

## *E-Module in TVET: Unveiling Brazing and Riveting Methods Through VAK Learning*

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### **Abstract**

The electronic module (e-module) concern within the realm of Technical and Vocational Education and Training (TVET) pertains to the obstacles related to the incorporation and proficient utilization of electronic learning resources in vocational education systems. The issues discussed involve several factors, including insufficient digital infrastructure, restricted technological accessibility, differing degrees of digital literacy among educators and learners, and the necessity for comprehensive training and assistance to facilitate the smooth integration of e-module. This research focuses on the creation of an educational e-module for vocational colleges, specifically targeting the refrigeration and air conditioning program. The instructional material is designed to cater various learning styles, including visual, auditory, and kinesthetic (VAK) approaches. The purpose of this e-module is to facilitate the acquisition of knowledge for both teachers and students through the utilization of high-quality reference materials for the Fabrication of Piping, Tubing, and Metal topics. The researcher employed a semi-structured interview as the research instrument to evaluate the usability of the learning e-module in this study. Subsequently, the interview data will undergo thematic analysis and subsequently be assessed using Cohen's Kappa statistic, which will ascertain the level of agreement over the usefulness of the e-learning module. The findings of this study indicate that the e-module created possesses attributes of interest and suitability, rendering it a viable resource for reference purposes. The development of this learning e-module is anticipated to yield benefits for both instructors and students in the teaching and learning process.

Keywords: Educational Module, E-Module, Technical and Vocational Education and Training (TVET), VAK Model

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## **Introduction**

The education system in Malaysia is experiencing changes in line with advancements in Information and Communication Technology (ICT) as it follows the trajectory of modernity (Lapammu & Mahamod, 2018). The advancement in the domain of ICT has the potential to bring about significant transformations in contemporary education, particularly in the teaching and learning practices of the present age. The current era of technological progress has led to a significant increase in the need for proficient and highly skilled labor across several industrial domains. Furthermore, the establishment of collaborations between TVET institutions and industry entities can encompass several aspects such as the provision of training facilities, practical on-the-job training, and internship opportunities. These collaborative efforts serve to enhance trainees' comprehension of industry requirements and equip them with the necessary skills to effectively tackle real-world employment demands (Ramamurthy, Alias & DeWitt, 2021). Hence, the interconnectedness of TVET, e-modules and the industry serve to narrow the divide between formal education and the practical realm of employment, so enhancing the calibre and applicability of the workforce generated.

The e-module concern within the realm of TVET pertains to the obstacles related to the incorporation and proficient utilization of electronic learning resources in vocational education systems. The issues discussed involve several factors, including insufficient digital infrastructure, restricted technological accessibility, differing degrees of digital literacy among educators and learners and the necessity for comprehensive training and assistance to facilitate the smooth integration of e-modules (Johar & Abdullah, 2019). To effectively tackle this matter, it is imperative to adopt a holistic approach encompassing various measures such as allocating resources towards digital infrastructure, implementing comprehensive training initiatives for educators, and creating a supportive ecosystem that facilitates the seamless integration of e-modules (Abi Hamid, Yuliawati & Aribowo, 2020). These efforts will ultimately contribute to the improvement of both the caliber and availability of TVET programs.

This research focuses on the development of an educational e-module for vocational colleges, specifically targeting the refrigeration and air conditioning program by applying ADDIE Model. The instructional material is designed to cater various learning styles, including visual, auditory, and kinesthetic (VAK) approaches. The purpose of this e-module is to facilitate the acquisition of knowledge for both teachers and students through the utilization of high-quality reference materials for the Fabrication of Piping, Tubing, and Metal topics. Later, the developed e-module will be tested to understand the result of its' usability.

Upon these introductions, this paper is organized on the following sections: literature review, methodology (by of the application of ADDIE Model), results and discussions, and conclusion. The later part will contain acknowledgement and the list of references.

## **Literature Review**

The transformation of vocational education represents a concerted endeavor to enhance the capacity and effectiveness of the vocational education system. According to Noridah (2020), it has the potential to facilitate the transition of the nation into a high-income country. The primary objective of technical and vocational education is to cultivate a cohort of individuals who has extensive expertise and proficiency in specific domains (Krismadinata et al., 2020). Hence, it is imperative that the instructional methods employed in vocational education be

engaging and have the ability to captivate students, thereby encouraging their enrolment in the various disciplines offered by institutions like Vocational Colleges, in alignment with the evolving era of information and communication technology.

According to Aziz & Sieng (2019), e-learning is considered an innovative approach inside the reformed education system, with the intention of supplanting the current educational framework. The utilization of ICT as a facilitator in the process of pedagogy and the promotion of self-directed learning is a prominent educational approach. This strategy proves to be highly effective, particularly with the implementation of computer-based learning modules, such as teaching aids. To optimize the efficacy of the teaching and learning process, it is imperative to incorporate teaching aids as a technological tool and learning resource to ensure a robust educational experience. The utilization of teaching aids has the potential to enhance the learning experience by captivating students' attention and facilitating a deeper comprehension of the instructional material (Bakhir, et al., 2016).

Hence, the utilization of teaching aids is strongly advocated for the purpose of online education. According to Siregar, Suhardi & Munandar (2022), teaching aids encompasses various categories, one of which pertains to non-electronic teaching aids that continue to be utilized in a manual manner. Subsequently, electronic teaching aids refer to instructional tools that employ electronic devices to elucidate educational slides to students. Consequently, the use of Adaptive Blended Learning Models has the potential to facilitate students' comprehension of course content. In contemporary times, educators persist in utilizing textbooks as the primary means of accessing reference materials (Alalwan et al., 2020). This finding indicates a higher prevalence of teachers employing traditional instructional approaches compared to e-learning methodologies. The utilization of the teaching aids through e-learning application approach has garnered significant attention and recognition. This phenomenon can be attributed to the widespread availability of online resources, which can be accessed conveniently from any location, as opposed to the traditional method of in-person learning (Saito & Tangkiengsirisin, 2023).

Alternative approaches such as the one mentioned are highly beneficial within the context of the Professional Development Program (Leary et al., 2020). Moreover, instructors have demonstrated a commendable commitment to staying abreast of contemporary advancements in technology. Nevertheless, there exist certain limitations, such as the prerequisite for instructors or students to maintain uninterrupted internet connectivity in order to avail themselves of reference materials. Enhancements to e-modules have the potential to enhance and foster pupils' cognitive abilities. Teaching aids strategies, such as the utilization of e-modules incorporating videos and pictures, are recommended to be emphasized due to their potential to enhance student comprehension.

Every student possesses an individualized learning style that facilitates their comprehension of the instructional material presented by the teacher. The learning style of a student is a significant determinant in enhancing the caliber of their learning experience. The incorporation of visual, auditory, and kinesthetic learning methods, sometimes referred to as VAK, is crucial in the educational process (Purwasih et al., 2022). Given this circumstance, the significance of learning style in the educational process cannot be overstated, as it enables educators to design instructional experiences and serve as a compass for tailoring teaching methods to suit individual students (Mahadi, Husin & Hassan, 2022). In order to accommodate the diverse learning styles of pupils, it is imperative for instructors to furnish a

range of learning tools. This facilitates an equitable learning experience for all students, enabling them to maximize their learning potential and get equal educational resources.

According to Rahman et al. (2015), vocational students often experience a sense of boredom during the instructional and learning procedures, leading to a lack of enthusiasm in acquiring comprehensive knowledge of learning theory. The impact of this issue has had a detrimental effect on students' knowledge and abilities, resulting in low theoretical scores in the context of teaching and learning in technical and vocational. This is particularly evident in disciplines that prioritize practical aspects over theoretical ones, leading to a lack of in-depth knowledge development among students (Mansurjonovich & Davronovich, 2023). The e-module that has been designed utilizes the VAK learning method, as it aligns well with the subject matter of Joining Metal by Brazing and Riveting. These particular topics necessitate students to engage in hands-on activities and possess a solid understanding of the subject matter in order to effectively carry out practical work.

The absence of well-defined modules and limited availability of reference materials provide challenges for students engaging in self-directed study. Vocational students encounter time limitations in their learning process and are often confronted with a shortage of appropriate resources and equipment (Akhmedov, 2019). Given the aforementioned circumstances, it becomes apparent that there exists a necessity to modify the pedagogical approach by including interactive learning tools, such as teaching aids, specifically e-modules. This implementation has the potential to enhance students' comprehension and engagement, particularly within the realm of technical subjects. Consequently, the implementation of this e-module will facilitate students' acquisition of knowledge pertaining to the subject matter at hand (Fahrurrozi et al., 2023).

Given the moderate level of student proficiency in the selected course and the absence of specific modules pertaining to this subject, the researcher has devised an e-module for the subjects of Joining Metal through Brazing and Riveting. This module is intended for students enrolled in the Refrigeration and Air Conditioning Technology program at the Vocational College. It serves as a high-quality, engaging, and adaptable medium for learning, as well as a valuable source of reference. Hence, it is anticipated that the creation of this e-module will enhance students' comprehension, abilities, and accomplishments, while also fostering a beneficial influence on the educational system, resulting in the production of well-rounded and competitive graduates.

Thus, this study aims to create an educational e-module that focuses on the subject of Join Metal by Brazing and Riveting. The e-module is designed to cater primarily to students enrolled in the Refrigeration and Air Conditioning Technology program. The objective is to enhance students' proficiency in the subject matter and enhance their capacity to use the acquired information within the industry. In general, the incorporation of contemporary pedagogical approaches, namely through electronic learning, serves to augment the educational system and provide students with the necessary skills to meet the requirements of the ever-changing labor market. The emphasis placed on vocational education and the acquisition of specialized technical skills is in accordance with the demands of the nation's industrial sectors.

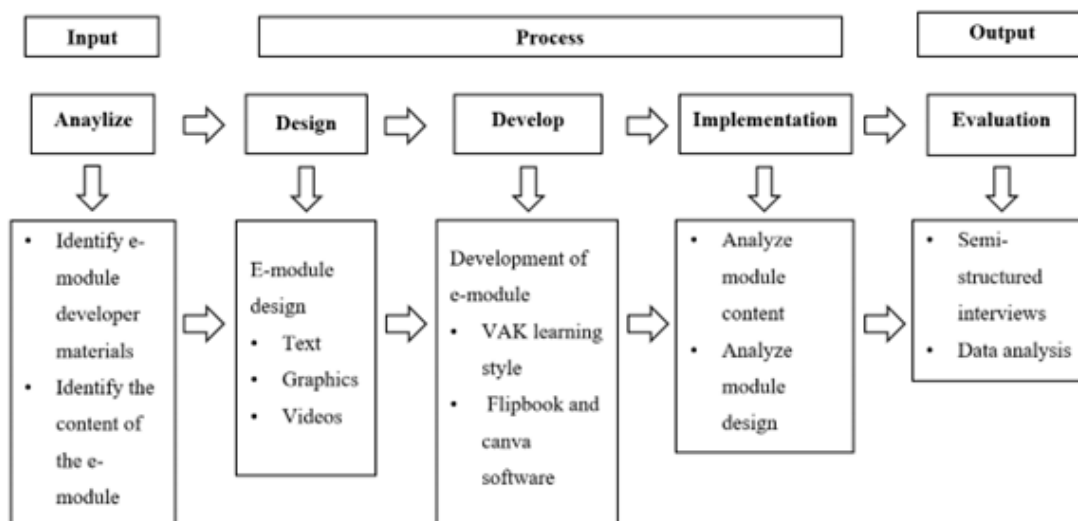


Figure 1: Research Procedure for the Development of Join Metal by Brazing and Riveting E-Module

The VAK learning style encompasses three fundamental components, namely auditory, visual, and kinaesthetic modalities. This particular learning style encompasses three distinct modalities via which pupils acquire knowledge: visual, auditory, and kinaesthetic. A visual learner is an individual who demonstrates a preference for acquiring knowledge via the utilization of illustrations or pictures. Conversely, an auditory learner is one who exhibits a propensity for learning by actively listening to explanations or engaging in conversations with others. Lastly, a kinaesthetic learner is characterized by a preference for practical, hands-on learning experiences (Bakri, Rahman & Jabu, 2019). The primary focus of this e-module will be on the Joining Metal by Brazing and Riveting topic, which are integral components of the refrigeration and air conditioning technology program. The e-module was created as an educational resource for first-year students enrolled in the refrigeration and air conditioning technology program at the Vocational College. The objective of the e-module is to enhance students' proficiency in the subject matter and enhance their capacity to effectively use the acquired information within the industry. The emphasis placed on vocational education and the acquisition of specific technical skills is in accordance with the demands of the nation's industrial sectors.

Hence, the implementation of this e-module will facilitate students in acquiring knowledge pertaining to the relevant subjects. Given the moderate level of student proficiency in the selected course and the absence of specific modules pertaining to this subject, the researcher has devised a learning electronic module focusing on the concepts of joining metal through brazing and riveting. This module is intended for students enrolled in the Refrigeration and Air Conditioning Technology program at the Vocational College. It serves as a high-quality, engaging and adaptable learning tool, as well as a valuable source of reference material. Hence, the researcher anticipates that the creation of this e-module will enhance students' comprehension, abilities, and accomplishments, while also positively influencing the education system to cultivate well-rounded and competitive graduates.

## Methodology

This study employs the Design Development Research (DDR) framework, with a specific focus on utilizing the ADDIE model. The DDR is a method employed for the purpose of

constructing targeted goods. In the context of this study, the ADDIE model (Analysis, Design, Development, Implementation and Evaluation) has been selected as the framework for product creation. The process of data collection entails employing a quantitative data, which enables the researcher to acquire information from participants. The research will encompass a minimum of three participants who were educators (users of the product) in order to assess the usability of the e-module that has been developed. The study employs a combination of quantitative methodologies. The collection of data was conducted through interviews in order to evaluate the usability of the e-module, whereas quantitative approaches are employed to analyze the data derived from these interviews. The ADDIE model is chosen due to its compatibility with the development design of the e-module and its provision of an organized and systematic approach encompassing five distinct phases, namely analysis, design, development, implementation and evaluation (Molenda, 2003). The model is renowned for its ability to generate high-quality e-module. The appropriateness of the ADDIE model and the incorporation of quantitative approaches are crucial in attaining the study objectives and generating an authentic and dependable e-module for the Fabrication of Piping, Tubing and Metal course.

### **i. Analysis**

The analysis step holds significant importance in the development of suitable instructional materials. In order to gather pertinent data for the study, the researcher implemented a series of procedures aimed at identifying the challenges encountered by students and teachers. To this end, a preliminary survey was done, employing a method including the search and analysis of the identified issues. The researcher has undertaken a survey by reviewing existing studies via an online search. The researcher systematically examines and evaluates all relevant data and information acquired from diverse sources, afterwards organizing and interpreting it in accordance with the conducted research. Furthermore, the researcher conducted an analysis of the suitable developmental resources employed for the creation of the electronic module, as well as the information encompassed inside such module. In order to ascertain the content of the e-module and identify suitable development materials for this instructional e-module, the researcher conducted a comprehensive analysis of the available information from diverse sources. Subsequently, the data was processed in accordance with the relevance to the ongoing study.

The objective of this study is to ascertain the primary challenges encountered by educators and learners during the instructional and educational process. Furthermore, the objective is to ascertain appropriate e-module development materials and information for incorporation into e-modules, and afterwards generate instructor and student-friendly e-modules as potential solutions. Hence, the researcher's investigation revealed that there is currently no precise learning e-module available for the Fabrication of Piping, Tubing, and Metal course. Furthermore, the study also identified the specific development materials employed for the creation of e-module, namely the flipbook and Canva software. Furthermore, the researcher has determined that the content to be created for this electronic module is grounded on the learning style known as VAK.

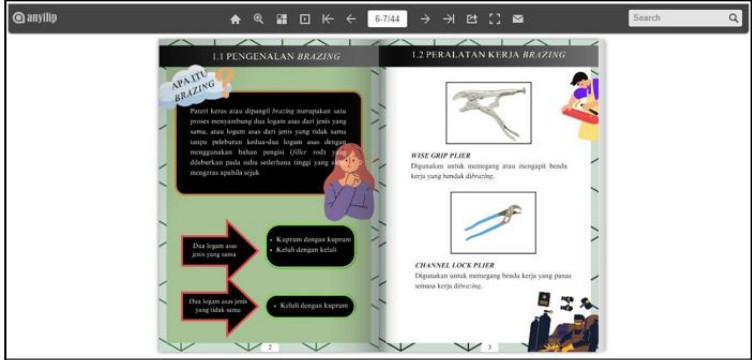
### **ii. Design**

During this stage, the researcher integrates the gathered information, data and concepts from the analysis phase in order to develop a high-quality and engaging electronic module for learning purposes. In order to create an effective e-module, it is necessary to ensure that the

design incorporates text, graphics, and video elements that align with the VAK learning style. This learning strategy serves as the foundation for the development of the e-module. Subsequently, the researcher proceeded to formulate the e-module design by utilizing the storyboarding technique and employing Canva software, as informed by the analysis conducted.

The design of e-module encompasses several elements, including textual content, graphics and video components, which will be presented in a structured manner resembling a storyboard. The purpose of this endeavor is to provide a comprehensive understanding to the researcher in the creation of this electronic module, while also streamlining the development procedure of this educational electronic module. Storyboards serve as a form of documentation utilized in the production of interactive multimedia. The document has programming instructions, audio scripts, and comprehensive depictions of visual components, including text, video, graphics, and animation. Consequently, the researcher formulated a development plan grounded in the conducted analysis and employed suitable methodologies to generate an electronic module capable of attaining the aims and addressing the study inquiries.

The VAK learning style paradigm comprises three fundamental components, namely visual, auditory, and kinesthetic. Based on this particular learning style, it is posited that students acquire knowledge and skills through three distinct modes of learning. In educational settings, it is observed that students often employ visual aids such as illustrations or pictures to enhance their understanding and communication of concepts. Auditory learners, characterized by their preference for acquiring knowledge through auditory stimuli such as listening to explanations or engaging in dialogues, as well as kinesthetic learners, who have a propensity for practical learning, are two distinct types of pupils. The implementation details of each element are depicted in Figure 2.

No.	Design	Display and Description
1.	Visual Elements	 <p>Visual learners prefer visual learning tools. Visual learners enjoy visual learning. This class learns fast. Students can visually display and preserve information. This e-module offers visuals and intriguing writing to illustrate each explanation. Visual learners understand better. They like painting, sketching, manipulating images, building, and assembling. They can read, write, solve puzzles, and comprehend charts and graphs.</p>


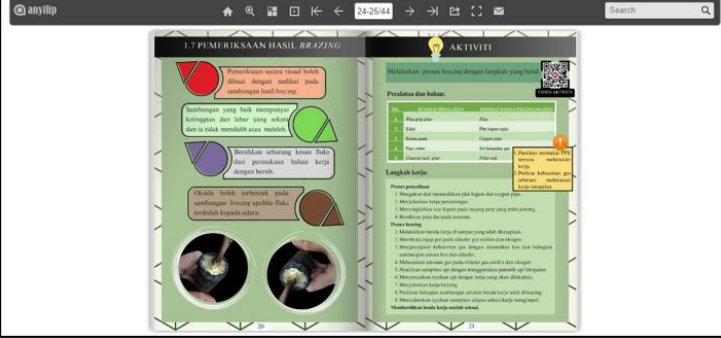
2.	Auditory Elements	 <p>Listening helps us comprehend what others say. Storytelling, education, comedy, and remembering can help these students. Thus, this e-module has an activity video for each topic. Students can read or listen to this video. The e-module has been designed based on the VAK learning method, which incorporates visual and aural components included in the produced activity videos. Given the circumstances, it is evident that this electronic module aligns with the preferred learning style of the intended audience.</p>
3.	Kinesthetics' Elements	 <p>The e-module has been designed based on the VAK learning style, incorporating a range of activities and instructions for students to engage with following the acquisition of theoretical knowledge. Students that possess a kinesthetics learning style typically demonstrate a proclivity for acquiring knowledge through experiential or practical means. Given the aforementioned circumstances, it is evident that this electronic module aligns with the kinesthetics learning style, since the researcher incorporates many activities for students to engage in.</p>

Figure 2: Design Criteria Development

### iii. Development

Once the e-module completes the design phase, the subsequent phase of development must be executed in accordance with the plans set during the design phase. The utilization of the specified elements and media technologies from the analysis and design phase will be employed by the researcher to develop a high-quality e-module for learning purposes. This e-module will be grounded in the theory of visual, aural, and kinesthetic learning styles. The production phase of this e-module encompasses several aspects, including text, pictures, video, and audio, which have the potential to captivate students' attention.



The e-module was developed by the researcher through the utilization of various software tools. Canva was employed for incorporating text elements and graphics into the e-module, while Capcut software was utilized to create video activities based on the pre-determined storyboard. This approach was adopted in order to align with the VAK learning style and facilitate the development of the e-module. Furthermore, the production of a video entails a series of steps, including the capturing and editing of the footage, as well as the development of an appropriate script to be incorporated into this educational e-module. Upon completion of the development of the e-module, it will be integrated into the flipbook software, hence enabling seamless utilization of the e-module.

#### **iv. Implementation**

After the development of the e-module, the researcher will proceed to implement it in authentic settings and evaluate the usefulness of the learning e-module. The e-module will undergo an evaluation procedure, wherein three respondents will be interviewed to identify and address the shortcomings identified during the development phase. This method aims to improve the e-module. Subsequently, the researcher solicited input from the participants pertaining to the design and usability of the electronic module in effectively attaining the study's objectives, employing interviews as the chosen method of data collection. The researcher is required to gather input from respondents in order to conduct an evaluation of the generated e-module.

#### **v. Evaluation**

The researcher conducts an evaluation process to determine whether the usability of the generated e-module aligns with the objectives of the study, or conversely. The evaluation step involves the analysis of data collected from interviews in order to obtain insights into the development of the e-module, its ability to address the identified challenges, and its relevance to the study topics. If necessary, enhancements will be implemented prior to proceeding to the subsequent phase in order to effectively address any problems or issues that may develop. During the concluding phase, the data is subjected to analysis through interviews performed to assess the usefulness of the developed e-module, as well as to establish the extent to which the study's objectives have been met (Gholami & Bagheri, 2013).

The researcher utilized a product design in this study, employing semi-structured interview evaluations as research instruments to gather feedback from participants regarding the usability of the product. Subsequently, the collected data was quantified to determine the coefficient of agreement using the Cohen Kappa Index. The primary objective of the instrument supplied is to evaluate the degree of usability exhibited by the product. The semi-structured interview been done with three instructors specializing in refrigeration and air conditioning. The study involved a single interview session with participants, focusing on their perceptions of the functional capabilities of the e-module, as the research instrument separation in Table 1.

Section	Construct	No. of Questions
Item A	Respondent information	4
Item B	Content Quality	2
Item C	Potential usability	3
Item D	Overall satisfaction	1
Item E	Suggestion and improvement	1

Table 1: The Division of Items in Semi-Structured Interview

Two questionnaire experts will assess the semi-structured interview questions before questioning individuals. These questions are categorized intentionally. Open and closed questions require basic answers. The code will choose the conclusion from each question's topic. Finding this code yields frequency numbers. Semi-structured dialogues will determine product usefulness. Item A, B, C, D and E were the discussion questions for this study. Item A asks about the respondent's background and other pertinent information. Item B covers product benefits and use. Potential usability is on item C and overall satisfaction as item D. Then, item E seeks product suggestion and improvement.

Robinson (2014) suggests picking research subjects based on their willingness to participate. The participants in this study comprise teaching staff members who are responsible for instructing students enrolled in the Refrigeration and Air Conditioning Technology program at Vocational Colleges. The participants for this study were chosen based on shared characteristics in their utilization of the produced e-module. The participants of this study were selected from a Vocational College, namely three instructors specializing in refrigeration and air conditioning. These instructors were chosen to utilize the newly built teaching and learning e-module.

Thematic analysis can encompass multiple perspectives and is beneficial for novice researchers, according to Braun & Clarke (2006). Thematic analysis uses recorded interview data to identify themes. The system's main, unaltered data will come from selected users. The researcher recorded, collected, analyzed, and interpreted the interview data for this study. The researcher analyzes interview transcripts to evaluate terms, identify key data, and organize it. Data was coded using predetermined criteria. The analysis excluded irrelevant data. The Cohen Kappa index acceptance evaluation scale ensured that semi-structured interview answers were analyzed into appropriate themes and codes. This simplified product usability evaluation. Quantitative data from four semi-structured interviews was converted into tables and descriptions. These tables and explanations showed objects, percentages, and frequency.

## Results and Discussions

Thematic analysis was employed to identify several aspects that could be inferred from the transcript of the interview. Each participant underwent an interview in which they were queried about their personal information, encompassing their name, age, place of origin, and educational attainment. The objective of this investigation is to enhance the researcher's comprehension of the individuals who were questioned. The responses made by each participant, based on the quality of their substance, are exemplified in the following interview question:

'In my view, the developed module does achieve the objective developed by the researcher.' (Sample 1)

‘In my opinion the module developed by this student achieves the objective which can complete the teaching session at the vocational college.’ (Sample 2)

‘The module developed by this student can complete the teaching session at the vocational college because this module is very helpful for the teaching staff.’ (Sample 2)

The coding process will be conducted by the researcher, who will determine the necessary coding criteria depending on the specific objectives of the study. The researcher generated a maximum number of codes in accordance with the recommendations of Braun and Clarke (2006). Consequently, the researcher derived a total of 30 codes from the data obtained through interviews. In the initial step, definitions are established for each code, followed by a subsequent stage where all codes undergo refinement. Table 2 presents the initial codes generated:

No.	Initial Code	No.	Initial Code
1	Achieve the objective	16	Interest
2	Complete the teaching session	17	Has a lot of information
3	Helping the teaching staff	18	Improve understanding
4	Easy to understand	19	Provide QR code
5	Total touching	20	Providing videos is very appropriate
6	Covers the entire content	21	Meet the characteristics that are appropriate for learning
7	Very organized	22	Includes Visual, Auditory, Kinesthetics teaching models
8	Very appropriate	23	Content that is relevant
9	Concise	24	Very appropriate
10	This module is interesting	25	Video preparation
11	Not boring.	26	Apply various teaching techniques
12	Not confusing.	27	Satisfied
13	Graphically shaped	28	Very effective
14	The best module	29	The usability of the module is very good
15	Infographic form	30	Neat writing

Table 2: Initial Coding of Interview Data

The process of re-examining themes was conducted using a two-tiered review approach, wherein sub-themes were carefully scrutinized and codes were derived from the interview data. During the initial phase, an evaluation was conducted to determine the extent of the interrelation between each code inside the sub-theme. The code will be excluded if it lacks compatibility with the sub theme. Consequently, at this juncture, several codes are excluded and consolidated into a singular code within a unified subtheme. The initial code generated during the coding process is decreased by two codes, resulting in a reduction from 30 codes to 28 codes. Table 3 presents the codes organized according to sub-themes:

No.	Sub Themes Developed	Number Code Arranged in Theme
1	The objective of the e-module	3
2	The content of the e-module	10
3	Presentation of e-module	8
4	E-module evaluation	6
5	E-module satisfaction	1
<b>Total</b>		<b>28</b>

Table 3: Number of In-Sub Themes

The themes and features identified from the interviews will be validated by the researcher through the utilization of the Cohen Kappa method. This approach entails evaluating the level of agreement between two assessors or coders when assigning ratings to categorical variables. Interrater reliability pertains to the extent of concordance among two or more observers or raters in giving identical ratings or categories to an observation or textual piece. This finding underscores the importance of raters sharing a common perspective and engaging in comparable research practices in order to enhance the trustworthiness of results.

The presence of high reliability in a study suggests that efforts have been made to eliminate individual bias, hence increasing the likelihood that other researchers, employing the same categories, will arrive at similar conclusions when analyzing the data. This inquiry examines the concept of qualitative validity and the strategies employed to ascertain the precision and dependability of interview data. The incorporation of the Cohen Kappa technique and the notion of interrater reliability contributes to the scholarly nature of the research study, augmenting the robustness of the findings and the validity of the conclusions derived from the collected data. The Cohen's Kappa calculation procedure was utilized to determine the level of agreement between the two assessors in analyzing the interview data. The results indicate a substantial agreement value of 88%. A specific illustration of the Cohen's Kappa computation is provided in Table 4.

Type of data	Researcher	Interrater 1	Interrater 2	Coefficient of agreement	Cohen Kappa
Interview	$\frac{28 - 14}{28 - 14}$	$\frac{26 - 14}{28 - 14}$	$\frac{25 - 14}{28 - 14}$	$\frac{1.0 + 0.86 + 0.78}{3}$	0.88
	$K = 1.00$	$K = 0.86$	$K = 0.78$	$= 0.88$	

Table 4: Calculation of Cohens Kappa

The Cohen Kappa agreement scale, as proposed by Cohen (1960) and further supported by Ghazali, Johare & Masrek (2011), is presented in table 5. In this scale, agreement values of 81% and 100% are considered high and indicative of very good agreement. Agreement values ranging from 61% to 80% are classified as good, while values between 41% and 60% are considered moderate. Agreement values falling within the range of 21% to 40% are categorized as weak, and values ranging from 0% to 20% are considered very weak. The proportion of scores achieved for the collected interview data is 88%. Hence, it can be inferred that the degree of consensus on the utility of the Join Metal by Brazing and Riveting e-module topic in Fabrication of Piping, Tubing and Metal course is quite favorable.

Score	Interpretation
0.81-1.00	Very good
0.61-0.80	Good
0.41-0.60	Moderate
0.21-0.40	Weak
0-0.20	Very weak

Table 5: Kappa Coefficient Value

The e-module for the subjects of Join Metal by Brazing and Riveting in the context of Refrigeration and Air Conditioning Technology, catered towards students enrolled in Vocational Colleges, has been developed with consideration for the VAK learning style. This module integrates various sensory modalities, including visual, auditory, and kinesthetic elements, to offer a comprehensive learning experience tailored to individual students' preferences. Visual components, such as images and video demonstrations, are incorporated, along with auditory elements like audio recordings and expert interviews. The VAK learning style hypothesis classifies persons into three categories: visual, auditory, or kinesthetic learners. This theory proposes that individuals possess preferences for obtaining information through visual stimuli, aural cues, or hands-on experiences (Litta & Budiarty, 2020).

Additionally, kinesthetic aspects were addressed through interactive simulations, practical activities, and project assignments that involve hands-on practice of brazing and riveting techniques. The objective is to provide a well-rounded educational encounter that accommodates diverse learning styles. VAK learning style approach encompasses several key steps, including an initial needs analysis, the development of content utilizing visual elements such as pictures and videos, the integration of auditory components such as audio narration and interviews, and the inclusion of kinesthetic elements such as interactive simulations and practical activities. Additionally, the e-module will feature assessments and project tasks to further enhance the learning experience. The technique emphasizes the integration of these aspects in order to facilitate complete and interactive learning, taking into consideration the individual student's preferred learning styles (Guo et al., 2020).

The assessment of the usability of the e-module is a crucial component of this research. The usability of the constructed learning e-module was assessed by the researcher in order to determine its effectiveness for vocational college students specializing in refrigeration and air conditioning. The objective was to evaluate the extent to which these students may benefit from utilizing the e-module as a learning tool. The evaluation of the necessity and significance of creating instructional aids and building teaching modules is conducted based on the usability and comprehensibility of the module by stakeholders engaged in teaching and learning activities (Nashir, Zainal, & Sulaiman, 2022). The e-module is distributed to vocational college instructors specializing in teaching courses on Fabrication of Piping, Tubing, and Metal. Its purpose is to gather comments and suggestions for enhancing the generated e-module through the utilization of the interview approach. According to Kamal, Jajuli, and Nafiah (2023), there is a need for enhancements in the delivery of content in order to increase its level of engagement.

This study primarily examines the usability of the e-module, with a particular emphasis on the agreement among respondents. The findings indicate a high degree of usefulness for the e-module. The researcher selected three participants who are educators specializing in the subjects covered by the e-module. These individuals were chosen to provide insights into the

development of the e-module through the means of interviews. Following the conclusion of the interview session, the researcher employed the thematic analysis method to extract significant information from the interview transcripts generated by the researcher. Through the application of thematic analysis, the investigator identified a number of sub-themes that facilitated the exploration of the third research inquiry (Byrne, 2022). Based on the sub-themes identified, the researcher can derive insights on the usability of the e-module in relation to its content, presentation, evaluation, as well as the level of user satisfaction with the generated e-module, along with recommendations for enhancing its effectiveness.

All participants provided affirmative responses and reached a consensus that the produced electronic module is characterized by user-friendliness and usability. Numerous research has indicated that the utilization of multimedia can provide beneficial outcomes in the context of pedagogy and professional development. According to Al Hashimi et al., (2019), the strategic utilization of media can enhance the pace and efficacy of learning, hence facilitating the successful attainment of learning goals. Furthermore, the analysis conducted on the usability component of this e-module unequivocally demonstrates its exceptional usability and its effective contribution towards assisting teachers in the teaching and learning process for the Fabrication of Piping, Tubing, and Metal course. The findings of Rashid & Bakar (2023) indicate that the utilization of teaching aids has resulted in a favorable perception among the participants, suggesting that its implementation has the potential to enhance the engagement and appeal of teaching and learning endeavors. The consideration of usability is crucial in maintaining the ongoing efficacy and pertinence of this electronic module designed for educators in Vocational Colleges.

## **Conclusion**

Based on the preceding discourse, it can be inferred that the e-module produced by the researcher has effectively tackled the research inquiries posited as the research objective. The individual who participated in the study as a respondent is an instructor who specializes in the subject matter being taught. They show a willingness to collaborate and offered insightful comments to the researcher. The e-module was subjected to an evaluation by the researcher, which yielded a positive overall assessment. The feedback received highlighted the e-module's usability, encompassing several factors such as its format, content, visuals and design. The utilization of the ADDIE model proved advantageous for the researcher during the developmental phase of this instructional e-module, which serves as a comprehensive guide and reference, enhancing its efficacy as a significant educational resource in the teaching and learning process. The data indicates a significant level of consensus among respondents, suggesting that the usability of this e-module effectively supports teaching and learning in the Refrigeration and Air Conditioning program for both teachers and students. In conclusion, the results of the analysis and assessment undertaken indicate that the constructed educational electronic module effectively achieves its intended goals and has garnered favorable responses from the participants.

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