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DIGITAL CONTENT MODEL AS A BASIS OF CONNECTIVISM KNOWLEDGE LEARNING FOR DIGITAL SOCIETY

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Keywords:Connectivism, Civics Competency, Digital Literacy, Digital Content Model, Research and Development, Pre-Test and Post-Test, User Generated Content.

ABSTRACT

Today's learning for competency civics, is very dependent on information technology which is a form of learning theory of Connectivity, where knowledge is no longer on individuals but outside individuals who are enabled by information technology devices that are able to manage knowledge and organize knowledge on complex cyber networks on the internet. Students and digital society today are very dependent on this type of learning, in getting information, managing, and storing or publishing information.For this reason, a digital content model was developed using the research and development method proposed by Borg and Gall consists of ten steps, namely: research & study of literature, product design, design validation, product manufacture, initial product testing, product revision, product testing large scale, product revision, product specifications, and dissemination. The model was created using six components, namely: Digital Media, Writing Method, Search Engine Optimization, Social Studies Education, Knowledge, Digital Copyright. Large-scale testing is compared from pre-test and post-test, while this teaching produces digital content reported on the User Generated Content Platform. This digital learning is effective with achievement. The implementation of this digital content model shows a significant change regarding digital literacy competency which effectively increases digital literacy competence by 34.56% by approaching connectivity.

Keywords: Connectivism, Civics Competency, Digital Literacy, Digital Content Model, Research and Development, Pre-Test and Post-Test, User Generated Content.

INTRODUCTION

Digital century learning in today's society is affected by the presence of computers and the internet in obtaining information including creating information. However, this does not mean that computers or machines are intended to replace the role of educators, on the contrary technology is aimed at increasing our human capabilities. One thing that is clear is when a machine dominantly increases productivity and frees people from certain jobs so that humans can mobilize the most valuable resources for other productive activities. For example, the degree of accuracy of computers frees humans from complex computing and takes a lot of time to process it. In partnerships achieving educational goals, educators can direct, supervise guiding. Educators still need to unite students around topics, inspire, motivate in discussions, and act or be considered as 'managers' and protectors for their students. Human educators, not machines, exist and must always be at the heart of education (Newman & Blanchard, 2019). Implementative examples in this study, for example, educators ask students to look for sources of information on the internet and also make content published on the internet, as part of learning practices.

Information technology tools are increasingly easy to obtain and use (more user friendly) especially with the development of the digital age with respect to computers and the internet, in the Industrial Revolution era version 4.0 where all existing systems have been digitalized and increasingly intelligence supported by information technology infrastructure. content mechanism or sources of information have also experienced rapid changes with the presence of digital content, as a means of getting information and gaining knowledge.

This is in accordance with previous research, which emphasizes the task of educators in improving the digital competence of students so that they are able to use information technology skills in today's society. Blogging or weblog has a role for pedagogical purposes through various activities and creative through communication. As an educational tool, a blog is a user-friendly technological tool that can be integrated in the learning process. There are many ways to use blogs in teaching and learning, namely using blogs to provide information and educational insight (Azizinezhad, 2011).

In general, educators and students view that digital content is limited to digitalization into digital content. Whereas in the perspective of information technology, digital content makers should follow the rules that are in line with the indexing of data and information, so that the content is easily recognized and easy to find. Because if the content does not follow the rules of information technology, in this case SEO, no matter how good the content, the content will only be stacked and not addressed by search engines and users. As a result, the

content is minimal, there are not even readers and the content is not properly utilized as a source of knowledge and information (Gregurec&Grd, 2012).

LITERATURE REVIEW

Previous Research

When this research was conducted, there were no standards that could be used by students and the digital community to work on digital content. This becomes an obstacle due to the absence of techniques and ways of creating content that can be relied upon. This is also inversely proportional to the development and availability of information technology devices that continue to increase. As research conducted by Marsden (2012), that the empowerment of information technology tools one of them is a blog and creating blog content will improve digital literacy skills, including specifically in terms of writing ability. This study revealed that every student who used information technology tools in learning found an increase in learning motivation, as well as students' opinion that blogs and multimedia tools were useful, by using blogs a number of students were superior in making their writing. In this study students were only asked to write their writings on blogs, and this was more or less able to improve students' digital literacy abilities.

The lack of learning regarding digital literacy at school is also a factor that influences the low level of digital literacy in the community (Saudi, 2018). Digital literacy can be done by changing educational standards and also changing content that must be taught in schools. Although today students are often regarded as "digital natives" (Prensky, 2001), they may not necessarily be able to use knowledgeable digital tools (Jones et al., 2010). Therefore, students must be taught such skills and how to use technology effectively (Leu et al., 2015), including evaluating and analyzing information critically.

This is confirmed by the results of observations where 42.7% of respondents had never created digital content. Not everyone understands carefully the characteristics of digital content, some think that digital content is content that is digitized or translated to digital format by writing it using a computer or distributed on the internet. In fact, there are many other things that need to be handled carefully so that digital content meets certain standards in a digital context.

Industrial Technology 4.0

Information and computer technology in the Industrial era version 4.0, is an information distribution infrastructure as well as a means of creating digital content. Digital literacy accommodates the distribution of meaningful information and the creation of quality digital content, because it is supported by the knowledge and ability to use information technology devices.

Furthermore, the technology included in Industry 4.0 is the development of web technology and one of which is the User Generated Content Platform. In Industry

4.0, web technology has evolved until the advent of technology known as Web 3.0 (O'Reilly, 2004):

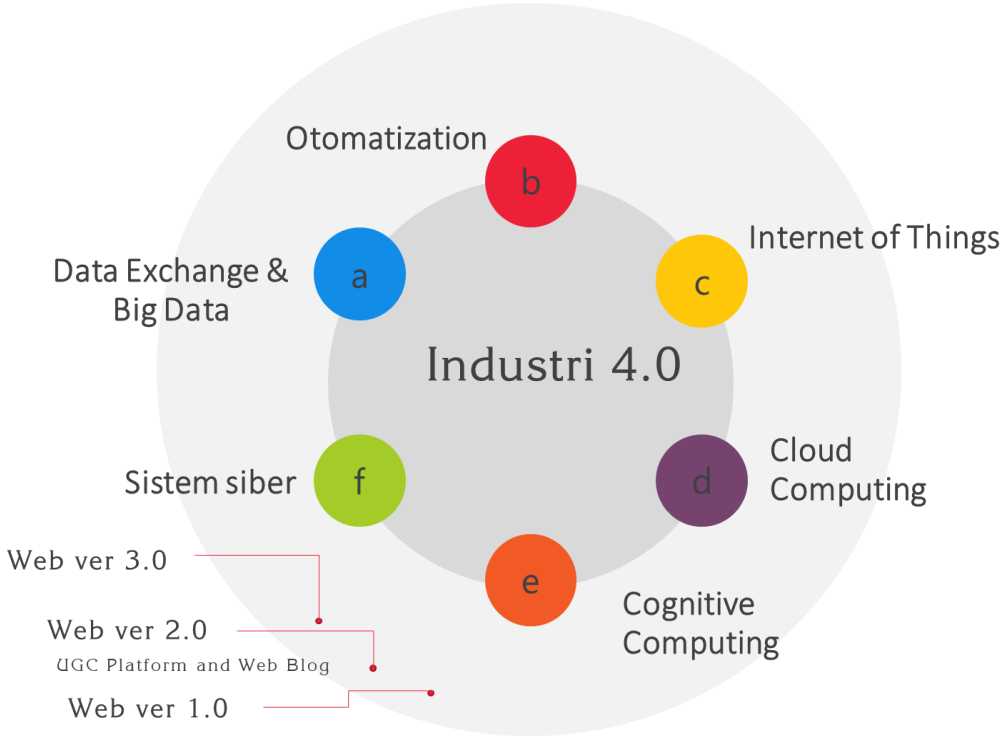

Figure 1: Information technology in Industry 4.0

The component of information technology in Industry 4.0 content is addressed in the picture above, namely in the development of the digital age, cyber systems with computer connectivity and worldwide internet network infrastructure support human activities in managing information, which in the process involves automation between digital devices and data exchange using various digital technology services such as lay computing (Cloud Computing), Internet of Thing (IoT), and Cognitive Computing. These technologies and services enable information that can be accessed and empowered with a broad reach with the internet network, always available anytime and anywhere with cloud-based storage media that provides online storage services, even large amounts of data that are identified with Big Data with technology capable of managing large amounts of data, all of this is managed intelligently with the Cognitive Computing feature, and the internet is everything for every human activity on the internet, especially in accessing, creating and distributing internet content on various computer media such as devices or various types other computer devices. Technically, this capability is closely related to the development of web technology, one of which is known as the User Generated Content Platform service in launching digital content as empowered in this research which is also one of the developments of IoT (Perera, 2013).

Connectivism Theory of Learning

The principles of connectivity are implemented in research in relation to learning this content model, as revealed by Siemens (2005), the principles and activities that are realized are as follows:

1. Learning and knowledge lie in the diversity of opinions. In this research digital content created is a form of learning and obtaining various knowledge from various sources, especially on various internet portals such as news portals, blogs or content on social media that have abundant knowledge and information content.

2. Learning is a process of connecting certain sources of information. This form of connectivity is a distinct advantage in digital media, where these sources of information are connected with digital documentation and traces, besides that the term internet or inter connecting itself becomes the holder of every entity in the cyber world so that it can be connected easily because it is supported by various digital service.

3. Learning may not lie in humans. With the existence of a smart system in the Industrial 4.0 era, the User Generated Content Platform and various services that are in it become a learning tool that releases learning dependence on humans alone, a system that can be accessed for 24 hours, anytime and anywhere can be a substitution as well as a complement of the process study.

4. The capacity to know more is more important than what is known now. The internet and digital learning open the gates of unlimited content launched around the world with internet infrastructure.

5. Maintaining and maintaining connections (connections) are needed to facilitate continuous learning. This is realized when the system is formed, in an automated way relationship that allow the exchange of information and knowledge runs continuously as long as the system and infrastructure function properly. Partnerships between humans and machines have turned the wheel of progress throughout human history, and that is why we must continue to strive for tried and true models. A machine-tested system can help us to better adapt to the fulfillment of activities, including getting and managing information and knowledge (Newman & Blanchard, 2019). Internet portals such as blogs have become one of the simplest forms of these relationships. Furthermore, blogs or internet portals can be connected with a backlink so that the information chain can be documented and accessed on target.

6. The ability to see relationships between fields, ideas, and concepts is the core of current skills (accurate and up-to-date knowledge) is the intention of all connectivity learning activities. The form of multimedia information that involves a lot of media such as text, images, audio, video and supported by digital infrastructure that can be operated continuously without space and time restrictions and information can be reported and scanned quickly with seconds to accelerate the learning process and ensure that information will continue

updated with more recent information to ensure accuracy and updates, this has become a reliable medium for the purposes of learning, accessing knowledge and information.

7. Determinants are the learning process itself. The choice of what is learned and the meaning of the information entered is experienced through the existing reality. Computers are used to enhance the experience of students, and not make them lose their human side because they continue to interact with the machine. Instead this learning should make them able to access knowledge anytime anywhere by taking various forms such as virtual avatars or holographic projections, this makes students able to be present in digital space that is rich in potential learning and flexibility. (Newman & Blanchard, 2019). In this learning, students and the community can choose sources of information and content used as part of the learning process according to the need for information and attainment of knowledge, which offers flexibility and always presents availability.

Connectivity also states the challenges faced in managing activities. The required knowledge is connected (to be connected) with the right people in the right context in order to be classified as learning. And in this case learning resources are always ready and students and the digital community can freely explore knowledge with unlimited resources on the internet.

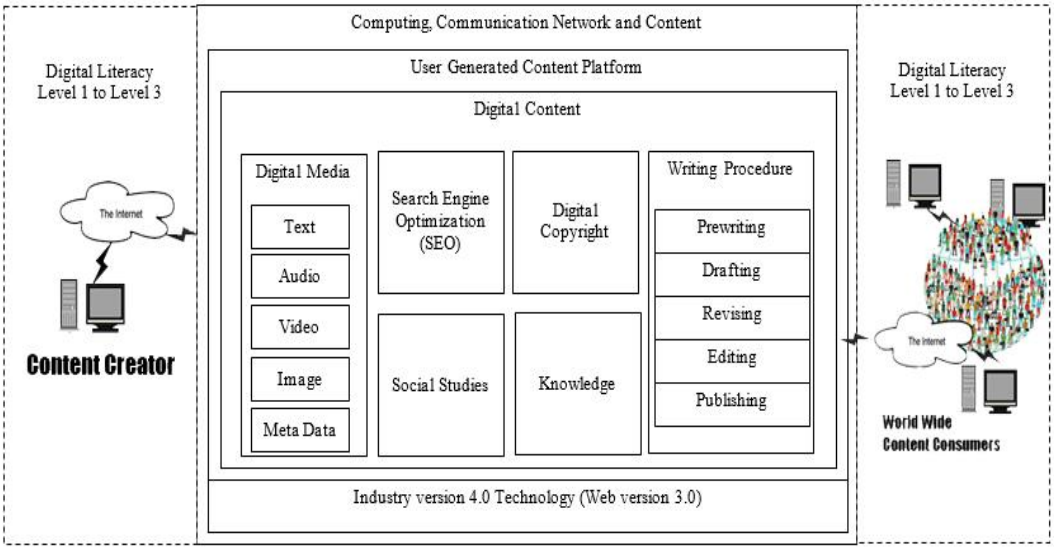

Figure 2: Diagram Block of Digital Content Model

RESEARCH METHODOLOGY

The development of this model is effective by using the research and development method proposed by Borg and consists of ten steps, namely: research & study of literature, product design, design validation, product manufacture, initial product testing, product revision, wide scale product testing, product revisions, product specifications are met, product dissemination (Brog& Gall, 1989). These ten steps

are passed entirely to produce an established digital content model and this is suitable because it is intended to create educational products. In the initial step, an in-depth literature study is conducted so that a digital content model consisting of six main components is created as a basis for creating digital content models containing social education.

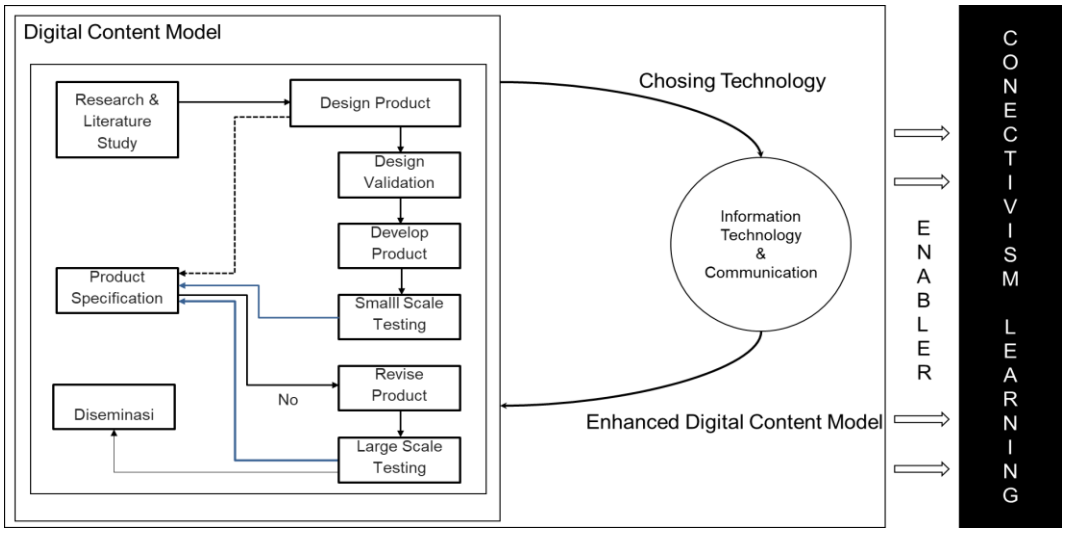

Figure 3: Research and Development Method (Borg & Gall, 1989)

The observation results show that basically the digital content model is still not much developed, this is evident from the ignorance of respondents to the digital content model and respondents' interpretations that are different from the digital content model referred to in this study. This is in line with previous studies of information technology gaps and competencies in using information technology tools as a manifestation of digital literacy competency aspects (Toffler, 1997) (Online Marketing Institute, 2016) (Tribunews, 2018). And this model is important to develop further that can be used as a guide in creating digital content, with the main goal of increasing digital literacy competence.

The model was validated before limited scale research was conducted, where experts including the participants involved in the Focus Group Discussion argued that the digital content model in this study had never been made and this was an important study to fill in the absence of guidelines for making digital content models, and in this case the digital content model is a product of social studies education that can be used by students and digital society in producing good digital content. This model can be relied on in-depth literature studies, followed by expert validation and a study of digital content models in Focus Group Discussion (Indrizal, tt) (Purwanto, 1998) involving experts as well as educators and students as model users. As a result, the audience stated that a digital content model needs to be created and the model is said to be feasible to be developed which would fill the absence of guidelines in creating digital content.

RESULTS AND DISCUSSION

Observation

After an in-depth exploration of digital content, most respondents did not know and had never heard about digital content standards that could be used as guidelines in making digital content. Digital content in question is content with information content created in digital format and accessed using information technology devices and the internet. As many as 92.24% had never heard of digital content standards, others as much as 7.75% intended the use of applications to make processed video and not digital content used as a source of information on the internet. Researchers describe the concept of digital content models, 99.24% agree with the concepts proposed by researchers, and 100% of respondents said that this research model can create useful digital content.

The digital content model developed in this study received a positive response since the introduction of the model, where in the limited scale research phase the respondents' attitudes regarding the feasibility of digital content models mapped to the category of very positive attitudes were 60% and positive attitudes by 40%. Where, there are 24 people who think that the digital content model developed is very good to be used as a digital content model to create useful content. Likewise, there are 16 people who see it as a good model.

Whereas the wide-scale test shows respondents' attitudes regarding the feasibility of digital content models mapped to the very positive attitude category, which is 69.57% and positive attitude of 30.43%. The composition of respondents consisted of 112 people who thought that the digital content model developed was very good to be used as a digital content model to create useful content. Likewise, there are 49 people who see it as a good model.

Evaluation results of the application of digital content models that can educate students and the community within the scope of the IPS Education study are carried out at several stages, where at the stage of large-scale field test results found that basically the product that has been refined after going through a limited scale test shows the model is ripe and adaptive to the needs of a wider scope. The results of the questionnaire evaluation show that the digital content model is feasible when reaching a wider and more diverse scope. So that this phase has also reached the stage of due diligence in a very broad environment in testing the effectiveness and adaptability of product designs involving users of digital content models. Based on the results of the field test, a design model that is ready to be applied is obtained, with the test results showing the feasibility in terms of methodology and substance (Creswell, 2010) (Eysenbach, Kohler, 2002).

The application of learning to create digital content is based on the six components of this digital content model, choosing the simplest example so that this model can be used in an easy and concise form. As the digital content model continues to be developed and updated in further research, its complexity will

increase. It is intended that the model is always up to date and can meet the needs of digital content that supports digital literacy competencies.

Pre-Test and Post-Test

Improving this competency was observed in each class tested. The results of the pre-test and post-test for each class were as follows: class A with a mean value of 42.66, increased to 86.5, class B by 76.16 increased to 94.66, class C by 55.5 experienced an increase to reach 86.83, class D ie 57.16 increased to reach 91.83, class E by 55.33 increased to 93.83, class F with a value of 62.66 increased to reach 92.83.

Significant changes regarding digital literacy competencies were seen in the initial average test results of 56.11% for each participant in all class groups regarding digital literacy competencies and then there was an increase in understanding of digital literacy up to 90.67%, which showed that this digital content model training effectively improved digital iteration competence is 34.56%.

In the different tests for each class tested on each pre-test and post-test data in a limited scale and wide scale study, the results of the analysis of the P value and statistical significance (P value and statistical significance) show that the Two-tailed P value <0.05, thus the difference shows that the data is very significant.

Based on the t stat analysis of research for each paired class of pre-test and post-test data results reveal that: Pre-Test Results Before Learning Content Models ≠ Post-Test Results Learning Content Models Or in other words, Learning Content Models are able to increase participants' literacy competencies students and the digital community significantly.

The results of this study are in the form of guidelines for digital content that is in line with the development of 21st century information that also has a social education content that can be employed by educators, students, and the public. This supports the promotion of a digital literacy culture for students and the public in the era of global competence in line with the government's efforts to promote digital literacy. Furthermore, the community and students are enabled not as consumers of information but also as producers of information and able to create digital content based on the content models developed in this study.

The final results regarding research achievements of digital content models based on Social Sciences were reported on the User Generated Content Platform as a means and media of liters to educate students and the digital community in general, addressed to the achievements shown in the pre-test and post-test results.

Large Scale Testing

In the large-scale test stage, participants are given a pre-test before participants or respondents create content based on digital content models, as is done in the pre-test and post-test on a limited scale test. It's just that in a broad scale test, there are

far more participants with a much broader scope, which includes involving educators, students, several institutions and the internet community or citizens. The following are the results of the pre-test and post-test on a broad scale test as follows:

Table 1: Pre-test and post-test results on a large scale test

No	Class.A		Class. B		Class. C		Class. D		Class. E		Class. F	
	Pre Test (%)	Post Test (%)	Pre Test (%)	Post Test (%)	Pre Test (%)	Post Test (%)	Pre Test (%)	Post Test (%)	Pre Test (%)	Post Test (%)	Pre Test (%)	Post Test (%)
1	30	88	83	97	40	87	37	90	42	100	45	90
2	61	89	75	90	65	84	67	87	65	95	70	90
3	32	87	65	95	60	87	60	89	55	90	60	90
4	59	80	68	90	63	85	60	90	60	88	66	89
5	30	85	78	100	55	88	65	95	55	90	75	98
6	44	90	88	97	50	90	54	100	55	100	60	100

Group A is a class of students in one of the private schools in Bandung consisting of 28 junior high school students in grade 8 which are categorized as superior classes. Group B is separated separately which are students who are also involved in creating digital content. Group C as many as 32 participants, group D as many as 25 participants and E as many as 32 participants were groups of students at a higher level, each of whom were students at three private tertiary institutions located in the cities of Bandung and Jakarta. The results of the research are digital content models, which in addition to students, include 36 digital people as the audience, therefore in this large-scale study, digital communities or citizens are involved.

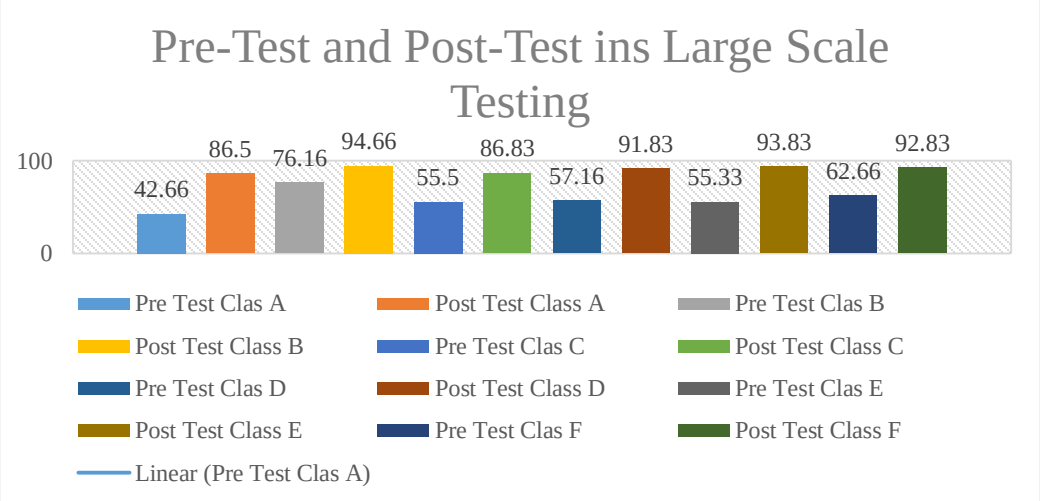

Figure 4: Graph of Pre-Test and Post-Test Results on a Broad Scale Test

The results of this pre-test and post-test found significant changes with an initial average of 56.11% for each participant in all class groups regarding digital literacy competencies and then an increase in understanding of digital literacy up to 90.67%, which shows that training in digital content models this effectively increased digital iteration competence by 34.56%.

When compared to the results of the pre-test and post-test on a limited scale test with a broad scale test, it was noted that there was an increase of 34.5% while in the limited scale test the results of the pre-test and post-test increased by 35.77%, this shows that learning that is carried out on a limited scale and wide scale is able to consistently improve digital literacy competencies for each class and group of students.

General description of achievements in relation to learning digital content aimed at improving literacy competencies of students and digital society is described as follows:

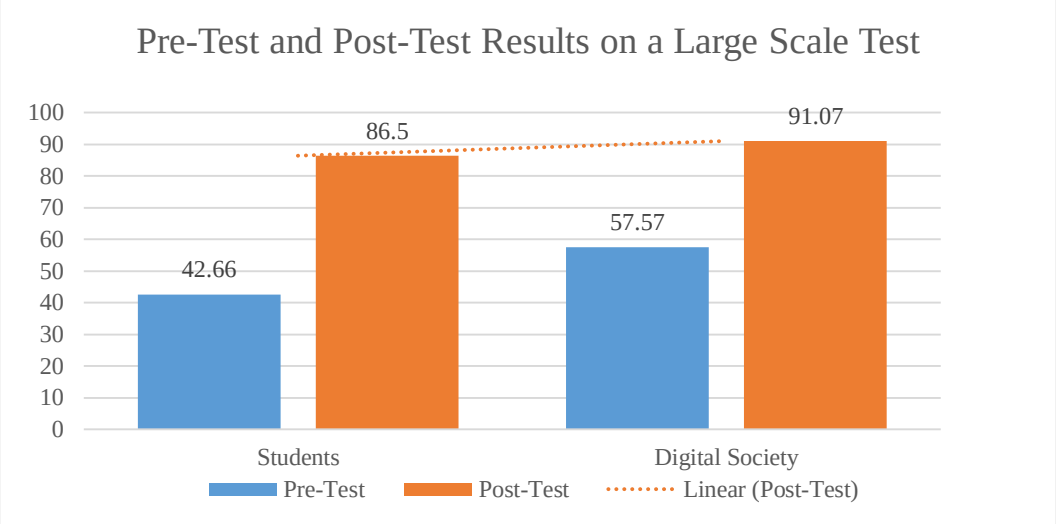

Figure 5: Pre-Test and Post-Test Results Charts on Broad Scale Tests on Students and Digital Communities

The results of this pre-test and post-test found significant changes with an initial average of 42.66% for each student and then an increase in understanding of digital literacy to reach 86.5%, while the pre-test and post-test in digital society groups in general , showing that this digital content model training effectively increased the competence of digital iteration with an initial average of 57.57% for digital society and then an increase in understanding of digital literacy to reach 91.07%, this also shows that the training of this digital content model effectively increased the competence of iteration digital for the digital community in general.

In the wide scale test, the different tests of each class were analyzed for the six classes including, classes A, B, C, D, E and F. In the different class A test with 28

students, it showed that the average scores before and after learning digital content models. Pre-Test results show the average value is 42.4968 with a standard deviation of 1.6611, Standard Error Mean (SEM) of 0.3139 while the Post-Test results after learning digital content models, the average Post-Test value is 86.4968 with a standard deviation of 1.9121, Standard Error Mean (SEM) of 0.3613 as stated in the table below.

Table 2. Paired Statistics Class A in Large Scale Testing

		Mean	N	Std. Deviation	Std. Error Mean (SEM)
Pair 1	A Pre	42.6629	28	1.6611	0.3139
	A Post	86.4968	28	1.9121	0.3613

Table 3. Paired Sample Test Class A in Large Scale Testing

	Pair Differences							
	Mean	Std. Deviation	Std.Error Mean	95%Confidence Interval of the Difference		t	df	The two-tailed P Value
				Lower	Upper			
Pair 1 Pre A Post A	-43.8339	0.825	0.156	-44.1538	-43.5140	281.1468	27	< 0.0001

Table 4. Paired Statistics Class F in Large Scale Testing

		Mean	N	Std. Deviation	Std. Error Mean (SEM)
Pair 1	F Pre	62.6697	36	3.4493	0.5749
	F Post	92.8228	36	1.3625	0.2271

Table 5: Paired Sample Test Class F in Large Scale Testing

	Pair Differences							
	Mean	Std. Deviation	Std.Error Mean	95%Confidence Interval of the Difference		t	df	The two-tailed P Value
				Lower	Upper			

Pair 1 Pre F Post F	-30.1531	3.184	0.531	-31.2305	-29.0756	56.8151	35	< 0.0001

The results of the analysis of P values and statistical significance (P value and statistical significance) show that Population 1 ≠ Population 2: P-Value = <.00001 and Two-tailed P value <0.05, thus the difference shows that the data is very significant.

The hypothesis compiled is a two-way hypothesis, namely:

Ho: μ1 = μ2
H1: μ1 ≠ μ2

Information:

Ho = Pre-Test Results Before Learning Content Model = Post-Test Results Learning Content Model
H1 = Pre-Test Results Before Learning Content Model ≠ Post-Test Results Learning Content Model

The critical point of the test - the value of t table at α = 0.05 and df = 35, tc = 2.03
In general, the use of a significance number of 0.05. Consideration of the use of these numbers is based on the level of confidence (confidence interval) desired by the researcher. Significance number of 0.05 means that the level of trust or language generally our desire to obtain truth in research is 95%.

The rejected regions of the two-tailed are: R = {t: | t | > 2.03}

Calculate the value of t:

$$t = \frac{D}{SD/\sqrt{n}} \;=\; t = \frac{-30.153}{3.184/\sqrt{36}} = -56.815$$

T-count value | t | = 56,815>tc = 2.03 then Ho is rejected.

Based on t stat analysis (56,815)> t table (2.03), it means that Ho is rejected and H1 is accepted, so it is concluded that: Pre-Test Results Before Learning Content Models ≠ Post-Test Results Learning Content Models or in other words, Learning Content Models are able Significantly increasing the literacy competencies of students and digital society.

Large-scale field testing is a broader product test, involving students in education in schools, students in higher education, educators, and society in general. This is intended to see how effective the design of digital content models is, along with the presentation. So that based on the results of the field test, effective designs and content will be obtained.

CONCLUSION

The existence of digital content models in general currently conditions the mechanism of digital content created through the process of digitizing traditional content using information technology devices, and then launching it on the internet. People in general still use the usual methods as how to create traditional content, namely digital content that is sourced from traditional content and presented in digital form through the digitization process. This is not appropriate, because basically digital content is very different than traditional content. In general, digital content that exists today, does not include things that become an important component in the manufacturing process. In fact, digital content has different mechanisms, components and handling compared to traditional content, as written in the latest research.

Digital content models containing social studies education as literacy media published on the User Generated Content Platform are developed using research and development methods consisting of ten steps, including: research & study of literature on digital content models, product design, design validation, product manufacturing, initial product testing, product revision, wide scale product testing, and product dissemination.

The development of this digital content model involves the participation of educators, students at the secondary education level, students at higher levels and digital society through internet access. Questionnaires were distributed to get responses from respondents. The test is conducted in the session before and after the training to measure the achievement of digital literacy competencies.

The digital content model developed in this research is a digital content model that consists of six main components, including: digital media, SEO, writing components, social studies components, knowledge components, and digital copyrights. The six components of the model are selected based on research related to digital content and the development of information technology.

The effectiveness of the application of digital content models that can educate students and the public within the scope of social studies education is identified in increasing students' digital literacy competencies after attending digital content creation training based on the proposed new digital content models.

Furthermore, digital content generated in the digital content model training can be accessed by all participants and participants are allowed to access the content produced before making a final assessment, this also applies to participants who

take training in digital content model via the internet. Furthermore, the participants argued that the digital content model had a positive impact in promoting digital literacy.

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