate for paired data with small sample sizes. The test results revealed a statistically significant difference between pre-test and post-test scores, confirming that the observed improvements were not due to chance. These results provide strong empirical evidence supporting the effectiveness of the culinary OSH e-module in enhancing students' understanding of occupational safety and health.

Beyond pedagogical and cognitive outcomes, the results of this study can also

be interpreted within the framework of Islamic educational values. The improvement in students' understanding of OSH principles reflects not only enhanced technical competence but also the development of attitudes aligned with ethical and moral values emphasized in Islamic teachings. Concepts such as caution, responsibility, and adherence to safety procedures resonate with the Islamic principle of amānah (trust), which emphasizes accountability and conscientiousness in fulfilling one's duties.

From an Islamic perspective, efforts to protect oneself and others from harm are central to the principle of ḥifẓ al-nafs (the preservation of life), one of the primary objectives of maqāṣid al-sharīʿah. In the context of vocational education, particularly in potentially hazardous environments such as kitchens, adherence to OSH principles can be viewed as a practical manifestation of this ethical imperative. By internalizing safety practices, students not only learn to perform tasks correctly but also develop moral awareness regarding the importance of safeguarding life and well-being.

Accordingly, the culinary OSH e-module functions not merely as a technical instructional tool but also as a medium for values education. Through its emphasis on safe work practices, hygiene, and responsibility, the e-module supports the internalization of ethical values that promote disciplined, orderly, and conscientious behavior. This dual focus on skill development and moral formation is particularly significant for students with mild intellectual disabilities, as it contributes to their holistic development and prepares them for meaningful participation in both professional and social contexts.

Overall, the findings related to feasibility, usefulness, and effectiveness indicate that the developed culinary OSH e-module is not only suitable for instructional use but also capable of producing meaningful improvements in learning processes and outcomes. The integration of CTML principles, digital technology, and Islamic values represents a comprehensive approach to vocational education for students with mild intellectual disabilities. These results suggest that e-module–based instructional technology can serve as an effective alternative or complement to traditional teaching methods in special education settings.

In particular, the use of e-modules is highly advantageous for instructional content that requires procedural understanding, repeated practice, and strong emphasis on safety. Within special schools, where instructional resources and individualized support may be limited,

digital e-modules offer a flexible and scalable solution that can enhance educational quality. Future research may explore the long-term impact of such e-modules on students' work readiness and real-world application of OSH skills, as well as their adaptability to other vocational domains.

CONCLUSION

This study successfully developed a culinary Occupational Safety and Health (OSH) e-module designed for eleventh-grade students with mild intellectual disabilities at the senior secondary special education level (SMALB). The e-module was developed to enhance students' understanding of occupational safety and health in the culinary field and to support flexible learning that can be accessed anytime and anywhere.

The feasibility evaluation results indicated that the developed e-module was highly suitable for implementation. The subject-matter expert rated the e-module as "Highly Feasible" with a score of 97%, while the media expert awarded a score of 83.2%, also categorized as "Highly Feasible." Additionally, three teachers provided feasibility scores of 92.3%, 94%, and 97%, respectively, all of which fell within the "Highly Feasible" category. To assess the effectiveness of the e-module, pre-test and post-test assessments were conducted. The results revealed a statistically significant difference between pre-test and post-test scores ($p = 0.011$), indicating a substantial improvement in students' understanding of occupational safety and health in culinary practices after using the e-module.

The observed improvement in students' understanding demonstrates that OSH learning through the developed e-module functions not only to strengthen technical skills but also to cultivate attitudes of caution, responsibility, and safety awareness in the workplace. These outcomes are consistent with the Islamic educational principle of safeguarding human life (ḥifẓ al-nafs), suggesting that the culinary OSH e-module supports vocational learning that emphasizes not only job-related skills but also the development of ethical values and work ethics among students with mild intellectual disabilities.

Based on the findings, several practical recommendations can be proposed. For teachers, the culinary OSH e-module can be utilized both as a self-learning resource and as a teacher-assisted instructional tool, enabling students to learn more flexibly under appropriate supervision. For school principals, the e-module may serve to enrich school learning resources for students with mild intellectual disabilities, particularly in the

area of culinary occupational safety and health, while also introducing innovative, technology-based instructional materials. For parents, it is recommended that they accompany and support students when using the culinary OSH e-module at home, especially in assisting with device operation and ensuring that students follow the instructional guidance provided. Finally, for education authorities, the e-module may be used as a reference material for designing and implementing training programs aimed at improving vocational safety education for students with mild intellectual disabilities.

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