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Hyper content e-module in information behavior course with the assistant of screencast

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ABSTRACT

In the 21st century, continuous innovation and adaptation in every component of learning is required in education, both in the competency component, material content, strategy and media, as well as its evaluation. This study emphasized the development of an electronic or digital module in the information behavior course, it is one of the courses regarding the characteristics of the student activity level that accommodates information retrieval and strives to use appropriate information. The e-module design is developed utilize the 4D model by define, design, develop and disseminate. The participants of this research involved media experts, material experts and students of the Library and Information Science study program at two universities, which are are Universitas Pendidikan Indonesia and Universitas Negeri Malang, there are 20 people in total who used e-modules in limited dissemination on information behavior course. This research revealed the electronic module in the course, the emphasis of the module content design which is enriched with digital-based information sources or in another word called as hyper content that becomes a differentiator in presenting the module content, coupled with the power of audio and visual media or called as screencast. Through this research, lecturers able to prepare independent learning materials by utilizing digital technology.

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1. INTRODUCTION

The industrial revolution 4.0 has brought a series of changes in human life. At the same time, the industrial revolution 4.0 not only opens various opportunities for business actors, governments, and individuals, but also brings challenges to the widening of the gap between society groups. The World Economic Forum in Global Competitiveness Report 2018 states that there are ten conditions that must be met by a country to be able to transform and align itself with RI 4.0. Therefore, RI 4.0 it is said to be the integration of technology, innovation, and people, with massive advancements in production and data analytics technologies, with most of these advancements concentrated on AI techniques and digital manufacturing systems, converting systems to be intelligent and smart [1].

These requirements refer to one main factor, the innovation which is considered to be the booster of the country's transformation and development. Indonesia's competitiveness has only reached rank 45 out of 140 countries in the world (in 2018), with a value of 64.9, which rises up 1.4 points from 2017. Indonesia's superiority is in the breadth of market share (rank 8), culture entrepreneurship (rank 24), and business dynamics (rank 30). In fact, Indonesia is declared "one of the world's most connected emerging economies",

on a par with other developing countries. However, Indonesia's ability to innovate is still extremely weak, research and development have not been the focus of much of Indonesia's growth, and the quality of higher education is still far from expectations. This is mainly due to unequal enthusiasm and skills to innovate, thus universities cannot play a role as a center for scientific development and innovation to increase the nation's competitiveness [2].

Universities is directing innovate skills that are grown through innovative learning that is not always the same every time, not only looking for the right answer (and only one), not just memorize, but also learns very dynamic full of diversity, which uses a variety of media creative, challenges students to produce a variety of alternative problems solving, and challenges students to be tough. Innovative skills that have been mastered by students will be beneficial as useful skills for the rest of their lives. Learning paradigm currently has begun to transform from traditional to digital resources in higher education to prepare learners for twenty-first-century challenges. However, the potential of emerging technology to support learning remains a controversial issue. There are still some unclear issues such as benefits and challenges of digital-enhanced learning approach. Furthermore, it is also crucial to understand the impact of technology on students' interest in learning, collaborative learning with peers, and effectiveness of learning such as retention of knowledge [3].

In each of learning component, the demands for innovation always arise in changing the formulation of goals, content, learning strategies, media and evaluation. All of these learning components constitute one whole unit that is connected to each other [4]. One of the characteristics of 21st century learning is the use of varied learning media, online-based in a digital format [5]. Therefore, the process of digitizing, digitalization and digital transformation is absolutely necessary to respond the latest educational needs.

A systematically arranged material results the environment or atmosphere that allows students to learn, it is a description of the material concept. Module is a form of learning material that is currently being developed to meet the integration of learning outcomes competencies, and to facilitate the availability of learning materials that can be accessed independently and direct the learning with various sources. The digital module has the advantage of being able to present some materials using interactive learning media. Mataya adapts e-module which has nine characteristics: i) It can be used by users independently or self-instructional; ii) The content of the module includes all material or self-contained; iii) The modules is not depending on the other media or stand alone; iv) Can be adapted along with the development of knowledge and technology; v) It can be used by users easily or user friendly; vi) The layout of the modules is consistent (margins, space, fonts); vii) Can be used by electronic devices, both cellphones and computers; viii) Have the multimedia quality in nature, therefore it can take advantage of various types of other electronic media; ix) Take advantage of the features of software application, and carefully designed [6].

Modules are designed to be used independently, it is optimized especially by providing support to students through content enrichment or delivering the method of teaching material module [7]. Screencast technology has become more popular since digital media players reached the market in 2013. With screencast technology a user can send content from a phone (such as a YouTube or Netflix video you might be watching) to a TV. Moreover, screencast devices are simple to configure, portable (as they can be easily moved from one TV to another), and they are not expensive. Its key role as facilitator to access learning content is probably the most relevant advantage for students [8]. Screencast devices are simple to configure, portable (as they can be easily moved from one TV to another), and they are not expensive. Its key role as facilitator to access learning content is probably the most relevant advantage for students [8]. Some studies even state that the use of screencast is responded positively by students and tends to provide students with involvement, especially in distance learning [9]–[13]. In addition, screencasts can help students to develop their achievements, their skills in group relationships and help them learning to collaborate and to think critically and cooperatively [14].

It is expected that the insertion of screencast media can provide new dynamics, thus the developed electronic module can transform by having hyper content characteristics. Hyper content comes from the concept of hypertext, by changing the delivery pattern that tends to be linear to be dynamic. Teaching has largely been delivered verbally, in class, or through text-based content. Recently, a growing body of evidence has outlined the pedagogical benefits of delivering content using visual mediums. For Instance, such as Khan Academy, Udemy, Coursera and Skill Academy become common learning resource using visual media to deliver an education content. which can be accessed immediately when using the module [15]. Therefore, learners can freely choose to study certain parts of the material that are deemed necessary to be studied non-sequential and not the same as other students [16]. The use of the hyper content approach in the module can increase the motivation and enthusiasm of students in accessing the content of the material presented with a variety of visual, audio elements and a combination of both [15]–[18]. It is expected that the integration of the competencies of each student can be achieved through the development of a digital hyper content module with the assist of screencast media, accompanied by the development of the learning materials form in the Information Behavior course which is enriched with a variety of various sources and integrated media forms.

2. RESEARCH METHOD

This study uses a descriptive analytic approach in developing a form of learning product design. The location of this research is in the city of Bandung, Indonesia with research subjects 40 students of the Library and Information Science Study Program. This research was conducted to produce design guidelines for making digital modules with digital hyper content along with the assist of several applications, such as automatic screencast. The learning module development is carried out with the 4D model approach which consists of the stages: define, design, develop and disseminate [18], this 4D model aims at developing the product and adapting the use of these products. 4D method used in research is basically widely used for the development of instructional models and teaching materials [19]. The hyper-content module developed in the information behavior course is intended for students in library and information science study program.

3. RESULTS AND DISCUSSION

3.1. Results

The initial stage in the Four D (4D) analysis model is to determine the type of learning material to be developed, which is a digital module or e-module with content that adapts various forms of digital collections in explaining content, detecting the suitability of the module format which includes organization, attractiveness and font size which determined the results of the media expert's review, described as in Table 1.

Table 1. Analysis of media expert's assessment

No.	Aspect	Dimension	Assessment		
			Great	Good	Bad
1	Organization	Text legibility on the E-module	v	-	-
		Completeness of module parts	v	-	-
2	Attraction	Attractive appearance of the module content	v	-	-
		Attractive appearance of the questions	v	-	-
		Presentation of picture, illustration, and animation	-	v	-
3	Font and picture	Appropriateness of font colour and picture	-	v	-
		Appropriateness of font style and picture	-	v	-

The second stage determines the design of the module content, conforms the content to the standard e-module design or digital hyper content module with an emphasis on the screencast aspects under study (self instruction, self-contained, independent (stand-alone), adaptive, and user friendly) which are well-analyzed and had been designed by the research team. Referring to the third stage, which is the development stage by adding the need for the use of Screencasts to clarify the contents of textual learning materials, it is to provide an audiovisual link which is developed based on two principles of screen casting development: effective multimedia and effective learning [20], along with module content development, the analysis results are shown in Table 2.

Table 2. Analysis of material expert assessment

No.	Aspect	Dimension	Assessment		
			Great	Good	Bad
1	Self instruction	Clarity of learning objectives.	v	-	-
		Learning materials coverage.	v	-	-
		Learning materials are supported by examples and illustrations.	-	v	-
		Availability of questions and assignments to measure student mastery.	v	-	-
		The tasks and questions presented are relevant to the material, the context of activities and the environment of students.	v	-	-
		The use of simple and communicative language.	-	v	-
		Availability of a summary of learning materials.	v	-	-
		Availability of assessment instruments.	v	-	-
		Availability of feedback on student assessments.	v	-	-
2	Self contained	Contains all one standard competency learning materials or basic competence in its entirety.	v	-	-
3	Adaptive	The e-module adapts to technological developments.	v	-	-
4	User friendly	Instructions are easy to use	v	-	-
		Information is easy to understand	v	-	-

The fourth stage in the 4D model is a limited study of the use of modules, the aspects which under studied are (media suitability, material presentation, and e-module learning activities). The appearance level of e-learning module is adjusted to the media aspect and produces information in which these three aspects are great and can be accessed as independent learning materials in the Information Behavior course, the results of the analysis are illustrated in Table 3.

Table 3. Digital module

No	Aspect	Dimension	Assessment		
			Great	Good	Bad
1	Material	Relevance of digital module material.	v	-	-
		Exercises provided.	v	-	-
		Language in delivering material.	v	-	-
2	Media	Readability of text or writing in digital module appearance.	v	-	-
		Availability of learning resource links.	v	-	-
		Pictures, illustrations and animations.	v	-	-
		Audio and video in a screencast.	v	-	-
		Adaptation of supporting hardware and software for digital module access.	-	v	-
3	Module learning	Module components support the learning.	v	-	-
		Interaction of learning activities.	v	-	-

3.2. Discussion

The development of learning modules in the information behavior course begins with the define stage, that is to determine the form of module learning materials to be developed, screencast and hyper content-based modules which are expected to support the adequacy of individual learning materials with the support of other information sources [10]. The researchers prepare the module content in the form of a document, direct the module form into a presentation material with the support of automatic screencast software, and develop learning materials with small units in video and audio packaging [14]. In the define stage, the researchers prepare supporting learning resources, it can be developed by yourself (by design) from the main learning materials developed with screencasts and it can also prepare learning resources that are freely obtained (open educational resources) and available in the cloud (by utilization), besides, it can be in the forms of YouTube videos and other forms of audio. The audiovisual feature of YouTube videos makes them appealing to students as they teach and educate in real-life situations and contexts. YouTube is a powerful teaching aid which boosts learning both inside and outside the classroom. It provides a multi-media platform for promoting all language learning skills, especially listening and speaking, together with enriching students' vocabulary in different domains and cultural backgrounds [21].

This digital module integrates the screencast-based digital learning materials which are developed with the help of software or web screencast o matic applications, it can be accessed free of charge to generate digital data to develop the form of learning videos, by optimizing the recording on the screen with a duration of 15 minutes, as shown in Figure 1.

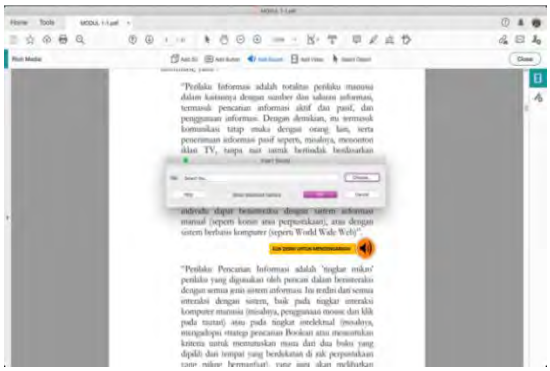
Translate:
1’ Introduction of Information Behavior

Translate:
Overview of concept Information Behavior
Late 1960s research related to information behavior began to be studied in the field of libraries and information education programs
Savolainen (1970) urges research on information behavior to include information practice
Wellisch (1972) information science has many shortcomings and should be explored further.
Marchionini (2008) using the term information as the object or central of an interesting phenomenon. Meanwhile, the activities carried out by researchers, developers, and information experts are packaged in terms of information science

Figure 1. Video Screencast process of module 1

Furthermore, Adobe Acrobat Professional software is utilized to record the sound files needed to provide the explanation of a description that is in the text of the module being studied as shown in Figure 2. Adobe Acrobat is the first software to support Adobe Systems' Portable Document Format (PDF), a type of document data format. It is a very popular electronic PDF extension, which has provided multiple versions of this software over the years, reading and extending very powerful PDFs. PDF is shortened to Portable Document Format, it can save files with extensions and share them. The security of these files is much higher than other existing extensions and encrypts files for greater security, it has a password feature to open and edit the files.

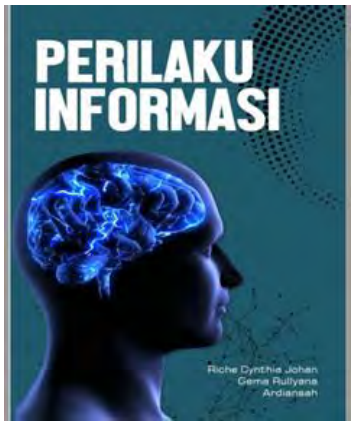
Translate:
B. DESCRIPTION
"Information behavior" is the term currently preferred to be used to describe the many ways in which humans interact with information, in particular, the way people search for and use information. T.D. Wilson reveals several definitions of Information Behavior,



Translate:
“Information behavior is the totality of human behavior in relation to sources and channels of information, including active and passive information seeking, and use of information. As such, it includes face-to-face communication with others, as well as passive reception of information such as, for example, watching TV commercials, without the intention to act on the information provided”

Figure 2. The process of adding audio to a PDF file

Adobe Acrobat has two edits which are Acrobat Reader and Acrobat Writer. Features offered: - Directly converting various common document formats, for example: i) Word and Excel to PDF; ii) Scanning books with the new OCR technology to convert to high quality eBooks; iii) Powerful and beautiful digital capabilities; iv) Adding video and audio files to PDF; v) Converting two and three dimensional designs to PDF files and many more interesting and useful features of this software, as shown in Figure 3.



Translate:
Information behavior

Translate:
Adding Video based on screen cast

…many of the challenges of selecting, annotating, and matching information artifacts to human needs remain fundamental research and development problems. One of the challenges of digital librarians is to identify the boundaries between key information objects, their metadata, their relationship to ideas and other objects, external relationships, annotations, usage traces left by others, and the history of objects on them circle of life. This includes any execution of behavior initiated within the information object itself or by an external force such as another information object, person, or machine…

Translate:
Ading audio file as one of micro leraning product

"Information behavior is the totality of human behavior in relation to sources and channels of information, including active and passive information seeking, and use of information. As such, it includes face-to-face communication with others, as well as passive reception of information such as, for example, watching TV commercials, without the intention to act on the information provided"

Figure 3. Hyper content and micro learning design of digital module

The entire provision of this digital module requires initiation from a content expert or writer (lecturer) who describes the contents of the learning materials, and educational technology experts as well as libraries and information science experts to develop digital forms of independent learning materials, and prepare learning materials that are openly available in micro learning packaging and directly utilize with the right selection and in accordance with the contents of this digital module. Some of research on micro learning support of life long learning [22], providing contextual learning experiences in providing appropriate knowledge in processing information [23] and developing content provision that is tailored to take into account the time and environment of each learner [24].

The define stage also directs the review of media experts in the context of suitability of each aspect in the module product, with excellent judgment descriptions in all aspects (organization; attractiveness, font and images) from the digital module. This is in accordance with the opinion of Rahdiyanta [25] which reveals the elements of module quality that are relevant to the assessment of product results, there are several characteristics of module quality as follow: i) Organization: including a chart display that describes the material, organizing the contents of learning material in a systematic and sequential manner, manuscripts, pictures and illustrations are neatly arranged and easily understood by students, organized arrangement among units, paragraphs, titles, subtitles and organized descriptions so that students can easily learn; ii) Attractiveness: In the module, attractiveness lies in the section: the front cover has a proportional combination of colors, pictures and lettering, the module contains several pictures or illustrations and text that can stimulate students to be interested, tasks and exercises are packaged attractively; iii) Font size and shape: Requirements for the shape and size of the letters in the module are as follow - the shape and size of

the font that are in accordance with the characteristics of students and are easy to read, there is a proportional ratio of letter sizes between titles, subtitles and content, the use of proportional capital letters and as needed.

In this study, the modules made have met the quality elements of the module in the form of a format that obtained a very good judgment range from media experts, it included the organization, attractiveness, shape and size of the letters, the accuracy of using variations of letterforms and consistency. In line with Cahyani's opinion, modules that have met the requirements for module quality elements means that the modules are of good quality [26]. Furthermore, Samsu *et al*. [27] elaborate the results of the module validation developed, it can be said to be of high quality if they meet the module feasibility test criteria where the highest percentage of components in the module is in the aspects of format, organization, attractiveness, shape and size of letters, space, and consistency.

The stage of design and development process are carried out by an expert review of the content and media expert. The review aspect includes the module content components, with the description as follow: i) Self-instruction has shown a very good assessment of all aspects ranging from clarity of objectives, material packaging or cover, availability of questions, relevant assignments, summaries, assessment instruments and availability of feedback for students and the aspect of using language received a good score, therefore this aspect can still be improved by the creators of the module; ii) In the self - contained dimension, the developed module contains all the learning materials of one standard competency or basic competence as a whole thus, this dimension got an excellent score; iii) In the adaptive dimension, the developed module is in accordance with adapting to developing technological developments therefore, this dimension obtained a very good score, and; iv) On the user friendly dimension, the developed module provides excellent value. The development of digital module is based on the design and development aspects of the hyper content and with the aid of screencast to encourage students to learn better, this is in line with the findings that show how the implementation of module development along with D&D approach that furthermore resulted in a great feasibility [28].

In the disseminate stage, the use of module is limited to students who take part in the lectures within the framework of Independent Learning and Independent Campus (Merdeka Belajar dan Kampus Merdeka /MBKM). The students responded to the modules used and examined the following aspects: i) Media suitability; ii) Material presentation, and iii) E-module learning activities. The level of appearance of the e-learning module is adjusted to the media aspect and produces information that these three aspects are great and can be accessed as independent learning materials in the information behavior course. One thing that needs to be considered is that the aspect of accessing to this digital module, which requires hardware and software plug-in readiness, that is, each student has the appropriate computer equipment and the installation of interactive pdf software on their respective computers, thus, they can run the digital module form properly.

4. CONCLUSION

The developed digital module emphasizes the design of the module content which is enriched with digital-based information sources or what is called as hyper content, which differentiates the presentation of the module content, added with the richness of audio and visual media or called as screencast. Students provide great and enthusiastic responses in adapting to the use of this digital module. Lecturers able to prepare independent learning materials with utilizing the digital technology. It expands the range of quality learning resources that are managed independently and combining learning resources both by design and utilization.

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