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Development of Task-Based Instructional E-Module for Data Processing Unit of Information Technology Courses

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Abstract: Information technology has become a necessary skill for work, and it is a compulsory public course for students at Zhumadian Vocational and Technical College, where data processing is one of the learning units. Teaching methods and materials are crucial to improve the learning effect in information technology courses, and task-based teaching is being promoted by more and more educators as a teaching method that can effectively improve the teaching effect in information technology courses in higher education institutions. This research work attempts to develop a task-driven instructional e-module for students at Zhumadian Vocational and Technical College and to test its functionality and usability. The research selects 5 experts and 22 lecturers of information technology courses for the samples. The experts fill in an expert evaluation form to assess the E-module's functionality, while the lecturers fill in a questionnaire form to evaluate its usability, and three experts ensure the validity of the expert evaluation form and the questionnaire. The SPSS 26.0 is used for data analysis to evaluate the e-module. The results of this research showed that five experts considered the e-module to be highly functionality in terms of format, content, language, media display, and interactivity. The 22 lecturers who participated in the questionnaire also agreed that the e-module had a high level of usability in terms of usability, ease of use, attractiveness, and clarity. Meanwhile, experts and lecturers agree that students at Zhumadian Vocational and Technical College can use task-based teaching to improve Their study of data processing modules in information technology courses. It is hoped that this research can provide some useful reference for further promoting the teaching reform of information technology major in higher vocational colleges.

Keywords: E-module, task-based instructional, data processing unit

1. Introduction

According to China's Department of Vocational Education and Adult Education of the Ministry of Education, China has built the largest vocational education system in the world, with 11.200 vocational schools with more than 29.15 million students. Li et al. (2021) and others pointed out that since 2020, when the Covid-19 pandemic spread all over the world, its spreading speed and scope were beyond people's imagination. According to China's Ministry of Education, the number of college students affected by the epidemic situation in Covid-19 was 17.75 million. The epidemic not only

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brought about an increase in the demand for higher education but also brought about the industrial upgrading of related industries and at the same time triggered a change in the learning style of higher education. The traditional education mode is limited by time and space, making it difficult to achieve teaching goals. However, with the support of information technology (IT), the realization of teaching objectives, the completion of teaching plans, and the implementation of teaching tasks all depend on the internet (Zhu & Lou, 2022). During the epidemic, the extension of higher education was greatly extended by the application of the internet.

With this background, information technology should be put to good use and combined with appropriate teaching methods to expand the learning opportunities of vocational college students; provide efficient and high-quality teaching methods, teaching resources, and learning environment; meet individual employment needs and objective needs of jobs; and promote the development of social productive forces and accelerate the adjustment and transformation of the national industrial structure (Kadiyala & Crynes, 2000).

Educators and experts have developed many teaching methods of vocational education, including the role-playing method, the case teaching method, the project teaching method, the task-based teaching method, the interest group teaching method, the simulation teaching method, and so on (Toner, 2010). The research work of Wu et al. (2022) showed that task-based teaching is suitable for information technology courses, whether in basic education, vocational education, or higher education. Because each teacher and student have different thoughts, temperament, knowledge structure, aesthetic taste, and teaching (or learning) ability, aiming at different teaching materials, developing appropriate learning materials that are easy to learn and evaluate (Chan & Ellliott, 2004). In addition to choosing appropriate teaching methods, is also an important strategy to improve the learning effect (Sholawati et al., 2022). One of the learning materials considered to be high in quality and effective is the use of learning modules characterized by self-research, which can be used to give students the opportunity to choose their own learning strategies.

With the progress of technology, learning modules now rely more on information technology, such as websites, e-books, interactive whiteboards, etc. Among them, e-modules (electronic modules) have been used as teaching materials by more and more educators because of their interactive, interesting, and easy-to-evaluate characteristics (Rahmawati et al., 2019).

This research work explored the use of the task-driven teaching method to design an e-module for the data processing unit of information technology courses, the curriculum of which is difficult for students to understand, to facilitate students' self-research and improve their learning effect.

Before this project commenced, preliminary research work was conducted on the information technology curriculum at Zhumadian Vocational and Technical College. The topic was "Necessity of Data Processing Unit's E-Module Development for Information Technology Courses". By collecting and analysing the data from questionnaire forms distributed to 22 lecturers of information technology courses at Zhumadian Vocational and Technical College, the existing problems faced by students in the data processing unit, the importance of the data processing unit, and the feasibility of the E-module were determined.

In practice, problems need to be discussed in depth, such as how a suitable learning module can be developed, what better strategies and methods are for the task design, how the design can be more scientific, and how students' learning ability and academic achievement can be scientifically assessed and evaluated. There have been no scientific and rigorous experimental research works on the improvement of teaching effect and the promotion of students' development by task-based teaching. Teachers lack specific guidance on systematic training and teaching methods, and most teachers need to constantly update and improve their educational ideas and concepts (Van Leeuwen & Janssen, 2019). Hence, this topic was put forward to research the influence of a task-driven e-module on the teaching of information technology courses at Zhumadian Vocational and Technical College, with the hope of exploring a teaching method suitable for information technology courses in local vocational colleges.

From the discussion on the background of the problem and the review of previous researchers, it can be concluded that teaching methods and the design of teaching materials are important factors that affect students' mastery and understanding of learning topics. In addition, the use of an e-module also helps to improve students' interest in learning, their ability of autonomous learning and problem solving, and their learning effect (Jaenudin & Murwaningsih, 2017). If the teaching content is dull and the teaching form is stagnant, students will feel bored in class. Previous researchers have found that data processing, as a teaching unit of information technology, has some incomprehensible problems. In the National Computer Rank Examination (NCRE), data processing shows the lowest score. Students' mastery of data processing unit still needs to be improved, and there is still no task-driven learning module in information technology courses at Zhumadian Vocational and Technical College. This research sought to develop a task-driven learning e-module, which can be more interesting and flexible than traditional learning materials. This interactive e-module contains three knowledge points and six learning tasks. Each task uses the task-driven instructional design, which can help teachers in the teaching process and attract students to learn independently. It is hoped that this task-based instructional e-module can improve students' understanding, skills, and achievements and have a positive impact on the education system, so as to cultivate skilled and competitive students for the country in the 21st century.

According to the new curriculum standard and students' characteristics, this paper aimed to develop a task -driven interactive e-module for the information technology courses at Zhumadian Vocational and Technical College to cultivate

students' interest in learning, improve students' autonomous learning and problem-solving ability, and improve their academic performance. This research had three research objectives: a) develop a task-based instructional e-module for the data processing course; b) test the functionality of the task-based instructional e-module for the data processing course; and c) evaluate the usability of the task-based instructional e-module for the data processing course.

2. Literature Review

As an important factor in the development of modern science and technology, information technology has gradually penetrated all walks of life, quietly changing the social structure, changing people's production and lifestyle, and showing unprecedented ability to promote and subvert the development and progress of human society (Ministry of Education, 2021). It covers various aspects, such as information acquisition, representation, transmission, storage, processing, and application.

Information technology has become the main driving force of economic and social transformation and development and is the basic support for building an innovative digital China with manufacturing and network power and a smart society (Hilbert, 2022). Improving the national information literacy and enhancing the adaptability and creativity of individuals in the information society are of great significance to their life, research, and work and to building a modern socialist country in an all-round way (Ministry of Education, 2020). For example, Taobao and JD.com, China's familiar online shopping platforms, have innovated new sales models. Information technology products, such as quantum satellites and bullet trains, have greatly improved the mobility of information and people in society, changed social productivity, and promoted social development and progress.

Students in vocational education are younger, and hence their intelligence is in the process of growth and their analysis of things is not thorough. The teaching content of the data processing unit is boring, and students will be uninterested in class if teachers do not use appropriate teaching forms (Shuju & Shijun, 2022). Due to the practicality of information technology courses, the learning effect of students' independent attempts to operate and construct knowledge system will be much better compared with teachers' direct demonstration of complete tasks completion. Therefore, in the teaching of information technology courses, to adapt to the changes of new curriculum standards and training objectives and improve students' information literacy, teachers need to guide students in researching actively and discovering the wonders of knowledge, construct an information technology knowledge system, and give full play to students' enthusiasm and creativity (Gunter, 2001).

Previous researchers have found that data processing, as a teaching unit of information technology, has some incomprehensible problems (Chen et al., 2022). According to Yu and Iwashita (2021) from the data released by the organizer of the National Computer Grade Examination (NCGE), the module with the lowest score rate in this examination was data processing. Under the new environment, the spreadsheet module has added the average and sum functions of multiple conditions, and many sets of questions involve multiple IF and VLOOKUP functions; so, many students had no way to start for the following operations, such as charts and screening (Li et al., 2020). For example, VLOOKUP requires that the search value must be the same as the data in the search area and that there must be no spaces, not to mention the format difference between them. Otherwise, the module looks very similar, but there will still be a Not available error (Yin, 2016). As a result, 68% of the students scored 0 in the spreadsheet part and, furthermore, the difficulty of the spreadsheet module generally increased (Chen et al., 2022).

Having an indispensable role in the modernization of education, information technology courses is a hot subject in the discussion of education and teaching at present. The curriculum standards for Chinese and other subjects in compulsory education 2011 edition requires teachers to create realistic, vivid, and concrete situations, and let students experience and understand knowledge based on existing knowledge. The "Information Technology Curriculum Standards for Senior High Schools (2017 edition, 2020 revision)" guideline advocates diversified teaching strategies, point ting out that information technology learning is not only regarding the intake of knowledge itself but also the way and means for students to know, understand, and transform the world. Students should be trained to solve problems flexibly in different situations, and their awareness of opening, cooperation, consultation, and evidence-oriented actions should be stimulated, so that they can actively participate in interactive and authentic learning activities supported by information technology (Herrington & Kervin, 2007). Liu's (2016) research work pointed out that data processing has a certain complexity, and in the teaching process, the traditional teaching methods and teaching materials have been unable to meet the needs of students to learn the knowledge.

At present, the research on task-based instructional e-modules in China is maturing, and there have been preliminary application research works on information technology teaching. Some teachers do not fully understand the connotation of the relevant theoretical concepts of task-driving teaching, and it is not well integrated into specific teaching designs and implementation, let alone skillfully applying task-driving teaching in emerging information technology disciplines (Kumar et al., 2017; Erdogan et al., 2010; Dede, 2000; Visscher, 1996). In the epidemic era, students and schools are faced with a long-term suspension of classes and with online teaching. With task-based teaching, developing learning modules suitable for students can provide convenient and interesting learning materials for students' self-research, which is conducive to improving students' initiative and enthusiasm and improving teaching quality (Yang et al., 2021). The development of learning modules should follow the requirements of five aspects under certain preset conditions: fully embodying the core quality of the subject, having clear teaching objectives, designing a well-structured evaluation

scheme, creating learning modules in a gradient way, and selecting teaching materials pertinently. Combined with the overall context of instructional design, a consistent and unified classroom implementation development and evaluation model can be set up, with a certain hierarchical relationship among the contents. Teaching objectives, evaluation schemes, learning modules, and teaching materials can be designed around and embody core literacy, and the hierarchical relationship is gradually reduced (Seechaliao et al., 2012).

3. Methodology

The research method is an important part of this research work and refers to the systematic steps, processes, techniques, ways of planning or exploring, strategies of collecting data or analyzing evidence, etc., of developing the e-module of the task-driven instructional design, so as to discover new information or better understand a topic. This research used the quantitative research method to collect data.

The design of a research is a specific technique or method for obtaining the information needed to solve a problem. The design mainly includes the overall goal and method, the type of research design, the sampling method or standard of subjects, the data collection method, the data collection process, and the data analysis method. A well-planned research design helps to ensure that the methods match the research objectives and that the correct analysis methods are used for the data. In this research, the research design of this product was to develop an e-module of the task-driven instructional design for the data processing unit of information technology courses.

The research used the quantitative method to investigate the responses from the experts and lecturers at Zhumadian Vocational and Technical College who evaluated the functionality and usability of the developed task-driven instructional e-module. A quantitative method provides effective and reliable survey results to achieve the research objectives and answer the research questions that have been put forward. In this research, before the e-module development process was implemented, the choice of the instructional design model was first determined so that the development of the e-module can proceed smoothly as planned (Lakshman et al., 2000). In the process of designing the e-module, it was very important to refer to past researchers related to the research topic.

In the implementation of the product development and design research, the ADDIE model was selected as the guide in the development process. The use of this model was a suitable choice for the development and design of the e-module because it has five stages, namely systematic and structured analysis, design, development, implementation, and evaluation (Najuah et al., 2021). According to the data, researchers in the past also chose the ADDIE model because the steps of making e-modules are orderly and every stage involved is more systematic, hence making it easier in this research to develop an e-module based on this model.

Although there are five stages in the ADDIE model, this research only used three stages modified from the ADDIE model, namely analysis, design, and development. The implementation and evaluation stages are beyond the scope of this research. The scientific design is the premise to ensure the maximum teaching effect. As a scientific, effective, and general instructional design model, the ADDIE model has strong operability (Valverde-Berrocoso & Fernández-Sánchez, 2020). Based on the modified ADDIE model, this research work constructed the development process of the e-module for the data processing unit in information technology courses at Zhumadian Vocational and Technical College, and the links in the design and development of the e-module is discussed.

The research used an evaluation form and a questionnaire as research instruments to evaluate the functionality and usability of the e-module. The evaluation form and the questionnaire were utilized to examine the design steps, the interface, and the interaction level of the e-module. The research instruments were examined by three experts to confirm that they were in line with ethics and the research content.

The expert evaluation form is based on the design of Hamid et al. (2020). The expert evaluation form was designed into two parts: A and B. Part A contained demographic data of gender, research field, and research experience (in years). Part B comprised four topics, namely format, content, language, and media, and contained assessments related to the functionality of the developed e-module. Each item was assessed on Likert scales: strongly disagree, disagree, agree and strongly agree. The experts only needed to fill out the evaluation form to indicate their responses to the statements. The assessment was carried out from the submitted feedback. Part B also contained a suggestion section so that the experts can offer suggestions for each statement.

The questionnaire referenced the design of Fahlevi et al. (2021). The questionnaire was designed into two parts: A and B. Part A contained the demographics of gender, level of education, and duration of teaching (in years). Part B comprised four themes, namely usability, ease of use, attractiveness, and clarity, which provided the evaluations related to the usability of the developed e-module. Each was evaluated according to five Likert scales: strongly disagree, disagree, agree, marginally agree, and strongly agree. The respondents only needed to fill out the questionnaire form to show their responses to the statements. The evaluation was conducted from the submitted feedback. Fig. 1 ilustrated the development process based on the ADDIE model design implemented in the whole development process of the e-module.

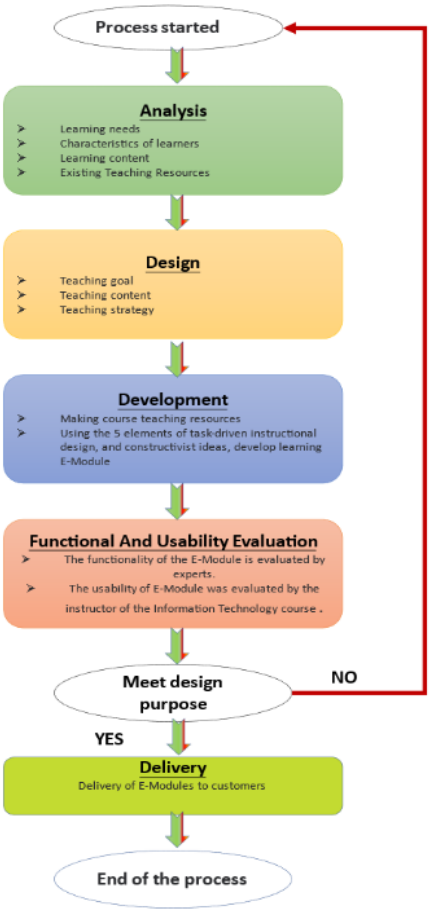

Fig. 1: Design framework of task-driven instructional e-module

4. Results

This part describes the analysis of data results used to evaluate the functionality and usability of task-driven instructional design e-module. This chapter analyzes the results of functional and usability evaluation of e-module. The evaluation table is used for functional evaluation, and the collected data results include part A, namely demographics, and part B, namely format, content, language, media display, interactivity. The data results used for usability evaluation include part A, which is the demographic data of respondents, and part B, which is usability, ease of use, attractiveness and clarity.

The data obtained by researchers are analyzed and displayed in the form of numbers and percentages (%). The following is the data analysis result of user interviewees' evaluation of e-module functionality, covering format, content, language, media display, interactivity, etc.

Table 1 shows the analysis results received by five evaluation projects designed by e-module format. The data shows that a total of 4 (80%) experts strongly agree, and 1 (20%) agree with clarity of instructions for use, which can help experts use the website easily. Next, 5 (100%) experts strongly agree with the convenience of colors on module learning media. Finally, a total of 5 people (100%) strongly agreed with the convenience of text material on module learning media. This clearly showed that all respondents (100%) agreed that the developed e-module was highly functional in format.

Table 2 shows the analysis results received through four evaluation projects of e-module content design. According to the data, all five experts (100%) strongly agree that conformity of learning activities with e-module learning media on data processing can help experts understand its content easily. Next, all five experts (100%) strongly agree that clarity of animation in conveying the concept of data processing learning activities with e-module learning media. This clearly shows that all the respondents (100%) agree that the developed e-module is highly functional in content design.

Table 1: Frequency and percentage of experts' evaluation on e-module format design

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	Clarity of instructions for use	0	0	0	0	1	20	4	80
2	Content conformity on material	0	0	0	0	2	40	3	60
3	The suitability of colors on module learning media	0	0	0	0	0	0	5	100
4	The suitability of images on module learning media	0	0	0	0	1	20	4	80
5	The suitability of text material on module learning media	0	0	0	0	0	0	5	100
	Overall average	0	0	0	0	0.8	16	4.2	84

Table 2: Frequency and percentage of experts' evaluation on e-module content design

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	Conformity of learning activities with e-module learning media on data processing	0	0	0	0	0	0	5	100
2	Clarity of concepts of learning activities with e-module learning media on data processing	0	0	0	0	1	20	4	80
3	Conformity of animation in e-module learning media with the concept of data processing learning activities	0	0	0	0	2	40	3	60
4	Clarity of animation in conveying the concept of data processing learning activities with e-module learning media	0	0	0	0	0	0	5	100
	Overall average	0	0	0	0	0.8	15	4.2	85

Table 3 shows the analysis results received through five evaluation projects in e-module language. According to the data, five experts (100%) strongly agree with the effectiveness of the sentences used. In addition, four people (80%) strongly agree, and one person (20%) agrees with word usage in accordance with enhanced English spelling system. This clearly shows that all respondents (100%) agree that the developed e-module is highly functional in terms of language.

Table 3: Frequency and percentage of experts' evaluation of e-module language

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	The use of standard language	0	0	0	0	3	60	2	40
2	Ease of understanding the language used	0	0	0	0	2	40	3	60
3	The effectiveness of the sentences used	0	0	0	0	0	0	5	100
4	Complete sentences/information needed by students	0	0	0	0	1	20	4	80
5	Word usage in accordance with enhanced English spelling system	0	0	0	0	1	20	4	80
	Overall average	0	0	0	0	1.4	28	3.6	72

Table 4 shows the analysis results received through seven evaluation projects on e-module media. According to the data, five experts (100%) strongly agreed that the use of text in the e-module learning media is in accordance with the characteristics of students. In addition, a total of 4 people (80%) strongly agree, and 1 person (20%) agrees with the colors used in the e-module are portable for learning. Then, 4 people (80%) strongly agree, and 1 person (20%) agree with the images used in the e-module are portable for learning. This clearly shows that all respondents (100%) agree that the developed e-module is highly functional in media.

Table 4: Frequency and percentage of media evaluation of e-module by experts

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	Simple display of text on e-module learning media	0	0	0	0	3	60	2	40
2	The design of the e-module learning media display is easy to understand	0	0	0	0	2	40	3	60
3	The use of text in the e-module learning media is in accordance with the characteristics of students	0	0	0	0	0	0	5	100
4	The colors used in the e-module are suitable for learning used in the e-module	0	0	0	0	1	20	4	80
5	The images used in the e-module are suitable for learning used in the e-module	0	0	0	0	1	20	4	80
6	Neatness of e-module learning media	0	0	0	0	2	40	3	60
7	Suitable navigation button layout	0	0	0	0	2	40	3	60
	Overall average	0	0	0	0	1.6	31	3.4	69

Table 5 shows the analysis results received through four evaluation projects of e-module interactivity. According to the data, 3 experts (60%) strongly agree, and 2 experts (40%) agree with e-module website ease of use. Next, 3 experts (60%) strongly agree, and 2 experts (40%) agree with e-module website Use of navigation buttons. In addition, three experts (60%) strongly agree, and two experts (40%) agree with ease of operation. This clearly shows that all respondents (100%) agree that the developed e-module is highly functional in terms of interactivity.

Table 5: Frequency and percentage of experts' evaluation on interactivity design of e-module

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	Ease of use	0	0	0	0	2	40	3	60
2	Use of navigation buttons	0	0	0	0	2	40	3	60
3	Ease of operation	0	0	0	0	2	40	3	60
4	Operation of all components	0	0	0	0	3	60	2	40
	Overall average	0	0	0	0	2.3	45	2.7	55

The following is the data analysis result of user interviewees' evaluation of e-module usability, covering usability, ease of use, attractiveness, clarity and so on. Table 6 shows the analysis results of users' feedback on e-module usability. Evaluating the usability of the e-module interface design involves eight evaluation items. According to the data, the analysis shows that all respondents (100%) agree that the developed e-module has high usability in this respect.

Table 6: User evaluation frequency and percentage of developed e-module usability

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	Module can increase the independence of learners in learning	0	0	0	0	7	32	15	68
2	Module in being able to transfer knowledge well so that teaching materials are easily understood by learners	0	0	0	0	6	27	16	73
3	Module can help educators / teachers to deliver learning contents	0	0	0	0	6	27	16	73
4	Module developed can add insight to readers (educators and learners)	0	0	0	0	9	41	13	59
5	Module can help teachers motivate students in learning	0	0	0	0	7	32	15	68

Table 6: User evaluation frequency and percentage of developed e-module usability (Continued)

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
6	Module can help educators in encouraging learners' courage in achievement	0	0	0	0	4	18	18	82
7	Worksheets on module can direct learners on data processing activities	0	0	0	0	3	14	19	86
8	Evaluation questions mastery tests on module can train students' data processing operations	0	0	0	0	10	45	12	55
	Overall average	0	0	0	0	6.5	0	0	0

Table 7 shows the analysis results received through the user's feedback on the ease of use of e-module. Evaluating the usability of the e-module interface design involves 11 evaluation items. The data shows that a total of 21 respondents (95%) strongly agree, and one (5%) agrees with the use of module in the learning process can be effectively. Next, a total of 18 respondents (82%) strongly agree, four people (18%) agreed that the use of language on module is easy for learners to understand and modules are easy to carry because it fits into a small comparison. Overall, the analysis shows that all respondents (100%) agree that the developed e-module has general usability in this respect.

Table 7: User evaluation frequency and percentage of developed e-module ease of use

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	The use of module in the learning process can save time	0	0	0	0	8	36	14	64
2	The use of module in the learning process can be utilized effectively	0	0	0	0	1	5	21	95
3	The use of language on module is easy for learners to understand	0	0	0	0	4	18	18	82
4	The presentation of materials on module is clear	0	0	0	0	10	45	12	55
5	The presentation of materials on module is simple	0	0	0	0	13	59	9	41
6	The presentation of exercises on module is clear	0	0	0	0	7	32	15	68
7	The presentation of exercises on module is simple	0	0	0	0	13	59	9	41
8	The modules are practical because it can be stored	0	0	0	0	14	64	8	36
9	Modules are easy to carry because it fits into a small compartment	0	0	0	0	4	18	18	82
10	Module is practical to use repeatedly as needed	0	0	0	0	18	82	4	18
11	Module is easy to use repeatedly as needed	0	0	0	0	9	41	13	59
	Overall average	0	0	0	0	9.2	41	12.8	59

Table 8 shows the analysis results received through the user's feedback on the e-module attractiveness. Evaluating the usability of the e-module interface design involves six evaluation items. The data shows that a total of 22 respondents (100%) strongly agree with the appearance of the module is very attractive. Next, a total of 20 respondents (91%) strongly agree, 2 (8%) agree with the selection and color combination used in the module is fashionable. Overall, the analysis shows that all respondents (100%) agree that the developed e-module has high usability in this respect.

Table 8: User evaluation frequency and percentage of developed e-module attractiveness

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	The design of the module is eyes catching	0	0	0	0	14	64	8	36
2	The appearance of the module is very attractive	0	0	0	0	0	0	22	100
3	The description of the material on the module is equipped with appropriate images	0	0	0	0	5	23	17	77
4	The description of the material on the module is equipped with appropriate illustrations	0	0	0	0	5	23	17	77
5	The type of writing (font) on the module can be clearly read	0	0	0	0	16	73	6	27
6	The selection and color combination used in the Module is fascinating	0	0	0	0	2	9	20	91
	Overall average	0	0	0	0	7	32	15	68

Table 9 shows the analysis results received through the user's feedback on the interface design of the e-module. Evaluating the usability of the e-module interface design involves seven evaluation items. According to the data, a total of 21 people (95%) strongly agreed, and one person (5%) agreed to the font type on the e-module is clearly read. At last, the analysis shows that all respondents (100%) agree that the developed e-module has high usability in this respect.

Table 9: Frequency and percentage of user evaluation of developed e-module clarity

4 = Strongly agree 3 = Agree 2 = Disagree 1 = Strongly disagree		Disagree				Agree			
		VD (1)		D (2)		A (3)		VA (4)	
		No	%	No	%	No	%	No	%
1	The image displayed in the module is clear	0	0	0	0	3	14	19	86
2	The objectives to be achieved in the module are clear	0	0	0	0	8	36	14	64
3	The instructions for the use of module are clear	0	0	0	0	14	64	8	36
4	The font type on the e-module is clearly read	0	0	0	0	1	5	21	95
5	The description of the material on module is clearly presented	0	0	0	0	18	82	4	18
6	The activities on module are clearly presented	0	0	0	0	3	14	19	86
7	The worksheets on module are clearly presented	0	0	0	0	15	68	7	32
	Overall average	0	0	0	0	8.9	40	13.1	60

Table 10 shows the comparison percentage of overall functionality and usability between experts and users according to the aspects evaluated in this e-module. This percentage analysis shows that, in terms of functionality, experts give higher evaluation to format and content. In terms of usability, users have the same opinion on usability and attractiveness projects. Overall, the e-module shows high functionality and usability.

Table 10: Comparative percentage of all aspects evaluated

Project	Aspects of evaluation	Frequency and percentage			
		Agree		Strongly agree	
		No	%	No	%
Functionality	1 Format	0.8	16	4.2	84
	2 Content	0.8	16	4.2	84

Table 10: Comparative percentage of all aspects evaluated (Continued)

Project	Aspects of evaluation	Frequency and percentage			
		Agree		Strongly agree	
		No	%	No	%
	3 Language	1.4	28	3.6	72
	4 Media display	1.6	31	3.4	69
	5 Interactivity	2.3	45	2.7	55
Overall functionality		1.4	27	3.6	73
Usability	1 Usability	6.5	30	15.5	70
	2 Ease of use	9.2	41	12.8	59
	3 Attractiveness	7	32	15	68
	4 Clarity	8.9	40	13.1	60
Overall usability		7.9	36	14.1	64

5. Discussion

According to the above analysis, we can see the value of each component in the actual evaluation of e-module. The data shows that the e-module of task-driven instructional design has good usability. Based on these results, it can be concluded that it is feasible to use e-module for online learning. e-module are actually used because they can provide high feedback or interactivity between users and e-module. E-module can be used repeatedly. This accords with the characteristics of e-module as teaching materials and can replace the functions of teachers (Hamid et al., 2020).

According to the feedback from users on usability evaluation of e-module, the research results are highly consistent. Researchers have concluded that good usability is a very important standard in the development of e-module (Chen, 2014). E-modules designed for online learning are actually used because they can be adjusted according to learners' available time, thus saving time and being effectively used for learning (Seruni et al., 2020). E-module can help students match their learning speed with their learning ability. In addition, these e-module can be adjusted according to the learning speed of different students. It also conforms to one of the practical standards of e- module, that is, the ease of use in the learning process, which can be reused according to the learning speed of students.

6. Conclusion

According to the described discussion, in a word, the research results show that the developed e-module meets all the three research questions that have been set. Respondents composed of experts and users have also given good cooperation in providing necessary feedback. The whole evaluation provides positive feedback to the developed e-module from the aspects of functionality and usability. In addition, the choice of ADDIE development model is also regarded as a teaching aid that helps researchers in the process of developing e-module as one of the teaching media, and is also thematic, attractive and influential to users. e-module, as a whole, uses five task-driven steps in instructional design to make a complete learning topic. This self-study method is also considered to improve students' knowledge and skills of data processing units in information technology courses. This clearly shows that e-module not only benefit lecturers, but also have a positive impact on students' learning.

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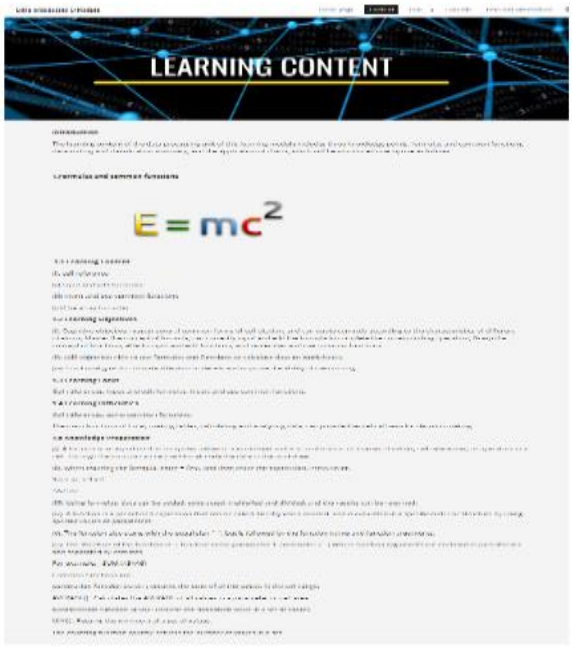
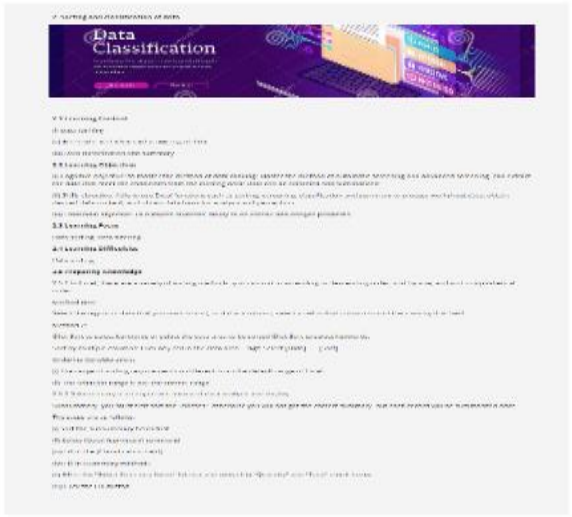
Appendix:

The following is an e-module figure of the developed task-based instructional design.





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