International Conference on Innovation in Open and Distance Learning (INNODEL) Presents

PROCEEDINGS

Technology for Online Education: Access, Quality, and Equity

Lembaga Penelitian dan Pengabdian kepada Masyarakat
Universitas Terbuka, Indonesia

14 -15
NOVEMBER 2021

Chief Editor:
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PENERBIT UNIVERSITAS TERBUKA

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INTRODUCTION

The first INNODEL 2021 presents the theme “Technology for Online Education: Access, Quality and Equity. This theme is expected to bring current issues and innovations in online education that needs to be advanced to promote equitable access to quality online education. The conference proceeding consists of the full paper presented on the INNODEL 2021 to share the ideas, empirical research and innovation in open and distance learning.

The INNODEL promotes the dissemination of innovation in Open and Distance Learning. The staggering growth of online learning technology has opened great opportunities for making online learning more effective and inclusive. The INNODEL is created mainly for serving the forum for educators, practitioners, policymakers, and educational technology providers to share their common interests for the betterment of online learning in the future. It is undeniable that online learning whatever the format will become a major tool for human capacity building due to its quality, flexibility, and interoperability to enable facilitating the new digital learning ecosystem.

The 2021 INNODLE becomes possible with the support from various institutions including, the BUKA Project European Union co-founded by Erasmus +; The Indonesian Association of Open and Distance Learning Professions (APJJI); The Moodle – Partner of Indonesia PC Man, University of Western Sydney, EON Reality Singapore, Nanyang Technical University Singapore and Microsoft Indonesia.

The International Conference on Innovation in Open and Distance Learning has brought those intriguing issues in online learning and provides a forum of sharing, discussion, and consultation to nurture innovation in open and distance learning through the following topics:

1. Online Pedagogy and Inclusive learning design
2. Educational Data Management and Learning Analytic
3. Augmented Reality, Virtual Reality, dan Extended Reality for Education
4. Learning management System: Interoperability-Share ability?
5. Online Examination and Assessment
6. Digital macro credential, certification, and lifelong learning journey
7. Artificial Intelligence for education

The conference proceeding serves to collect the submitted paper that already been edited by the editoral team.

2021 INNODEL Chair,

Prof. Daryono, SH, MA, PhD

CONTENTS

2021 International Conference on Innovation in Open & Distance Learning (2022 INNODEL)

A QUALITATIVE STUDY OF DIGITAL TEACHING RESOURCES INTEGRATION INTO UNIVERSITY BIOLOGY COURSES

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ABSTRACT

Faculty and students of science courses at the university level are in a nimble transition from the usual face-to-face pedagogy to the digital technology-based classes without the assumptive roadblocks or bias against or unfamiliarity with the digital world. The new normal teaching integrating digital technology have become burdensome to a few faculties with somewhat conservative attitude towards technology, and yet to some it has become a challenge and quickly pursued training to learn things quickly. Unfortunately, many of the technologies used, changed teaching and learning, to a certain degree, as a necessity of the times or convenience.

Faculty and BSc Biology students were purposively selected and interviewed using an inclusion criteria. The study did not delve into students' final course grade as effect but rather focused only on how the quality and character of teaching have been impacted by the integration of digital technology into Biology courses. Audio-recorded interviews on Zoom transcribed manually were thematically analyzed.First cycle coding was done using in vivo. Evaluation codes, were utilized during the second cycle coding using NVivo. Emerged codes from the evaluative perspective of the researchers and qualitative commentary provided a systematic collection of information of activities related to digital integration, characteristics and outcomes which provided judgment, improve effectiveness, and/or inform decisions about future development plans, programs, and policies. Codes were scored with corresponding magnitude. Positive/negative signs were further used to indicate whether a theme positively/negatively affected respondents, then tabulated and analyzed.

Digital technology integration was significantly correlated with faculty and students' attributes such as age, computer gaming experience. Biology courses need the essential alignment like the TPACK framework and advanced didactics. Digital technologies integration has been plainly limited the effects of teaching as conventional education models need to embrace changes brought about by the pandemic in the post-industrial decline.

***Keywords**: Digital Technology, Impact, Integration, Distance, Online Teaching, Digital Didactics.*

1. INTRODUCTION

The newly installed and acquired digital resources, such as MOOCs, Labster, gamified and simulated videos, whiteboard on MS, interactive and non-interactive videos including manipulatives, DIYs and internet platforms, e.g. DNA2App became the staple of the learning community. Technology can be both challenging and demanding, as it is very aggressive in its activity, in itself a contrivance. If in Philosophy technology is poesis, an activity which a person brings something into being that did not once exist, then in education technology simply means setting common standards and protocols for formatting and/or handling data so that information can then be shared (McNamara, Valdeverde & Beleno, 2018). Traditional teaching of Biology courses are designed with a lab component and is co-requisite for that course. To possibly achieve the competencies, for example in Genetics, students will need to use Escherichia coli to explore basic concepts in prokaryotic genetics such independent assortment, mutagenesis, inheritance, genotyping and even Bioinformatics. A blended learning program of both (1) hands- on and (2) computer simulation experiments must cover all those mentioned concepts and techniques, however blended learning programs are only effective when students are allowed in the labs to engage in some bench work. As it is, with extended community quarantine protocol, without the benefit of a lab, often faculties rely heavily on the said digital resources, as mentioned, simulated experiments. As a result education has changed dramatically with the distinctive rise of e-learning whereby teaching is undertaken remotely using digital platforms. To test and to endeavor ourselves using constructivist approaches (Garbett, 2011), if we have been successful in achieving our targeted goals and objectives after only a year of painstakingly integrating available digital resources we encouraged all our faculty teaching Biology to explore beyond and to assess authentic students' learning. The intent is to describe the issues of concerning the faculty as well as students. Although the 'themes' that emerged can be the product of interpretivism (Gibson, 2006), that is we impose meanings on the world that we inhabit, that we engage in cultural practices that are defined by shared interpretations; we do not operate as isolated beings but do share with other groups of people from within and outside the academe certain interpretations. The researchers have borrowed the empirically validated and widely used social cognitive theory (Bandura, 1989) as the study explores deeper into the connections between (a) technology readiness, (b) learning that is self-directed, and (c) faculty and students motivation. What are the significant impact on learner attitudes and learning behavior in traditional educational environments (Fairchild, Jeanne-Horst, Finney, & Barron, 2005).

2. METHODOLOGY

To appraise the impact the of digital technology integration in this study the researchers believe that in-depth interviews will generate the products "we were trying to find" from the specific interaction between the 'interviewee' and the 'interviewer.' For producing data this is an appropriate method, one that will give account of 'what the respondents say and how they say it. A participant informed

consent form was presented and were signed by each participant before the interview.

Interviewees were assigned a particular numerical code for identification purposes and to conceal the identity of the interviewees. A semi-structured interview schedule was created and pilot-tested. The interview schedule covered the questions regarding integration of digital technologies into Biology courses. The interview schedule have a five (5) core points clustered into: (a) changes in university operations, (b) approaches in instruction, (c) culture and social influences, (d) the use of digital resources specifically, Labster, whiteboard in MS Teams, and YouTube videos. The full interviews via zoom were audio recorded and were manually transcribed upon completion.

The the coded responses of the respondents were tabulated. The analysis was based on the scores of the magnitude coding. Magnitude codes (Saldana, 2016) are numbers in lieu of descriptive words which indicate intensity or frequency as well as such continua as weight or importance.

Selective coding (Saldana, 2016) was utilized during the underlying coding to cover and to represent any remaining codes and classifications defined up to this point in grounded hypothesis analysis. Then using the NVIVO (QRS International, 2021) software program, these codes were tagged, depending on the categories and themes and relevant texts on hand. The goal is to let the data 'speak' while the researchers tried to avoid contaminating the codes between which they seek associations or correlations to be able to extract from the data.The codes were cross-checked regularly to see whether the respective tag and data matched. Categories that emerged from the broader themes were applied to the codes. Magnitude coding of the data was then used which was more focused around the core category purposely looking for the links of the themes generated in the evaluation of the shift or integration of digital technologies into Biology courses.

Summary table No. 1

What is Working

What is working	*Res* 1	*Res* 2	*Res* 3	*Res* 4	*Res* 5	*Res* 6	*Res* 7
Attributes (computer games, digital engagement, including age, background, integrity, etc.)	+	+	+	+	+	-	+
Adaptability	+	+	-	+	+	-	+
University assistance	+	+	+	+	+	+	+
Convenience	+	+	-	+	+	-	+
Online preference	+	+	-	-	-	-	-
Totals:	**5**	**5**	**-1**	**4**	**4**	**-3**	**4**

3. FINDING AND DISCUSSION

Positive data pattern (what is working in integration)

The researchers found four important attributes (summary table no.1) that is working well in the integration of digital technologies into courses in Biology. Of the 7 respondents only 1 did not have the right attributes for example, having had a computer gaming experience when they were still young, or during senior high school. Age did not figure out, but 1 respondent mentioned she was “not really into technology” although she have had the chance to use computers during her high school years “Im not really happy, Im not really into technology, (L48R6).” The university innovated a ‘Made for Learners’ scheme of offline/online, synchronous/asynchronous platform where the basic required electronic gadget is the mobile phone. Unfortunately, despite their digital capabilities of respondents, only 2 of the respondents had preference to online mode of learning/teaching. Only five out of 7 respondents thought digital technologies made learning/teaching very advantageous, in spite of the entirety of the respondents recognized the help with coordinating innovation given by the college.

Negative data pattern (what is not working in integration)

In a question on “how these newly integrated digital technologies affecting your work/studies”, respondent 1 mentioned, on (L100R1) “it suits me, because I am a shyperson, (L109R1) “ I am quite happy about it in this sense I get to improve as well like what I said ago about having a 21st century skill..., (L112-115R1) but its very challenging.” Respondent are more patient and careful now than before when communicating through digital media even in private messages. A ‘lost in translation’ game seems to have become so common even in learning and teaching in the digital platform.

There are a lot of constraints and boundaries, connectivity issue were referenced a fewtimes for all intents and purposes by almost every one of the respondents. “Lack of internet capability...(L119R6), the only barrier would be to connect to the internet and the materials...(L180R7), the internet connectivity is a barrier...(L48R5), internet connectivity and grasping of the totality of the topic... (L156-157R4), internet signal in our place is very intermittent...”(L145-148R3). Required specs, for example of videos, digital programs, programs online are not met by some of the students who happens to have outdated laptops. Appropriately, a recreated action or investigation particularly like simulated videos in Science isn't equivalent to in real experimentation on the research laboratory.“ Laboratory based courses in Biology is such a challenge...(L64R2), its difficult without an actual lab, simulations are not very satisfactory...(L154-155R3), not as engaging as an actual lab”...(L50-51R5).

However, one respondent said simulated videos can become effective only when it is paired with active discussions...”simulations given that is paired with topic discussions will help us understand”...(L143-147R4). Plagiarism was likewise referenced by one respondent, still some assume that students will, in general pass around, using the same technology, the appropriate responses, replicating, and cheating.

Summary table No. 2
What is not working

What is not working:	*Res* 1	*Res* 2	*Res* 3	*Res* 4	*Res* 5	*Res* 6	*Res* 7
Love and hate relationship	+	+	-	-	+	-	+
Lost in translation	+	+	+	+	+	-	+
Barriers and limitations	-	-	-	-	-	-	-
Plagiarism	-	-	-	-	-	-	+
Connectivity	-	-	-	-	-	-	-
Specs	-			-	-	-	
Doing it (hands-on) is the same as different from) simulation	+	+	-	-	-	-	-
Digital technology preference	+	+	-	+	-	-	-
Totals:	**0**	**0**	**-6**	**-4**	**-4**	**-8**	**-2**

Digital technologies used

Videos have now become an every now and again utilized strategy for educating, furnishing understudies with intelligent substance that makes learning more amusing. Labster which provides students with a virtual version of the lab practical to use beforehand, teaching students the techniques, skills, processes, protocols and underlying principles of various science disciplines, “is the closest thing to an actual lab...(L34-35R2), best experience ever...(L36R2), Unfortunately for certain respondents, they couldn't utilize Labster as some of them have obsolete PCs which does not match with the required technical specs of Labster. “For Labster yes I was so excited at first with Labster I believe that it could be a good supplement for students because particularly because we don’t have these equipment but the problem with Labster is I can’t even load the entire file when my connectivity is much stronger”... (L153-156R1).Furthermore, “Yes I would say in genetics there is a lot of computations and I find it a bit difficult to have to show this solution problem solving using whiteboard compared to if I had a whiteboard marker and a actual whiteboard where in I can actually do”...(L301-303R1). Whiteboard in MS Teams utilized in problem solving in Genetics end up being exceptionally valuable and simple to utilize, however not for all.

Summary table No. 3

A. Digital technologies used.

Digital Technologies Used	Labster	YouTube	Simulated videos	Whiteboard
Easy to use	+	+	+	-
Required specs	-	+	+	+
Mobile compatibility	-	+	+	+
Totals:	**-1**	**3**	**3**	**1**

Table B a derived sequel of table A another ordered valuation of the individual respondents proceeds on digital technologies used. Three of the seven respondents have scored 4, which have posted a major impact on the accomplishment of the integration and the other three respondents also posted a slight impact and other related effects. Only one of the respondents scored 0, which means there is no effect and integration isn't working in any way.

Summary table No.4

B. Digital technologies used

Digital technologies Used	*Res 1*	*Res 2*	*Res 3*	*Res 4*	*Res 5*	*Res 6*	*Res 7*
Labster	-	-	+	+	+	-	+
YouTube	+	+	+	+	+	+	+
Simulated videos	+	+	+	+	+	+	+
Whiteboard	+	+	-	+	+	-	+
Totals:	**2**	**2**	**2**	**4**	**4**	**0**	**4**

Interpretation of their significance

Significance evaluates whether an outcome is probable because of possibility or to some factor of interest unlike the significance of certain empirical findings which is assessed by means of a null hyphothesis (de Groot,n.d.). So what is a positive impact as to the shift or integration of digital technology into Biology courses. To Denzin (1989) every technique suggests an alternate line of activity towards the real world and consequently each will uncover diverse aspect of it, like a kaleidoscope, contingent upon the point at which it is being held, it will uncover various shades and designs of objects to the viewer. The aim of the researchers is not to produce a consistent version of the subject of the study, as that subject is always socially constructed but to offset the particular weaknesses of each approach and challenged the biases that come from only one perspective (Green, & Thorogood, 2005). All interpretation is unfinished, provisional, and incomplete, it is this conceptualization in the study when it was started about when putting all the elements of associating, ordering, and making meanings that makes the data and codes and themes generated not just mere descriptions but thereby interpreting them.

4. CONCLUSION

Digital technology integration in Biology courses was significantly correlated with faculty and students attributes such as age, computer gaming experience at a very younger age, accessibility and ease of use and the innovative scheme of the university to name a few. They do have a shorter attention span so they have difficulties concentrating on a particular assignment for a longer periods of time. Age was important in a sense, these are younger respondents both faculty and students who were introduced to the concept of computing at a very early stage in their academic development. Members of this generation born between 1995 and 2010 are true digital natives, they are the ones who have been exposed to the internet, and have witnessed the digital revolution, and who have never experienced a world without the Internet. Comparing them to the Millenial generation, they are more cautious, pragmatic but because the more apparent precarious conditions they were growing upwith, they are less confident and reluctant to take over leadership posts. This hypercognitive generation is very comfortable with collecting and cross-referencing many sources of information and with integrating virtual and offline experiences (Francis & Hoefel, 2021).

However, the study finds many factors as well why integration may not work. The respondents referenced (1) technical specs prerequisite against their old outdated PCs, (2) internet connectivity was mentioned as the greatest barrier, and (3) simulations as hands-on activity as an alternative to a lab experiment was less satisfying. There were lots of meaningful activities in the videos or simulated videos but none is just about asfulfilling as going to the lab to dissect a frog or see the change/adjustment in color dueto the presence of sugar in Benedict's test. Labster was the closest thing to a lab experiment yet most students have ostracize or have thrown away the practice even it was proven to be very convenient to use. There seems to be a great difference between the traditional face-to-face model and using digital technology platform models, as well as a change in didactics and pedagogy. The uptake on simulations in the integration has been slow, perhaps because faculty and students are unaware of its benefits and partly so because it needs to target specific laboratory needs. Notwithstanding the remote faculty teaching in work-at-home scheme or lack of in-person interaction between the faculty and students, the effort to use innovative teaching/learning method as well as continuing with the basic tenets of pedagogy is important. Students who are serious about learning actually long for the eye to eye instructing, the traditional face-to-face teaching despite the convenience brought about by the digital technology integration, and regardless of the comfort achieved theadvanced innovations combination. Personal contact is always important in education to some. Individual contact is consistently significant in education, and putting together this contact is much more hard for an online course. However, there might bevarious approaches to keep in touch with student learners. The findings point out that digital technology integration needs the necessary alignment of the courses, a framework like the TPACK and digital didactics. Computerized instructional methods (digital pedagogies) allude to educating learning approaches in which new innovations change the manner in which we instruct. In this study some felt it changed their learning while others opposed and did not even take part in the full integration.

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STUDENTS PRACTICUM DURING COVID-19 PANDEMIC AT UNIVERSITAS TERBUKA: AN OVERVIEW OF STUDENTS EXPERIENCES IN THE BIOLOGY PRACTICUM COURSES

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ABSTRACT

This paper aims at describing students' learning experience following Biology Practicum during the Covid-19 Pandemic. The Practicum consists of Biology Practicum-1, Biology Practicum-2, and Science Practicum. UT students' domicile at all the Provinces of Indonesia. While this Pandemic, they conduct thepracticums under their local institution's policy and regulations. Hence, the students may choose one of thethree methods offered by the Program of Study, namely face-to-face, webinar tutorials, and a combination of both methods. This study is qualitative. Data collection was done through questionnaires consisting of several questions and statements that explore students' experience in carrying out biological Practicum in the pandemic. Samples of the study were obtained purposively. A sampling technique is used to collect datawithin several requirements, including (1) the sample is a biology education student at Universitas Terbuka;

(2) the sample is a student registered in the registration 2020.2 and 2021.1; and (3) samples are students who have taken one or two or third biology practicum courses (biology practicum 1, biology practicum 2 or practicum science). The data obtained is analyzed descriptively. From the study results on 33 selected samples, it is known that majority of the students use the method of learning practicum biology through webinar tutorials that are as much as 52%, then 27% through face-to-face and others (21%) using the blended method. The selection of learning methods is decided by several considerations such as student's time-appromante, student's learning style, student's ability, and, most importantly, consideration of risk zone status. The method of learning in biology practicum courses has its constraints. Based on the data, students who choose to follow biology through webinar tutorials and blended methods are often constrainedin Internet network stability. In contrast, students who use face-to-face methods are constrained in Limitations of equipment and materials for Practicum, distance constraints. The obstacles in these three learning methods are a lack of guidance from tutors and students' internal motivation. Thus, in this study, students need additional learning resources to minimize the obstacles they face in practice learning (especially biology practicum) during the pandemic.

***Keywords**: Biology Practicum, Learning Experience, Tutorial Webinar, Face to Face, Blended, Universitas Terbuka.*

1. INTRODUCTION

The Covid-19 pandemic had a tremendous impact on learning. Various strategies and policies are tested to minimize the impact of pandemics. Many educational institutions are experiencing difficulties with these learning restrictions. Even, the pandemic of Covid-19 caused several schoolsand universities to remain temporarily closed because face-to-face education has ended (Zalat etal., 2021). This situation stimulates the growth of online education activities. Most of faculty have been involved in the best way to offer engage students, online course materials, and conduct evaluations (Mukhtar et al., 2020).

Online learning is learning experiences in synchronous or asynchronous environments by using different devices (Dhawan, 2020). The synchronous learning environment consist of a real-time interactions between learners educators and. It possibility to get instant feedback, even though, asynchronous learning is not properly structured. Actually, online learning is not a something new,but because of this pandemic, many institutions eventually have to use this education system in order to accommodate safe learning for students. One of the higher education institutions in Indonesia that is familiar with the online learning system is the Universitas Terbuka.

Universitas Terbuka (UT) is known for its accessibility, inclusivity and flexibility. It can accommodate and provide the opportunity for Indonesian students to get involved and enrolled incollege experience (Basidin Mizal, Rayhan Izzati Basith, 2021). UT is also the state institution which organizes open and distance education. UT has a vision to become a world quality open and distance higher education institution in producing academic programs, as well as in implementing,developing, and disseminating information on open and distance higher education (Belawati et al.,2012). The system of UT does not need classroom interaction but utilizing media, such as modulesalso non-printed materials (Ratnaningsih, 2013).

Universitas Terbuka as the first distance university in Indonesia has the characteristics of a learning process provided through various media and supported by learning assistance known astutorials (Wahyuningsih et al., 2019). Belawati in Adnan (2007) stated that learning assistance services for distance students are all forms of assistance provided to students so that their study process is smooth starting from the time of registration, the learning process, during the exam evenwhen completing the exam. In a narrow sense, learning assistance services are services provided by education organizers to their students in learning teaching materials or during the learning process. The service in learning this teaching material is often referred to as a tutorial.

Holmberg in Wahyuningsih (2019) explains that the tutorial has the following functions: (a) meets the needs of students to conduct academic interaction with tutors and with fellow students; (b) assist or provide opportunities for students to develop thinking skills; (c) help students apply the knowledge and skills acquired through tasks given by tutors and then examined, commented on, and discussed by tutors; (d) special face-to-face tutorials, students can meet the need to socialize, so that the loneliness / sense of isolation experienced as PTJJ students can be reduced; (e) increasethe student's motivation to learn; and (f) trigger, spur, and

familiarize students to learn independently. Tutorials conducted at UT serve as a driver as well as trigger the student learning process. The main purpose of the tutorial is to prepare students to be able to learn independently. (Simanjuntak & Rumanta, 2013). One mode of learning at UT that is still much in demand is Face- to-Face Tutorial (TTM) is an assistance and tutoring program provided by UT that aims to triggerand spur the student's independent learning process. The implementation of the tutorial is carried out in various modes, among others, by face-to-face (Alpin Herman Saputra, Hartati, 2021). In Indonesia, the implementation of online learning through webinars is still uneven. Webinars are neologisms and portmanteau seminars and the web. To simplify, webinars are seminars that take place online over the Internet rather than offline in conventional classrooms.(Gegenfurtner & Ebner, 2019). Webinars are also interpreted as one of the useful information technology innovations to limit geographical situations where educators and participants can hold classes virtually (Wibowo et al., 2020). Webinars can be conducted through internet-connected devices and use support applications such as video conferences (zoom, gmeet etc.) that are used for remoteactivities (Ratulangi & Lan, n.d.). In the Covid-19 pandemic, UT adapts well to finding solutionsto the face- to-face tutorial process by enforcing webinar tutorials in sync using Microsoft Teams media (Alpin Herman Saputra, Hartati, 2021). At the UT, webinars in the form of tutorials are notonly used to convey theoretical material, but also practice courses. It's certainly not an easy thingto do, but it also does not reduce the many benefits provided. Some studies have proven it. The use of webinars in learning, according to Hampton et al. (2017) has an effect on the increased flexibility offered by online learning environments and students' ability to adjust while studying (Hampton et al., 2017). By attending learned through webinars, students are easier to understand and discuss related to the material provided by lecturers, students also do not feel easily bored because it is considered through webinars approaching face-to-face directly and liveliness that canbe monitored better (Hasanah et al., 2020).

2. METHODOLOGY

The type of this research is qualitative descriptive research. Data collection was done through questionnaires consisting of several questions and statements that explore students' experience in carrying out biological Practicum in the pandemic. Samples of the study were obtained purposively. A sampling technique is used to collect data within several requirements, including:

the sample is a biology education student at Universitas Terbuka; (2) the sample is a student registered in the registration 2020.2 and 2021.1; and (3) samples are students who have taken one or two or third biology practicum courses (biology practicum 1, biology practicum 2 or practicum science).

3. FINDINGS AND DISCUSSION

Student's Experiences In The Biology Practicum Courses

- *The Demographic Information of Participants*

  Participants in this study are biology education students who have followed one or more practicum courses in the Biology Education study program. The following is information on the age, gender and occupation of 33 samples of participants.

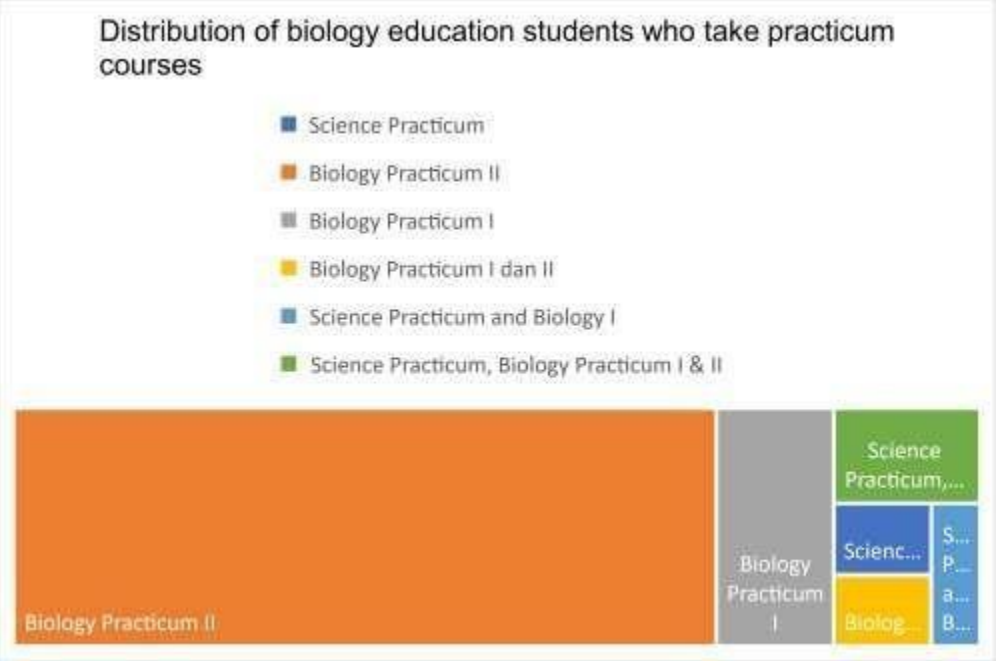
Table 1.

Student participants information

Initialname	Age (year old)	Gender	Occupation	Registration period
M1	21-30	Woman	Teacher	2021.1
M2	31-50	Man	Teacher	2021.1
M3	31-50	Woman	Teacher	2021.1
M4	31-50	Man	Teacher	2021.1
M5	Under 20	Woman	Freelancer	2021.1
M6	31-50	Woman	Teacher	2021.1
M7	31-50	Woman	Teacher	2021.1
M8	21-30	Woman	Teacher	2018.2
M9	21-30	Woman	Teacher	2021.1
M10	21-30	Woman	Teacher	2020.2
M11	31-50	Woman	Teacher	2020.2
M12	31-50	Woman	Teacher	2021.1
M13	31-50	Woman	Teacher	2020.2
M14	Above 50	Woman	Teacher	2021.1
M15	31-50	Woman	Teacher	2021.1
M16	31-50	Woman	Teacher	2021.1
M17	31-50	Woman	Teacher	2021.1
M18	31-50	Woman	Teacher	2020.2
M19	31-50	Woman	Teacher	2021.1
M20	31-50	Man	Teacher	2021.1
M21	31-50	Woman	Teacher	2020.1
M22	31-50	Man	Teacher	2021.1
M23	21-30	Woman	Teacher	2020.2
M24	31-50	Man	Teacher	2021.1
M25	31-50	Woman	Teacher	2021.1
M26	31-50	Woman	Teacher	2021.1
M27	31-50	Woman	Teacher	2021.1
M28	31-50	Woman	Teacher	2021.1
M29	31-50	Woman	Teacher	2021.1
M30	31-50	Woman	Teacher	2020.2
M31	21-30	Woman	Teacher	2021.1
M32	31-50	Woman	Teacher	2020.2
M33	21-30	Woman	Teacher	2020.2

Then, those 33 samples have taken one or more practicum courses in the biology education study program following figure 1:

Figure 1.

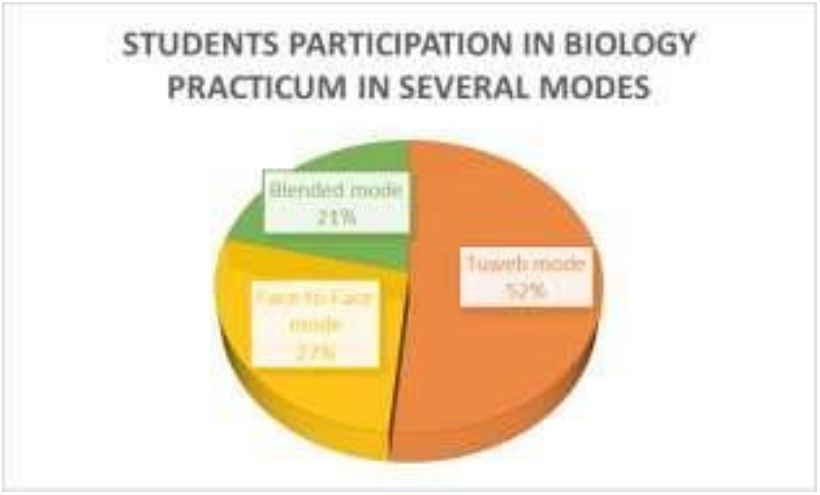


- *Student's Experience of Biology Practicum During Pandemic Covid-19*

  Before the pandemic occurred, the biologic practicum was conducted face-to-face learning in several partner laboratories in each unit. But since the pandemic occurred, Universitas Terbuka followed the head of university's policy by giving options to regional units to organize practicum learning in accordance with the risk zone of spread of covid. Students as well as follow the direction of the unit related to their practicum courses. Here's the data.

Figure 2.

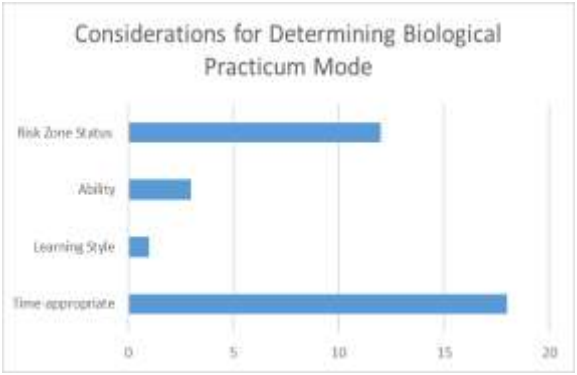
Student Distribution of biology education students who take practicum courses



Based on the data, most of the students who filled out the questionnaire, have chosen Tuweb mode for biology practicum learning. There are several reasons revealed from the determination of the practicum mode aimed in figure 3.

Figure 3.

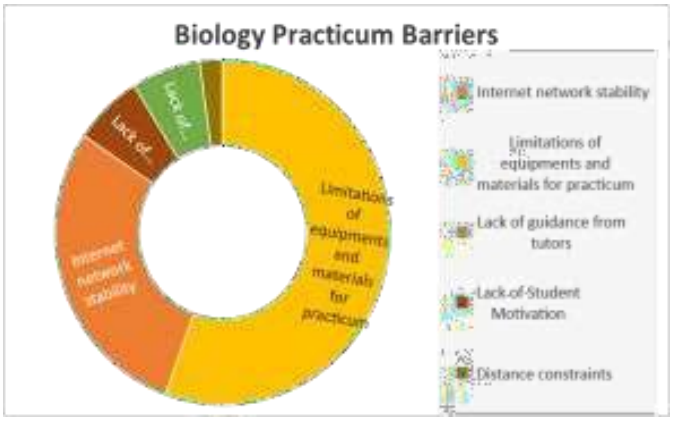
Student Distribution of biology education students who take practicum courses



- *The Barriers of Biology Practicum During Pandemic Covid-19*

  Tutorial webinar (Tuweb) is a mode of biology practicum that have chosen by most of the students. Tuweb as well as used in blended mode, because some practicum are done face-to-face but others are done through Tuweb. However, both of that three modes still have their own constraints for students to use. Figure 4 describe it.

Figure 4.
The barriers of Biology Practicum both three modes offered by Universitas Terbuka



- *Student's Hope of Biology Practicum Courses*

  Several of the students write down their suggestions and hopes for biological practicum learning,whether held through face-to-face, webinar tutorial or blended mode. Some students complained about the lack of explanation from tutors and hoped the tutors could show the experiment virtually.They also hope that there will be additional virtual learning media that can guide them in practicumso that the direction of how practicums work will be clearer. Some students also expect during this pandemic to conduct a mandatory practicum only with one type of practicum in each of the learnings in the module because most of them are constrained by the time and limited tools and materials needed for practicum.

4. CONCLUSION

Based on the data, students who choose to follow biology through webinar tutorials and blended methods are often constrained in Internet network stability. In contrast, students who use face-to- face methods are constrained in Limitations of equipment and materials for Practicum, distance constraints. The obstacles in these three learning methods are a lack of guidance from tutors and students' internal motivation. Thus, in this study, students need additional learning resources to minimize the obstacles they face in practice learning (especially biology practicum) during the pandemic.

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DETECTING DATA IRREGULARITY BY CONSIDERING RESPONSES AND RESPONSE TIME

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ABSTRACT

During a computerized test administration, either online or offline examination, the time that an examinee spends on an item can be easily recorded. This response time information, combined with item responses, could provide more information to detect data irregularities than responses alone. When some examinees answer multiple-choice test items much faster than other examinees, this could be an indication of a data irregularity. It could be occurred for many reasons, including pre-knowledge of the items and rapid guessing if running out of time at the end of a test. These aberrant behaviors, which cannot be detected from paper-based tests, could threaten test security of computerized tests, and invalidate the integrity of test results. Therefore, efforts should be made to detect data irregularities and further investigations may be needed to ensure the test results are as reliable, fair, and valid as possible. In addition, by taking care of data irregularities some researchers have shown better measures of ability (Bolsinova, De Boeck, & Tijmstra, 2017; De Boeck, & Minjeong, 2019; Marianti, Fox, Avetisyan & Veldkamp, 2014; Widiatmo & Wright, 2015).

Several methods can be used for excluding irregularities based on response times and responses (Ratcliff, 2003). One possible method is to apply a threshold method Wise and Kong (2015). This method is called Response Time Effort (RTE) that is the proportion of the items on which each examinee spent sufficient time. The other method is using a statistical model that could detect data irregularities (e.g., Anders, Alario, & Van Maanen, 2016; van der Linden, 2006; van der Maas, Molenaar, Maris, Kievlt, & Borsboom, 2011). Among them, van der Linden's (2006) developed a lognormal model to examine the relationship between item responses and latencies. This method was called the "effective response time" (ERT) in Meijer and Sotaridona (2006). ERT is defined as the time required for an examinee to answer an item correctly, and a chi-square distribution is used to check if the value is beyond a certain confidence level for given examinee ability and item parameters.

The purpose of this study is to investigate whether the RTE method and/or the ERT model can produce "cleaner" data than the current data cleaning method employed. There are three procedures of the data cleaning proposed in this study. The first is only using the RTE method, the second is only the ERT method, and the third is using those two methods together. For the third option, after excluding examinees using the first method, the remaining data are examined using the second method to investigate whether any examinees are needed to be excluded further.

Three sets of data from the three procedures are calibrated into the 3-PL IRT that is the current calibration model used. The results will be compared among the procedures and with the current calibration procedure. How many items are fit to the 3-PL IRT is the criterion measured. It is expected that the more items are fit the model for a given procedure, the more preferable the procedure is.

***Keywords**: Aberrant Behaviors, Computerized Test Administration, Item Response Theory, Response Time*

1. OVERVIEW

The time that an examinee spends on an item can be easily recorded for computer administered tests. This response time information, combined with item responses, could providemore information to detect data irregularities than responses alone. When some examinees answertest items much faster than other examinees, this could be an indication of a data irregularity that can occur for many reasons including pre-knowledge of the items and rapid guessing if running out of time at the end of a test. Variation in response times can also be important to consider. Theseaberrant behaviors, which cannot be detected from paper-based tests, could threaten test security of computerized tests and invalidate the integrity of test results. Therefore, efforts should be madeto detect data irregularities and further investigations may be needed to ensure the test results are as reliable, fair, and valid as possible. In addition, by taking care of data irregularities some researchers have shown better measures of ability ((Bolsinova, De Boeck, & Tijmstra, 2017; De Boeck, & Minjeong, 2019; Marianti, Fox, Avetisyan & Veldkamp, 2014; Widiatmo & Wright, 2015).

Several methods can be used for excluding irregularities based on response times and responses (Ratcliff, 1993). A threshold method was proposed by Wise and Kong (2005). They defined a response time boundary (T_i) between rapid-guessing and solution behaviors (SB_{ji}) for given examinee *j* and item *i* for a response time RT_{ji}. Mathematically, it is written as follows.

$$SB_{ji} = \begin{cases} 1 \; if \; RT_{ji} \geq T_i \\ 0 \; otherwise \end{cases} \qquad (1)$$

Ti is based on item length and whether or not the item uses a figure, an illustration, or reading material. The longer and the more complicated the item is, the higher T_i is.

In this study, however, due to test security concerns the author cannot examine the features of the test items to define T_i. The author used 10-seconds as a threshold, given the time required to answer a multiple choice (MC) item of a Mathematics test should be above 10 seconds (Bridgeman, Laitusis, & Cline, 2007).

Using the Wise and Kong (2005) method, an index over all items for examinee j, called Response Time Effort (RTE), is computed by:

$$RTE = \frac{\sum^{k} SB_{ji}}{k}$$ j

(2) where k is the total number of items. RTE is the proportion of the items on which examinee j spentsufficient time. If RTEi is close to 1, it indicates strong examinee effort to the test. If it is close to 0, then the examinee appears not to have performed solution behaviors for many items.

Several statistical models that incorporate item responses and response times might detectdata irregularities (e.g., Anders, Alario, & Van Maanen, 2016; van der Linden, 2016; van der Maas,Molenaar, Maris, Kievlt, & Borsboom, 2011). Among them, van der Linden's (2006) developed a lognormal model to examine the relationship between item responses and latencies. This method was called the “effective response time” (ERT) in Meijer and Sotaridona (2006). ERT is defined as the time required for an examinee to answer an item correctly, and a chi-square distribution is used to check if the value is beyond a certain confidence level for given examinee ability and itemparameters. The details of the method are discussed as follows.

2. METHOD

As discussed in van der Linden and van Krimpen-Stoop (2003), a loglinear model can be used to model response time and the model is written mathematically as follows:

$$\ln T_{ij} = \mu + \delta_i + r_j + \epsilon_{ij} \quad (3)$$

with $\epsilon_{ij} \sim N(0, \sigma^2)$ (4)

where, lnT_{ij} is the natural logarithm of the time taken by examinee j to response item i, μ is a parameter indicating the general response time level for the examinee population on the item pool,

δ_i is the response time parameter required by item i, r_j is the slowness parameter of examinee j, and ϵ_{ij} is a normally distributed interaction term between item i and examinee j with mean 0 and variance σ^2. Accordingly, the model distribution is $\ln T_{ij} \sim(\mu + r_i + \delta_j, \sigma^2)$. Therefore, the parameters of equation 3 can be estimated as follows:

$$\mu \equiv (\ln T_{ij}) \quad (5)$$

$$\delta_i \equiv (\ln T_{ij}) - \mu \quad (6)$$

$$r_j \equiv (\ln T_{ij}) - \mu \quad (7)$$

$$\sigma^2 \equiv (\ln T_{ij} - r_i - \delta_j)^2 \quad (8)$$

Moreover, Meijer and Sotaridona (2006) proposed a regression approach for modifying equation 3 as ERT that is the time required by examinee j with ability θ_j to answer correctly item

i. The ERT can be applied to an examinee if he/she answers correctly for a given item i and if his/her expected probability of answering that item is greater than the guessing parameter ( ). The rationale for these two requirements is discussed in more detail in their paper.

The ERT for each item i and for examinee j is modeled by regression ln T_{ij} on θ_j and r_j as follows:

$\ln T_{ij} = \beta + \beta_1\theta_j + \beta_2 r_j + \epsilon_j$, (9) where ln T_{ij}, θ_j *and* r_j are known, the β's are the regression coefficients, and $\epsilon_j$is an error term assumed to be normally distributed with mean 0 and variance σ^2. Then, the expected *ERT* for item
i and examinee *j* follows: $\hat{\ln T}_{iy} = E(\beta + \beta_1\theta_j + \beta_2 r_j + \epsilon_j) = \hat{\beta}_i + \hat{\beta}_1\theta_j + \hat{\beta}_2 r_j$ (10)

If *c* is an examinee suspected of having irregularity responses, then the response time ofexaminee *c* to item *i* can be evaluated against his/her expected response time as a standard normal

$Z_{ic} = \frac{\ln T_{ic} - \ln \hat{T}_{iy}}{\sigma_i}$, (11)

where $\sigma_i^2 = \frac{\sum_j (\ln T_{ij} - \ln T_{iy})^2}{(J_i - 1)}$ (12)

with J_i being the number of examinees who answer item *i* correctly. Therefore, Z_{ic}^2 is distributedas chi-square with one degree of freedom. The sum of the Z_{ic}^2 across all items answered correctly

3. PURPOSE AND METHOD

The purpose of this study is to investigate whether the RTE method and/or the ERT method can screen examinees who had irregular response time so that "clean" data can be obtained. There are three different methods/procedures of data cleaning proposed in this study. The first uses the RTE method only, the second uses the ERT method only, and the third uses both the RTE and ERT methods. For the third method, after excluding examinees using the RTE method, the remaining data are examined using the ERT method to investigate whether further examinees need to be excluded. For the RTE method, three levels of RTE for inclusion are used: ≥90%, ≥ 80%, and

≥50%. For example, if it is ≥ 90%, then examinees that spent above the response time boundary (10 seconds) on 90% or more of the total items were included. On the ERT method, three significance levels (α) are used: 0.01, 0.05, and 0.10. In total, fifteen methods (3 RTE, 3 ERT, and 9 RTE-ERT) were compared and investigated to find an optimal method for excluding data irregularities and create a clean data.

The proposed methods are used for excluding data irregularities for a multiple-choice mathematics test. The original data and each "cleaned" dataset resulting from the proposed methods were calibrated using a 3-PL IRT calibration and compared. The

number of score misfits, absolute standardized residual, the number of item-fits to the model, and chi-square goodness of fit were used to compare the methods.

The importance of this study is to estimate the relative effectiveness of each method to clean data irregularities. Also, this study is important because no previous study has compared and combined these two methods.

4. DATA

The study used data from a computerized mathematics test in an operational testing program for high school students. The test is a timed test, so that examinees had to finish the test within the allocated time. The test consists of 50 MC items with five options. Item responses along with their response times from 1,137 examinees were available for this study. The 3-PL model with fixed c parameter at 0.15 was implemented to compute the item parameters and the estimated abilities.

Table 1.

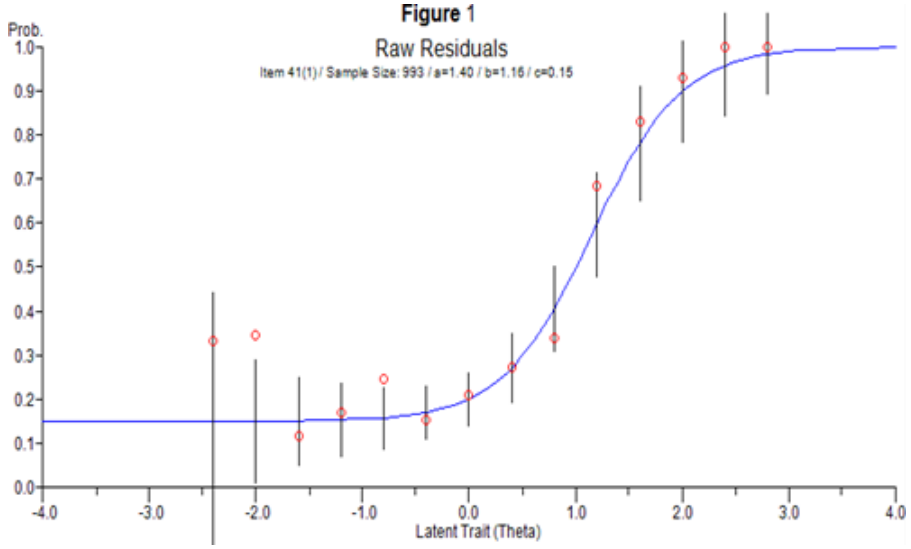
Raw and Response Time Statistics

	Raw Score	Response Time (in seconds)
Average	25.00	2788
SD	9.89	300
Min	4	722
Max	50	3330
SK	0.33	-1.98
Kur	2.42	8.72
N	1137	1137

Table 1 shows the summary statistics of the data. Given the average raw score is 25 out of 50, the test could be considered as a difficult test. On average, examinees spent 2,789 seconds for this 50-item MC test which is about 56 seconds per item. The minimum and maximum times needed by the examinees to finish the test are, respectively, about 12 and 56 minutes.

5. CRITERIA MEASURES

The original data that consists of 1,137 examinees were used as a benchmark data. The data resulted from the fifteen methods were calibrated into the 3-PL model and compared to eachother and to the results of benchmark in terms of IRT model fits to find the optimal method for excluding data irregularities. For each item on each method, the model fit was measured by the number of score misfits, absolute standardized residual, and chi-square goodness-of-fit. A plot ofestimated abilities resulted from each method is presented for an overall comparison.



As an illustration of how criterion measures were conducted in this study, ResidPlot-2 (Liang, Han & Hambleton, 2009) was used to present Figure 1. The figure shows a plot of item residuals for measuring the IRT model fit on one of the test items. The red dots are the observed proportion of examinees within the intervals, and the blue line is the expected proportion along the theta-axis with its two standard errors represented by the error bars. Among the fourteen dots,two dots are beyond their error bars and it indicates that the model is misfit at those two score intervals for the item. The number of score misfits along with absolute standardized error and thechi-square criteria were used for measuring the model fit, and they are described more detail as follows.

Number of Score Misfit

Each item was measured by how many misfit scores. The bigger the number the more misfits theitem has. Figure 1 indicates that the item has two misfit scores.

Absolute Standardized Residual

Absolute standardized residual was calculated by standardizing the residual as

$$SR_j = \frac{|O_j - E_j|}{\sqrt{\frac{E(1-E_j)}{N_j}}}$$

where O_j and E_j are respectively the observed and expected proportions of correct answers for examinees in score interval j. N_j is the number of examinees in that score interval. Graphically, Figure 1 shows that O_j is the red dot and E_j is the blue line. The overall standardized residual of each item was computed by averaging the values from all score intervals.

Chi-square goodness-of-fit

For each item i, the goodness-of-fit was computed as follows:

$$N\ (O \quad -\ )^2 \qquad k$$

$$X^2 = \sum_{j} \qquad ij \quad ij$$

where k is the number of the score intervals. This mathematical equation follows a chi-square distribution with degree of freedom equals the number of the score intervals minus the number ofitem parameters being estimated. Thus, a chi-square distribution with the significant level α = 0.05 was used to test whether or not the observed data fit the model.

Estimated Abilities

The estimated item parameters resulted from each proposed method were used to estimate all examinees' ability based on his/her score responses. Given there were 1,137 examinees, then therewere 1,137 estimated abilities for each method. The differences between these estimated abilitiesand those of the original data were computed and compared.

6. RESULTS

Table 2.

Raw amd RTs Statistics

Method	Type	Mean	SD	Min	Max	N (Exclusion)
Benchmark	Raw	25.00	9.894	4	50	
	RT	2789	301	722	3330	1137 (0%)
ERT01	Raw	26.00	9.675	4	50	
	RT	2810	265	1243	3330	993 (13%)
ERT05	Raw	26.72	9.624	4	50	
	RT	2814	258	1243	3330	944 (17%)
ERT10	Raw	27.09	9.538	4	50	
	RT	2812	257	1243	3330	904 (20%)
RTE90	Raw	28.36	9.551	5	50	
	RT	2807	237	1473	3179	731 (36%)
RTE80	Raw	27.04	9.636	5	50	
	RT	2800	260	1473	3206	912 (20%)
RTE50	Raw	25.29	9.811	5	50	
	RT	2794	286	1243	3330	1111 (2%)
RTE90_ERT05	Raw	29.30	9.219	6	50	
	RT	2808	235	1473	3179	633 (44%)
RTE90_ERT10	Raw	29.53	9.228	6	50	
	RT	2811	229	1726	3179	607 (47%)
RTE80_ERT05	Raw	28.38	9.287	6	50	
	RT	2812	239	1573	3179	767 (33%)

For the following sections, the proposed methods are coded as ERT and/or RTE with one or two index(s). For examples, ERT01 is abbreviations for Effort Response Time method with 1% of the significant level, RTE90 is for Response Time Effort with 90% of the inclusion level, and RTE90_ERT01 indicates that the two methods were used together with RTE as the first method implemented followed by ERT with their indices.

Table 2 shows the descriptive statistics of raw scores and RTs of the observed data after excluding data irregularities based on the considered method. The percentage exclusion in the last column is the percentage of the examinees that were excluded

from the original data for the given method. Due to limited space, not all results of RTE_ERT methods are presented in this paper, except for the results from three interesting methods: RTE90_ERT05, RTE90_ERT10, and RTE80_ERT05.

Compared to the benchmark, ERT01 increases the averages of raw scores and RTs by about one raw score and 21 seconds, respectively. The increases also occurred for the other two ERT methods. Within ERT methods, as the significant level decreases from 1% to 10%, the exclusion number increases from 13% to 20%, and the average of the raw scores also increases from 26.00 to 27.09. In the case of RTs, it increases from ERT01 to ERT05, but it decreases from ERT05 to ERT10.

Unlike on the ERT methods, the index on the RTE methods represents the inclusion level as the larger the number the more restriction the method is. Therefore, as the inclusion level decreases from 90% to 50%, the percentage exclusion decreases from 36% to 2%, and the averages of the raw scores and RTs decreases from 28.36 to 25.29 and 2807 to 2794, respectively.

Furthermore, the number of examinees could be further excluded if both the RTE and ERT methods are used together. Given the largest reductions of examinees for RTE and ERT methods are respectively on RTE90 and ERT10, then it is expected that RTE90_ERT10 should produce the largest examinee exclusion. The table shows that this method can reduce the number of examinees to about half of the benchmark/original data, from 1,137 to 607 with the raw score average increasing to about 4.5 (29.53 – 25.00) score points and the RTs increasing to 22 seconds.

Those results show that ERT and/or RTE can be used to exclude examinees that were indicated to have response irregularities such as the averages of raw scores and/or response times of the observed data could be increased.

Table 3.

Number of Item Misfit

Score Misfit	*Bench.*	*ERT01*	*ERT05*	*ERT10*	*RTE90*	*RTE80*	*RTE50*	*RTE90_ ERT05*	*RTE90_ ERT10*	*RTE80_ ERT05*
0	19	24	28	27	29	25	21	28	28	29
1	20	13	16	16	13	13	18	15	15	13
2	7	8	1	2	4	7	8	5	7	6
3	2	2	3	4	4	3	1	1	0	0
4	1	2	1	1	0	1	1	1	0	2
5	1	1	1	0	0	1	1	0	0	0
N	1137	993	944	904	731	912	1111	633	607	767

Table 3 shows the total number of items based on the score misfit criterion. The first column of the table is the number of score misfits from the 14 score intervals and the other columns are the number of items. For example, on the benchmark from the 50 items there are 19 items without any score misfit, 20 items with one score misfit, seven items with two score-misfits, and so on.

The table indicates that all proposed methods have more items that are fit to the 3-PL model than the benchmark. For an example, using RTE50 that is the least restricted model in which only 26 (1,137 – 1,111) examinees were excluded, the method increases the number of the item fits from 19 to 21. Within the method types,

ERT05, RTE90, and RTE90_ERT10 are respectively the best for ERT, RTE, and ERT_RTE methods.

Table 4.

Descriptive Statistics for Standardized Residual

Method	Bench.	ERT01	ERT05	ERT10	RTE90	RTE80	RTE50	RTE90_ ERT05	RTE90_ ERT10	RTE80_ ERT05
Average	0.819	0.808	0.763	0.773	0.752	0.794	0.814	0.748	0.725	0.742
SD	0.237	0.228	0.216	0.187	0.196	0.247	0.246	0.193	0.170	0.213
Min	0.410	0.447	0.391	0.440	0.456	0.422	0.377	0.438	0.459	0.401
Max	1.485	1.353	1.372	1.269	1.438	1.482	1.489	1.223	1.156	1.388

Table 4 is the descriptive statistics for the standardized residual. The averages of standardized residuals of all methods are smaller than that of the benchmark. Within the method types, the results are consistent with those of Table 3 which indicate that ERT05, RTE90, and RTE90_ERT10 are respectively the best for ERT, RTE, and ERT_RTE methods.

Table 5.

Misfit Items Based on Chi-square Goodness of Fit

Method	Bench.	ERT01	ERT05	ERT10	RTE90	RTE80	RTE50	RTE90_ ERT05	RTE90_ ERT10	RTE80_ ERT05
Item Number	5, 8, 9, 10, 13, 16, 23, 27, 29, 37, 41, 44, 45, 46, 48	5, 8, 9, 10, 16, 23, 29, 30, 37, 41, 44, 48	5, 8, 9, 16, 23, 29, 37, 44	5, 8, 9, 16, 21, 23, 27, 29, 37, 44	5, 10, 15, 23, , 24, 27, 29, 37, 44, 48	1, 5, 8, 9, 10, 11, 16, 23, 24, 27, 37, 41, 44, 48	5, 8, 9, 10, 16, 23, 27, 28, 29, 37, 41, 42, 44, 46, 48	5, 10, 23, 29, 37, 42, 44	1, 5, 9, 10, 23, 28, 37, 44	5, 9, 10, 13, 23, 27, 29, 30, 37, 44
Total	15	12	7	10	10	14	15	7	8	10
N	1137	993	944	904	731	912	1111	633	607	767

Table 5 shows the number of misfit items based on the chi-square goodness of fit. Out of the 50 items administered, as shown from the benchmark method, 15 items did not fit into the 3- PL model. Interestingly, five of the 15 items came from the last ten items of the test, and those items are 41, 44, 45, 46, and 48. In other words, one-third of the misfit items came from one-fifth of the last items. This indicates that data irregularities might occur at the end of the test when a significant number of students answered the last items much faster than they should have.

Among the ERT methods, ERT05 is the best method by reducing more than half of the misfit items from 15 to 7. Particularly, only one from the last ten items of the test was identified as a misfit item. Compared to ERT methods, RTE method might not be as optimal in terms of reducing the number of the misfit items. The number of fit items was increased when both method types were implemented together, as can be seen from RTE_ERT model, but it could not be reduced to less than 7 items. Among the RTE_ERT methods, RTE90_ERT05 is favorable.

Finally, to investigate overall relative effectiveness of each proposed method for data cleaning, the difference between the estimated abilities resulting from each method

and those from the benchmark was computed and compared. The difference was computed by subtracting the theta result of the benchmark data from the theta result of each method for a given examinee. Therefore, if it is a positive number, the method produced a larger estimation than the benchmark. Alternatively, if it is a negative number, the benchmark produced a larger estimation.

To enhance of the clarity of the results, only three methods are presented in this paper. The tree methods (ERT05, RTE90, and RTE90_ERT05) represent the favorable methods within their method types.

Figure 2.

Differences of Estimated Ability

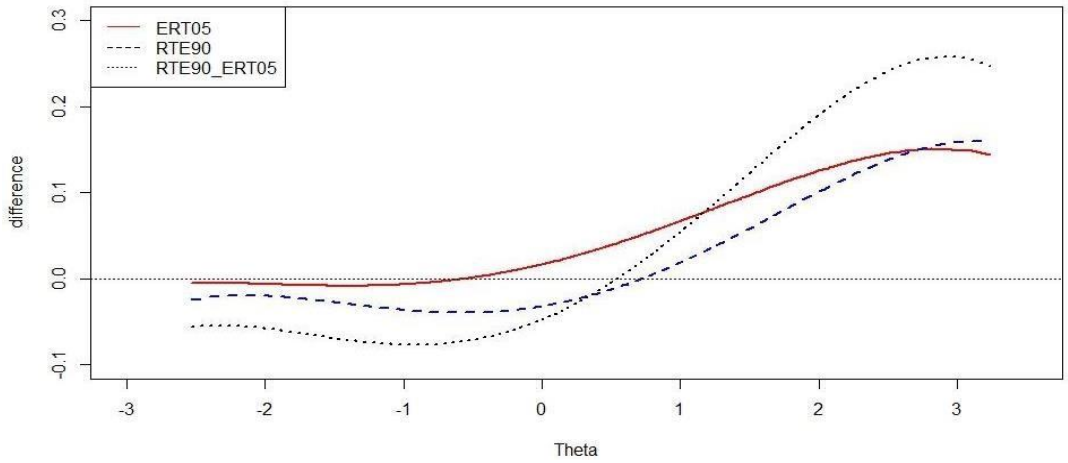


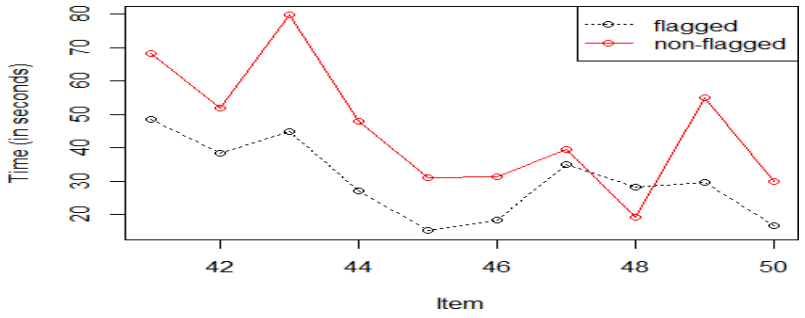
Figure 2 reveals that using different methods for data cleaning would produce different estimated abilities along the theta-axis. The values of RTE90_ERT05 are always lower or higher than those of the other two methods, except for the theta range of about 0.5 to 1.2, and the values of ERT05 are almost always higher than those of RTE90. However, given all proposed methods produced a cleaner data set than the original data by excluding examinees' responses due to their response irregularities, the three methods would produce better measures of ability than the benchmark. Particularly, using ERT05, the estimated ability would be greater than it should be for the theta range of greater than about -0.7, but it might not produce different results than the benchmark for the ranges of less than -0.7.

7. DISCUSSION AND CONCLUSIONS

This study shows that using ERT and/or RTE for excluding data irregularities would produce a "clean" data. ERT05, for example, detected 193 examinees that were indicative to have response irregularities. By excluding those examinees, the method can reduce the number of misfit from 15 items in a 50-item test to 7 (see Table 5). These data irregularities could be examined by revealing their RTs as shown in Figure 3.

Figure 3.

Average Response Times



The figure is the averages of observed RTs for a “clean” data (non-flagged examinees) and those examinees flagged on the last ten items of the test. On average, the RTs of the non-flagged examinees are longer by about 10 seconds or more than those of the flagged examinees except forthe items 47 and 48. Giventhe average RT per item is 56 seconds (see Table 1), these results mightindicate that test speediness impacted more on the flagged examinees than the non-flagged examinees. Therefore, by excluding the flagged examinees, *ERT05* can reduce the number of misfit items.

In addition to reducing the number of misfit items, the use of the methods that incorporate RTs and responses together could produce better measures of ability as shown in Figure 2. Prior studies (e.g., Marianti, Fox, Avetisyan & Veldkamp, 2014; Meijer & Sotaridona, 2006; van der Linden, 2006; Wise & Kong, 2005) found similar finding. Particularly, this paper supports the finding of Widiatmo and Wright (2015) that uncovered that the use of responses and RTs into a model might be beneficial more for able students than less able students. As shown in the figure, for each model the absolute differences are higher for higher abilities than lower abilities.

Comparing ERT and RTE methods in terms of criteria measured, ERT worked better. It can be seen in the comparison of ERT10 to RTE80 in which those two methods employed approximately the same number of examinees. Table 3 shows that the number of items having zero score misfit for ERT10 is greater than that of the counterpart (27 vs 25). Tables 4 shows the standardized residual of ERT10 is smaller than that of RTE80 (0.773 vs 0.794), and finally from Table 5 ERT10 produced smaller number of misfit items compared to the other method (10 vs 14). The use of the ERT and RTE methods together might work better than only using of ERT. However, given the improvement is small, using both methods together might not be worthwhile.

For example, Table 5 shows that using the two methods might not reduce the number of misfit items to less than 7 items that can be achieved using ERT alone.

Although the present results are generally encouraging for implementing an ERT method for excluding data irregularities, a number of considerations should be addressed. First, this study used a timed test that might be considered as a difficult test, so that many examinees might not have enough time to finish the test. Therefore, the results might be different if the test is not a timed test.

Second, the item parameter and ability estimations were based on the 3-PL model with fixed c parameter at 0.15. Different results might be obtained if a different IRT model was implemented. Third, the original data were based on a relatively small sample size (1,137 examinees). By increasing the sample size, the benefits of data cleaning might be enhanced. Fourth, the results of RTE methods were less encouraging than those of ERT methods. However, the results of RTE methods might be improved if the threshold used to define the response time boundary was defined based on the features of the test items as suggested by Wise and Kong (2005).

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DEVELOPMENT OF ANDROID-BASE LEARNING MEDIA TO DETERMINE DIGITAL LITERATURE AT SMK NEGERI 2 CILAKU

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ABSTRACT

The development of information and communication technology (ICT) in the era of globalization has had a major influence in all aspects of life, including in the world of education. In the development of information and communication technology, Android-based learning media was developed as a means of learning for students. The limited number of books that can be used by students and in conditions likenow where the learning process is carried out online requires learning media that can be used and accessed easily by students. The objectives of this study are: (1) developing android- based learning media, (2) knowing the feasibility of android-based learning media, and (3) knowing the digital literacy ofstudents by using android-based learning media as a learning resource. The development of this android- based learning media uses a research and development model with stages including identification of potential and problems, data collection, product design, design validation, design revision, small-scale trials, product revisions, large-scale trials, and product revision. The results of this study indicate that the learning media developed was declared "Decent" by material experts, media experts and linguists and students stated "Very Decent" to be used as learning media in the subject of Plantation and Herbal Commodity Processing Production. Furthermore, the learning media is applied in learning by using One Shot Case Study. Based on the results obtained, the digital literacy that students have is already in the "Very High" category for the aspect of using. As for the understanding aspect, the indicators of analyzing and creating are in the "High" category and the indicators for reflecting and acting are in the "Very High" category.

Keywords: *Android Based, Digital Litarature, Learning Media, Research and Development.*

1. INTRODUCTION

The development of information and communication technology in the era of globalization has had a major influence in all aspects of life, including in the world of education. In the development of information and communication technology, Android-based learning media was developed as a means of learning for students. This learning media is based on Android because most students already use smartphones. According to Wirawan (2011), the use of smartphone technology so far is not only focused as a means of communication or entertainment, but as a learning medium. In its use, it allows students to access material and information related to learning anywhere and anytime.

Digital literacy is one of the abilities that must be possessed by students. In UNESCO (2011), digital literacy is an important pillar for the future of education because digital literacy can be a knowledge base supported by integrated information technology and is very strategic forthe development of education in the cyber era. According to research conducted by Marty (2013), digital literacy possessed by students can be known through the use of innovative technology. According to Paul Gilster (1997) in the Ministry of Education and Culture (2017) digital literacy is defined as the ability to understand and use information in various forms from a very wide variety of sources accessed through computer devices. While computer literacy is a skill needed to retrieve information efficiently and communicate effectively using computer hardware and software, based on a conceptual understanding of computer technology and how it can be used to complete certain tasks, including an awareness of its limitations and advantages (Reitz, 2004).

Based on the results of observations made, students at SMK Negeri 2 Cilaku already use smartphones as a communication tool, but if it is used for learning media it is still very limited. Learning resources used in schools are textbooks. There are only a few textbooks available in the library, so it is not possible for students to borrow them at the same time. So that the use of this package book has not been able to make it easier for students to use it anywhere and anytime. By developing this android-based learning media, students can use it anywhere and anytime. In the subject of plantation and herbal processing production, there is one basic competency that must be understood by students, namely applying the basic principles of processing plantation products. The basic competencies consist of material characteristics, processing, to the tools used for processing plantation commodities. This competency was chosen because students get an idea of what kind of machine is used or the different characteristics of each plantation commodity being studied because it cannot be seen directly. In addition, this subject is one that is expected to be mastered by students of SMK Agribusiness Agricultural Product Processing both cognitive, affective, and psychomotor.

2. METHODOLOGY

This study uses a Research and Development research design. This design is used because research activities are used not only at the stage of user needs but also in the product development process that is made, which requires data collection and data analysis activities, namely the validation process by material experts, media experts, and linguists, while development refers to products produced in a study. Research and Development research design includes 9 stages including Potential and Problem Identification, Data Collection, Product Design, Design Validation, Design Revision, Small-Scale Trial, Product Revision, Large-Scale Trial, and Product Revision.

Learning media that have gone through the development process and are suitable for use are then implemented for students of SMK Negeri 2 Cilaku majoring in APHP who are studying Plantation and Herbal Commodity Processing Production lessons to determine their digital literacy. The research design used is One Shot Case Study. According to Arikunto (2009), One Shot Case Study is an experiment carried out without a comparison group and without a pre-test.

The population used in this study were students of SMK Negeri 2 Cilaku in the APHP department who were studying Plantation and Herbal Commodity Processing Production lessons.Data collection was carried out using a questionnaire in the validation process by experts and a student assessment questionnaire. The sample selection technique used is purposive sampling which is a method of withdrawing from a population by determining the sample with certain considerations (Sugiyono, 2008). There were 16 students identified who had Android operating system Android version 5.1 (Lollipop) or had the latest Android system.

The data analysis used is the validation of the feasibility of learning media, student assessment questionnaires, digital literacy questionnaires, validation of digital literacy questions and data analysis of digital literacy questions.

Media EligibilityValidation

The instrument used to determine the feasibility of this android-based learning media is in the form of a questionnaire. The questionnaire addressed to the experts was made using a Rating Scale with four different answer choices. The suitability of aspects can be seen in table 1. The results of the data obtained were then analyzed using descriptive statistical methods.

Score (%) = ∑ acquisition score
∑ Maximum score

Table 1.
The media eligibility percentage scale

Score	Percentage	Criteria	Conversion
4	75% -100%	Very good	Very eligible
3	50% - 74.99%	Good	Eligible
2	25% -49.99%	Bad	Not eligible
1	0% - 24.99%	Worst	Very not eligible

Student Assessment Questionnaire

Questionnaires addressed to students were made using a Rating Scale with four different answer choices. The results of the questionnaire obtained are interpreted based on the total percentage obtained by referring to table 2. The value of the student response questionnaire from small and large scale tests is done using the following equation:

$$\text{Total score Percentage (100\%)} = \frac{\text{Maximum score}}{\text{x 100}}$$

The percentage of the student response questionnaire from small and large scale tests are then determinedusing the conversion table in Table 2.

Table 2.
Interpretation of the student response questionnaire

Score	Percentage	Criteria	Conversion
4	75% < x ≤ 100%	Very agree	Very eligible
3	50% < x ≤ 74.99%	Agree	Eligible
2	25% < x ≤ 49.99%	Disagree	Not eligible
1	0% < x ≤ 24.99%	Very disagree	Very not eligible

Digital Literacy Questionnaire

Questionnaires addressed to students were made with several questions to measure the digital literacy possessed by students. The results of the questionnaire obtained are interpreted based on the total percentage obtained by referring to table 3. The formula used is as follows:

$$\text{Total score Percentage (100\%)} = \frac{\text{Maximum score}}{\text{x 100}}$$

Table 3.
Digital Literacy Questionnaire Interpretation Scale Aspects of Using

Score	Percentage	Criteria	Conversion
4	75% < x ≤ 100%	Very agree	Very eligible
3	50% < x ≤ 74.99%	Agree	Eligible
2	25% < x ≤ 49.99%	Disagree	Not eligible
1	0% < x ≤ 24.99%	Very disagree	Very not eligible

Validation of Digital Literacy Questions

The validation of this question uses the CVR (Content Validity Ratio) technique. This validity is carried out to obtain information about the compatibility between test items and indicators that have been constructed, content validity will be carried out by experts or Subject Metter Experts (SME) (Ratnasusanti, 2018). The stages in processing instrument validation are done by giving validator response criteria. The scoring of the validator responses can be seen in table 4 as follows:

Table 4.

. Validator Assessment Criteria

Score	Percentage	Criteria	Conversion
4	Very good	1	Agree
3	Good		
2	Worst	0	Disagree
1	Very worst		

This explains that if the validator answers "valid", it means that the validator agrees with the question design, so it has a weight of one. If the validator states "invalid" then it means that the validator does not agree with the question design, so it has a value of zero. According to Azwar (2017) the formula is usedas follows.

1. Calculating CVR (Content Validity Ratio)

$$CVR = \frac{(Ne - 0.5\ N)}{0.5N}$$

Information:

Ne = Number of validators who agree
N = Total Number of Validators

Calculations using CVR (Content Validity Ratio) have several provisions, namely:

- When the number of validators who agree is less than half of the total validators, then the CVR isnegative.
- When the number of validators who agree is half of the total number of validators, the CVR iszero.
- When all validators agree, the CVR is worth 1.
- When the number of validators who agree is more than half of the total validators, the CVR isworth between 0 – 0.99.
- After each item is identified using the CVR, the next step is to assess the CVI based on theinstrument validation index.

2. Calculating CVI (Content Validity Index)

The formula used for calculating the CVI value is:

$$CVI = \frac{\text{Total CVR}}{\text{Total items of the questionnaire}}$$

Calculating CVR and CVI

The results of the calculation of CVR and CVI are in the range between -1 < x < 1. Thus, thesecategories can be seen in table 5.

Table 5.
CVR and CVI Nilai Value Categories

Score	*Interpretation*
-1 < x < 0	*Worst*
0	*Good*
0 < x < 1	*Very good*

This can explain that if the results of the calculation of CVR and CVI are in the range -1 < x < 0, then the item is declared invalid, whereas if the result is in the range 0, then the item is declared valid and if the result is in the range 0 < x < 1, then the item declared very valid.

3. FINDINGS AND DISCUSSION

At the stage of identifying the potential and problems of the learning media chosen to be developed, namely the android-based learning media. This is because along with the times, communication tools such as smartphones are widely offered to support and meet the educationalneeds of students (Nurohimah, 2014). The use of smartphones as learning media can also help students in getting information to be more interesting (Oktavia, 2017).

The information collection stage is carried out to obtain data as an initial step in development. Information gathering consists of literature study, field survey, needs analysis and curriculum analysis. Based on the results of the field survey, it is formulated that the learning process can be supported by android-based learning media. This type of media is expected to make it easier for students to learn, increase learning motivation, and help improve student understanding. The learning media can contain an explanation of the material and be accompanied by an evaluation.

Product design or product planning is done by making product designs in the form of flowcharts and storyboards. Flowcharts describe the navigation flow in operating learning media on android devices. Storyboard is a visual script that is used as an outline in making learning media. Storyboards describe in detail the arrangement of images, text, effects, and other components on the learning media screen display. Learning media product development iscarried out using App Inventor. The product output is in the form of an apk file extension that can be opened on the appropriate

android device and then it will automatically install learning media on the android device.

Before the android-based learning media was used, the researcher validated it first to determine the feasibility of the developed learning media. Validation carried out by material experts, media experts and linguists. Based on the results of validation by experts, the learning media material developed was feasible with 57.14%. The material expert stated that the android- based learning media that was developed was feasible to be tested on students with improvements on the advice of material experts. The suggestion is that the correct way of writingforeign terms needs to be considered, such as the use of the word "sortation" for what should be "grading". Improvements are carried out so that students are not confused and know the right words. Musfiqon (2012) states that one of the main principles in the selection of learning mediais the principle of relevance, which means that learning media must consider the suitability and synchronization between objectives, content and evaluation of learning materials.

The results of expert validation of the learning media developed are feasible with 67.30%. Media experts stated that the android-based learning media that was developed was feasible to betested on students with improvements on the advice of media experts. The suggestion is that taking the color and background image is not right on the interface design so that the reader will feel uncomfortable. Improvements were carried out so that students were more comfortable when reading the material available on this android-based learning media. Tri (2011) stated that the aspects of the user interface and color selection in learning media can help understanding concepts by users. Thus the selection of colors in the Android-based learning media application is expected to provide convenience for students to better understand the side of the application.

The results of the validation of the developed learning media linguists are feasible with 67.50%. Linguists stated that the android-based learning media that was developed was feasible to be tested on students with improvements on the advice of linguists. The suggestion is not to include the source of the images listed in the media. Improvements were made to find out the source of the image. In accordance with the results of the assessment given by linguists, in addition to punctuation marks, terms or symbols, the language and words used in android-based learning media use words that are easy to understand so that students can clearly understand the material presented. Yuniarti, et al. (2012) explained that the use of the right words can reduce theoccurrence of concept changes and information gaps.

The design revision stage was carried out based on the advice given by the experts. Revisions were made so that the learning media developed were appropriate and the development of this android-based learning media became even better. Furthermore, the small- scale trial phase was carried out to determine the response of students to the developed android- based learning media, this trial was carried out by 4 students. This trial was also carried out to find out the advantages and disadvantages of the developed learning media and to obtain feedback and suggestions that were used as the basis for considering product revisions. The revision stage after the small-scale trial was carried out on the advice of students who gave their opinions about the developed android-based learning media.

Large-scale trials were carried out to obtain quality criteria for learning mediabased on student assessments on a large scale. The assessment was given by 16 students with various academic abilities. The assessment was carried out on learning media that had been revisedbased on the suggestions and responses of students at the small-scale trial stage. Large-scale trials use the same assessment instruments as in small-scale trials. Aspects of the assessment in the form of aspects of appearance, aspects of material presentation and aspects of benefits. Basedon all aspects, it was declared "Very Eligible" with a percentage of 85.93% in the aspect of display assessment, 87.18% for the material presentation aspect and 83.20% for the benefit aspect. According to Hadiyanti (2013), a good display aspect will make it easier for users to use learning media and continue to use learning media. Meanwhile, according to Rusman (2013), theuse of this learning media can be used as a tool in the learning process that can clarify, facilitate conveying messages so that the core subject matter as a whole can be conveyed to students. The product revision stage after a large-scale trial was carried out on the advice of students who gave their opinions about the developed android-based learning media. This revision stage is the last stage before this android-based learning media is applied or used in the learning process. suggestions that are used as revisions for product improvement are some images that are not clear because the image resolution is not good, besides that there are suggestions that theexplanations contained in each image are clarified so that students understand better.

Based on the results obtained, the digital literacy that students have in the aspect of usingcan be said to be high. Although it can be said to be high, the high level differs between each indicator. On the indicator of media use, the ability to use the expected media is to be able to use and maximize the developed android-based learning media. Based on the results obtained,namely 87.89%, digital literacy in the indicators of media use owned by students is classified as very high. According to Subrahmanyam and Smahel (2010) these results can occur because students are accustomed to using digital media in their daily lives.

Guidance indicator is the ability to use the expected direction guide, which is to be able to understand the information obtained in multimedia format. Similar to what Bawden (2001) explains, digital literacy is the ability to read and understand information in multimedia formats. Based on the results obtained, 87.50% of digital literacy in the directional indicators owned by students is classified as very high. According to Krug (2006) a media is said to be good when themedia explains who it is and its functions to users and does not make users think.

Indicators of content evaluation of the expected content evaluation ability are the ability to think critically and provide an assessment of what is found online accompanied by the ability to identify the validity and completeness of referenced information (Gilster, 1997). Based on the results obtained, 81.25% of digital literacy in the content evaluation indicators owned by students is classified as very high. This is because students are able to use and control what is displayed on the screen with the information content provided (Gilster, 1997).

And the last indicator on the aspect of using is the preparation of knowledge. The ability to prepare knowledge is expected to be able to build a collection of information obtained toevaluate the facts and opinions properly. Based on the results obtained,

81.64% of digital literacyin the indicators of the preparation of knowledge possessed by students is classified as high. According to Gilster (1997) in addition to the art of critical thinking, the competencies needed bystudents are to build a reliable set of information from several different sources which then the information obtained can be collected to form new knowledge.

For the aspect of understanding that students have for digital literacy, it is already in the highcategory. The first indicator in understanding aspects of digital literacy is analyzing. This indicator is very important for students to have because it is one of the focus goals of 21st century education (Osborne, 2013). Based on the results obtained, digital literacy in analyzing indicators owned by students is classified as high with a percentage of 68.75%. This is because the learning style of the digital native generation has the characteristics of fast learning, processing information quickly, even though in the end they cannot concentrate well, because they are looking for fast-paced information in a short time (Ghaith, 2010).

The second indicator in understanding aspects of digital literacy is creating. In this study, theability to create what is expected is to be able to create innovative products related to the material that has been read in android-based learning media. Based on the results obtained, digital literacy in the indicators of creating that students have is already high with a percentage of75%. This is because students are used to new innovations and creations during the practicum of making processing subjects. This indicator of creating is also included in the ability to think creatively. According to Foti (2014) using mobile learning in everyday use can increase the skillsthat must be possessed in the 21st century such as being creative and innovating.

The third indicator in understanding aspects of digital literacy is reflection. In this study, the expected reflection is the ability to think reflectively by making what has been answered in the aspect of creating. Based on the results obtained, digital literacy in the reflecting indicators possessed by students is classified as very high with a percentage of 89.06%. According to Fuady (2016), reflective thinking is the ability of students to select the knowledge they have and arestored in their memory to solve every problem they face to achieve the goal.

The fourth indicator in understanding aspects of digital literacy is action. The ability to act in digital literacy in this study can be described as an activity to take actions that can share knowledge, such as making a summary of how to produce good green tea based on the information that has been read. Based on the results obtained, digital literacy in the indicators of action owned by students is classified as very high with a percentage of 92.18%. This is because students have a digital native generation learning style that is able to learn and process information quickly, in line with research conducted by Ghaith (2010).

4. CONCLUSION

The development of android-based learning media in the subjects of Plantation and Herbal Commodity Processing Production refers to the R&D (Research and Development) research design with stages including Potential and Problem Identification, Data Collection, Product Design, Design Validation, Design Revision,

Small-Scale Trial, Revision Products, Large-Scale Trials, and Product Revisions. From the results of the development produced learning media that has five menus. The five menus are the coffee menu, the chocolate menu, the tea menu, the question menu, the glossary menu, and the about menu. This learning media was developed with an online-based application builder development tool called Appinventor 2 which can be accessed through the website http://ai2.appinventor.mit.edu.

Based on the results of the validation to determine the level of feasibility of the developed learning media, it was declared "Appropriate" by material experts, media experts and linguists. The results of the large-scale trial of respondents stated "Very Eligible" for the developed android-based learning media.

Based on the results obtained, the digital literacy that students have in the aspect of using "Very High" for indicators using media, guide indicators, content evaluation indicators, and indicators of knowledge preparation. As for the aspect of understanding the results obtained, there are two "high" indicators, namely the analyzing indicator and the creating indicator. The next two indicators the results obtained are “Very High” for reflecting indicators and acting indicators.

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STUDENT'S PERSPECTIVE ON THE IMPLEMENTATION OF THEPROJECT BASED LEARNING (PJBL) METHOD IN PROJECT MANAGEMENT COURSES DURING THE COVID-19 PANDEMIC

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ABSTRACT

The development of information and communication technology (ICT) in the era of globalization has had a major influence in all aspects of life, including in the world of education. In the development of information and communication technology, Android-based learning media was developed as a means of learning for students. The limited number of books that can be used by students and in conditions likenow where the learning process is carried out online requires learning media that can be used and accessed easily by students. The objectives of this study are: (1) developing android- based learning media, (2) knowing the feasibility of android-based learning media, and (3) knowing the digital literacy ofstudents by using android-based learning media as a learning resource. The development of this android- based learning media uses a research and development model with stages including identification of potential and problems, data collection, product design, design validation, design revision, small-scale trials, product revisions, large-scale trials, and product revision. The results of this study indicate that the learning media developed was declared "Decent" by material experts, media experts and linguists and students stated "Very Decent" to be used as learning media in the subject of Plantation and Herbal Commodity Processing Production. Furthermore, the learning media is applied in learning by using One Shot Case Study. Based on the results obtained, the digital literacy that students have is already in the "Very High" category for the aspect of using. As for the understanding aspect, the indicators of analyzing and creating are in the "High" category and the indicators for reflecting and acting are in the "Very High" category.

Keywords: *Android Based, Digital Litarature, Learning Media, Research and Development.*

1. INTRODUCTION

The learning process occupies a very important position and role in educational activities. In learning activities, there is a process of transmitting and transforming learning experiences to students according to the times, so the curriculum that applies in schools must be in accordance with the demands of current developments. In the midst of a volatile, uncertain, complex and ambiguous era (VUCA), the learning process is one of the keys to giving birth to a generation that is able to contribute to solving problems around them. One of the entrances to solve these problems is through the learning process. The approach to the learning process needed in the 21st century is a learning approach that can improve students' higher order thinking (HOT). High-level thinking skills include the ability to solve problems, think critically, think creatively, argue, and make decisions. One of the learning models that can improve higher order thinking skills is discovery-inquiry learning. The discovery-inquiry learning model focuses on the problem-solving process so that students must explore information in order to determine their own concepts (Adamsari, 2021).

One of the courses in the vocational education program at the Unversitas Indonesia that applies the discovery-inquiry model is the project management practicum course, in which students will be asked to look for problems that exist in the community and then formulate solutions to solve these problems, so that the learning process in practicum courses Project management is not only carried out in the classroom but outside the classroom based on real problems (project-based learning / PjBL).

In the year of the implementation, which is even semester 2021, the learning process for the project management practicum course must undergo a change in learning methods from offline learning to online learning due to the covid 19 pandemic that has hit all countries in the world, including Indonesia. Due to the spread of the Covid-19 virus which spreads through the air (droplets), activities that have the potential to cause crowds are limited by the government through the policy of Enforcement of Community Activity Restrictions (Pemberlakuan Pembatasan Kegiatan Masyarakat / PPKM) including office activities, education and worship. (Andriani, S.Si, Apt, M.Sc, Ph.D, 2020). All industry players including the education industry are trying to adapt to existing situations and conditions. The learning process must continue and the achievement of student competence must be guaranteed. So that many teachers are trying to develop learning methods that are interactive, easy to understand, and still add competence for teaching participants, especially for practical classes.

The project management practicum process which is usually carried out in the field directly to the community must be changed to online. Learning materials to support the competence of teaching participants in the field of project management are provided through the e-learning management system provided by the campus. Likewise, the process of identifying problems, formulating solutions, designing activities and implementing projects by students, are all done online. The mentoring process is carried out regularly every week for 13 meetings, at the 14th-16th meeting the project is carried out online using a zoom meeting with the webinar method.

The application of project-based learning in practicum project management courses is very challenging. The PjBL learning model is said to be successfully implemented if it has achieved the learning objectives, fulfilled the learning competencies, impressed students and had good learning outcomes. The PjBL learning model indicator in the project management practicum course is said to be successful if it meets seven aspects consisting of aspects of student interaction with the group, being able to motivate/increase student interest in learning, competence to understand learning materials, critical thinking competence, time management competence, student learning outcomes that good and the suitability of the application of the learning model with the characteristics of the subject. In this study, the researcher wanted to know the success rate of implementing project-based learning in project management practicum courses.

2. METHODOLOGY

This study describes the successful implementation of Project Based Learning in the Project Management Practicum course at the Office Administration and Secretarial Study Program, Vocational Education Program – Universitas Indonesia, during the Covid-19 pandemic. Lecture activities are from February to July 2021. Lecture activities are carried out entirely online using the Moodle, Zoom, Office365 and Bitrix24 applications.

The successful implementation of Project Based Learning in this study uses the concept of discovery-inquiry learning. discovery-inquiry is learning that focuses on the problem-solving process, so students must explore various information in order to determine their own mental.

3. FINDING AND DISCUSSION

a. Respondents Characteristics

In this study, the total population of participants for the Project Management Practicum course was 21 participants, given the limitations of the study due to COVID-19, lecture activities were carried out online, as well as the collection of questionnaires in this study was carried out online as well. From a total of 21 course participants, 21 questionnaires were returned. This research was conducted in the odd semester of 2021 at the Vocational Education Program – University of Indonesia. The data collection process is carried out from February to July 2021

b. Student Perceptions of PjBL Success Dimensions

Project-based learning is successfully implemented if it has been achieve 7 (seven) success dimensions derived from the discovery-inquiry learning model.

1) Teacher and Students Interaction

The first dimension of successful PjBL implementation is the interaction dimension between lecturers and students. In this dimension there are 5 indicators, firstly, students are more active in doing assignments in project management courses, secondly, they dare to ask the teacher, the third teacher always gives direction to each assignment, the fourth student consults with the teacher in completing the assignment work and fifthly, the student dares to express an opinion in the classroom.

Table 1.
Teacher and Student Interaction

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
Lebih aktif mengerjakan tugas dimata kuliah manajemen proyek	5%	5%	52%	38%
berani bertanya kepada pengajar setiap menghadapi kesulitan dalam mengerjakan tugas	0%	14%	52%	33%
Pengajar selalu memberi arahan pada setiap tugas	0%	14%	62%	24%
berkonsultasi dengan pengajar dalam menyelesaikan pekerjaan tugas	0%	10%	52%	38%
berani mengemukakan pendapat di kelas	0%	10%	81%	10%
Interaksi mahasiswa dengan dosen	1%	10%	60%	29%

In general, it can be seen that in the dimensions of implementing PjBL online during the pandemic,it turns out to have high success. This can be seen from this dimension, the respondents stated their agreement that if the implementation of PjBL would increase the interaction between students and lecturers by 89%.

Then from the 5 indicators that form the dimensions of the interaction between lecturers and students, there are three indicators that have a value above or equal to 90%, the three indicators are, the indicator that the implementation of PjBL makes students more active in doing assignments, then the second is the indicator that the implementation of PjBL improves the respondent's desire to consult with teachers and the last indicator is that students dare to express their opinions in public.

2) Motivate

The second dimension of the successful implementation of PjBL is the PjBL method of motivating students to carry out the learning process. In this dimension there are four indicators. The first indicator, PjBL is considered capable of realizing the imagination of participants as project implementers. The second indicator, PjBL is able to increase enthusiasm in working on the final project. The third indicator, PjBL is considered capable of providing students' ability to manage time and the fourth PjBL is considered to never give students fatigue

Table 2.
Learning Motivation

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
penerapan PJBL mewujudkan imajinasi saya sebagai seorang sekretaris	0%	5%	76%	19%
saya selalu bersemangat dalam mengerjakan final project	0%	10%	67%	24%
penerapan PJBL menambah kemampuan dalam mengelola waktu	0%	14%	43%	43%
saya tidak pernah merasa lelah dalam mengerjakan tugas	19%	38%	38%	5%
Motivasi Belajar	5%	17%	56%	23%

Based on the table above, it can be seen that 76% of students considered that the PjBL method was able to increase student learning motivation. From the four indicators, it can be seen that one indicator has a very weak level of approval, namely 43%, on the fourth indicator, namely, the statement that students never feel tired in doing assignments. During the pandemic, all courses are held online and almost all courses provide assignments every week. This makes students feel very tired, especially when they have to do project assignments in this course.

3) Understand the Learning Materials

Table 3.
Learning Motivation

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
saya jadi lebih terlatih dalam mencari solusi pada setiap permasalahan yang menghambat dalam proyek	0%	0%	71%	29%
proyek manajemen yang saya kerjakan dapat diterapkan dalam proyek yang sebenarnya	0%	0%	57%	43%
penerapan PJBL dapat menggali potensi dalam diri saya	0%	0%	67%	33%
model PJBL membuat saya menemukan ide-ide baru dalam melaksanakan proyek	0%	0%	76%	24%
Kompetensi Memahami Materi	0%	0%	68%	32%

Students' perceptions of the understanding of learning materials in the project management practicumcourse of office administration and secretarial study programs are viewed from indicators of understanding of learning materials. Questionnaire data for this variable consists of 4 questions, consisting of question indicators 1) better trained in finding solutions to every problem that hinders the project, 2) project management that is being carried out can be applied in actual projects, 3) PjBL implementation can explore potential in me, and 4) PjBL model makes finding new ideas inimplementingprojects.

Based on the 4 indicators above, 100% (21 people) gave a good and very good score that PjBL makes students better understand the learning material.

4) Critical Thinking

Table 4.
Learning Motivation

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
dengan penerapan PJBL saya jadi tau persis apa yang dihadapi oleh project manager	0%	0%	71%	29%
saya menjadi lebih paham detail management project yang harus dikerjakan nanti dilapangan	0%	0%	57%	43%
model PJBL membuat saya lebih mudah memahami tentang management project	0%	0%	67%	33%
penerapan PJBL membuat saya memahami arti setiap fase manajemen proyek	0%	0%	76%	24%
Berfikir Kritis	0%	0%	68%	32%

Student perceptions of critical thinking competence in the project management practicum course of office administration and secretarial study programs are viewed from critical thinking indicators. The questionnaire data for this variable consists of 4 questions, which consist of question indicators 1) with theimplementation of PjBL I know exactly what the project manager is facing, 2) become more aware of the details of project management that must be done later in the field, 3) the PjBL model makes it easy to understand about project management and, 4) implementation of PjBL makes understanding the meaning of each phase of project management.

Based on the 4 indicators above, 100% (21 people) gave a good and very good score that PjBL provides critical thinking competence.

5) Time Management

Table 5.
Learning Motivation

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
final proyek yang diberikan selesai tepat waktu	0%	5%	43%	52%
final proyek yang diberikan selesai tepat kualitas	0%	5%	57%	38%
final proyek yang diberikan selesai tepat biaya	0%	10%	57%	33%
saya menghabiskan waktu dirumah untuk mengerjakan final proyek	0%	0%	52%	48%
waktu belajar saya jadi lebih berarti dengan penerapan pjbl	0%	14%	71%	14%
manajemen waktu	0%	7%	56%	37%

Students' perceptions of time management competence in the project management practicum course for office administration and secretarial study programs are viewed from time management variables. The questionnaire data for this variable consists of 5 questions, which consist of question indicators: 1) the final project given is completed on time, 2) the final project is completed on time, 3) the final project is completed on time, 4) time at home runs out to work on the final. projects and 5) learning time becomes more meaningful with the implementation of PjBL.

Based on the 5 indicators above, the indicator that has the highest value is indicator 4) the time at home runs out to work on the final project, which is 100% of people. The second highest indicator is indicator no. 1) the final project given was completed on time and 2) the final project was completed on time with quality, namely 95% (20 people) gave good and very good marks. Furthermore, indicator 3) the final project was completed on cost with good and excellent scores of 90% (19 people). And lastly, indicator 5) learning time becomes more meaningful with the implementation of PjBL, which is 86% (18 people) giving good and very good scores, there are 14% (3 people) who say it is not good.

Overall, students stated that 93% of PjBL implementations provided good time management competencies.

6) Better Students Learning Outcome

Table 6.
Better Learning Outcome

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
saya puas dengan hasil nilai saya	0%	5%	38%	57%
model PJBL dapat meningkatkan hasil belajar saya	0%	5%	57%	38%
saya mendapatkan pengalaman yang nyata dari penerapan manajemen proyek pada mata kuliah ini	0%	0%	62%	38%
hasil belajar	0%	3%	52%	44%

Students' perceptions of learning outcomes in the project management practicum course of office administration and secretarial study programs are viewed from the variables of better learning outcomes. Questionnaire data for this variable consists of 3 questions, which consist of question indicators 1) satisfied with the results of the scores, 2) PjBL models improve learning outcomes, and 3) get real experience from the application of project management in this course.

Based on the 3 indicators above, the indicator that has the highest score is indicator 3) getting real experience from implementing project management in this course, namely 100% of students giving good and very good marks. The second highest indicator is indicator no 1) satisfied with the results of the score and 2) the PjBL model improves learning outcomes, which is 95% (20 people) stating good and very good.

Overall, students stated that 97% of PjBL gave better learning outcomes.

7) Suitability of the Application of Learning Models with Learning Characteristics

Table 7.
Better Learning Outco

	Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
saya menemukan kemudahan dalam mengerjakan final project	0%	14%	62%	24%
penerapan PJBL membuat mata kuliah ini menjadi lebih menarik	0%	14%	67%	19%
manajemen proyek yang saya kerjakan membuat tugas mata kuliah ini menjadi lebih nyata	0%	0%	76%	24%
model PJBL membuat mata kuliah ini menjadi lebih bermanfaat sesuai bidangnya	0%	10%	57%	33%
menurut saya, model PJBL sudah tepat diterapkan dimasa pandemi	0%	14%	62%	24%
menurut saya, model PJBL sudah tepat diterapkan pada mata kuliah ini	0%	5%	62%	33%
kesesuaian penerapan model	0%	10%	65%	25%

Students' perceptions about the application of project-based learning models (PjBL) in the project management practicum course, office administration and secretarial study programs are examined from the suitability of the application of the learning model with the characteristics of the subject. Questionnaire data for this variable consists of 6 questions, consisting of question indicators 1) finding ease in doing questions, 2) PjBL application makes courses more interesting, 3) project management makes course assignments more real, 4) model PjBL makes courses more useful according to their fields, 5) the PjBL model is appropriate to be applied during the pandemic and 6) the PjBL model is appropriately applied to this course.

Based on the 6 indicators above, the indicator that has the highest score is indicator 3) project management makes course assignments more real, namely 76% (16 people) give good marks, and 24% (5 people) give very good marks, if the indicators are added together. It received 100% positive response from students. The second highest indicator is indicator no. 6) The PjBL model has been appropriately applied to this course, which is 95% (20 people) gave good and very good grades, then indicator 4) the PjBL model makes the course more useful according to their field with good grades and very good by 90% (19 people). Next is indicator no 1) finding ease in doing questions, 2) the application of PjBL makes the course more interesting, 2) the application of PjBL makes the course more interesting and 5) the PjBL model is appropriate to apply during the pandemic, which is 86% (18 people).
) rated both good and very well.

Overall, students stated that 90% of the application of the learning model with the characteristics of the subject was appropriate.

8) Student Perceptions of the Successful Implementation of PjBL

Table 8.
Successful implementasi of Project Based Learning

		Sangat Tidak Baik	Tidak Baik	Baik	Sangat Baik
01	Interaksi mahasiswa dengan dosen	1%	10%	60%	29%
02	Motivasi Belajar	5%	17%	56%	23%
03	Memahami Materi Pembelajaran	0%	5%	50%	45%
04	Berfikir Kritis	0%	0%	68%	32%
05	manajemen waktu	0%	6%	52%	41%
06	hasil belajar	0%	3%	52%	44%
07	kesesuaian penerapan model	0%	10%	65%	25%
	Keberhasilan Penerapan PjBL	1%	7%	58%	34%

Based on table 3.3 above, we can conclude that the implementation of the PjBL method in the project management practicum course at the Office Administration and Secretarial Study Program, Vocational Education Program - University of Indonesia, has been successful, this is indicated by a score of 92% of respondents agreeing that the implementation has been successful.

Then when viewed from the seven dimensions that make up the successful implementation of PjBL, it can be seen that the fourth dimension, namely critical thinking, is the dimension with the highest level of approval, namely 100%. All respondents stated that the implementation of PjBL sharpens students' ability to think critically.

The next dimension that is considered successful in improving students' abilities is the dimension of improving learning outcomes, which is 97%, then the third dimension is an increase in understanding of learning materials by 95% and the fifth dimension is time management with an approval rate of 94%.

From the seven dimensions, one dimension is seen with the lowest value, namely the second dimension, namely increasing learning motivation. Based on the survey results, it can be seen that in this dimension the approval value in the questionnaire is only 79%. This happens because many assignments cause students to feel tired, and moreover b

4. CONCLUSION

Based on the results of the discussion above, it can be concluded that of the 7 dimensions of successful implementation of PjBL in the project management practicum course, all of them are considered successful, this can be seen from 92% of the total respondents stating that the implementation of PjBL has proven successful. Then when viewed from the 31 indicators that form the concept of PjBL success, there is one indicator that has the lowest value, namely the implementation of PjBL during the covid-19 pandemic does not give a sense of fatigue, 57% of respondents disagree and say the PjBL method is very tiring because the tasks given are very many while the courses Others give assignments too.

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DEVELOPING YOUTUBE VIDEO-BASED ENGLISH FOR HOTEL'S RECEPTIONIST FOR TOURISM STUDENTS AT GUNADARMA UNIVERSITY

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ABSTRACT

YouTube, being one of the most popular inventions on the internet, could be used as a learning medium in class, such as studying English for specific purposes, in this example for the tourism industry. As a result, the purpose of this study was to create video-based English teaching material for Gunadarma University's tourism students, as well as to gather feedback on the product and students' comprehension. The writer employed a mixed-method approach and the R&D method developed by Borg and Gall in this study for creating a learning video. This study produced English teaching materials in video form that were uploaded on YouTube. The video product was reviewed by media and material experts, as well as 30 tourism students in academic year 2020/2021. The result has shownfor display quality by experts was 86,00 %, media quality was 81,33% and for lesson quality was 85,45%. While the result from students showed for display quality was 86,25% and for material presentation was 92,88%. Among display quality and material presentation in students' survey, the highest percentage score was material presentation which got 92,88%. In conclusion, based on the feedback from tourism students, the product video was considered interesting and helpful for learning English for tourism students.

Keywords: R&D, tourism, learning video, English teaching materials

1. INTRODUCTION

YouTube is nowadays a popular media in education for sharing materials online. It grows rapidly through years and used by many lecturers and educators from all degrees. Almurashi (2016) claims that the use of YouTube in teaching the English language plays a leading role in helping learners understand their English lessons. There are numerous learning videos for all degrees in YouTube website. The use of YouTube as media learning has enhanced during Covid-19 pandemic in 2020. While schools are held online, many teachers share their presentation of materials in YouTube so the students able to understand the materials clearly and can repeat the videos anytime if needed.

On the other hand, the writer discovered that it's difficult for some lecturers to give materials online as they are not familiar with digital learning. There are many lecture videos on YouTube that the writer has found, but most of them still lack of editing skill, hence make them not interesting to watch. Furthermore, the writer discovered that within tourism program's teaching-learning activities in Gunadarma University, online media has not been used extensively. Therefore, the writer developed animation video learning program to make the learning video more engaging for the students.

This study was carried out with the aim of developing video-based teaching materials for tourism students to learn English and obtaining input on the English teaching materials themselves in order to enhance conversation capacity relevant to tourism/hotel discussions. YouTube has been chosen as the media learning platform for Gunadarma University's tourism students.

2. METHODOLOGY

As this research is meant to generate a product for educational purposes, this research employs R&D as a research approach. The product is YouTube video-based English learning program for hotel's reception that is created for Tourism Students at Gunadarma University. The video contains a conversation between hotel's reception and hotel's guest with two topics included which are describing hotel's facilities and explaining local tourist attractions to hotel's guest. This product is expected to be helpful for Tourism Students at Gunadarma University or any party who need it.

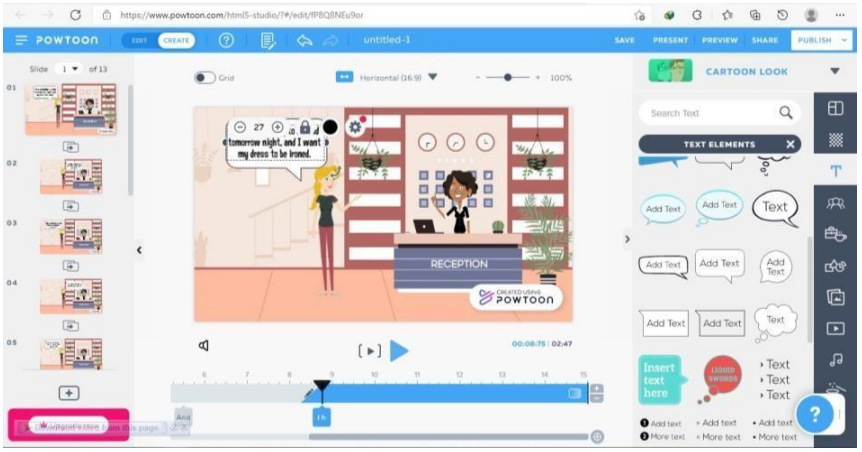
Borg and Gall (1983, p. 772) defines educational research and development (R&D) as a process used to develop and validate an educational product. In developing the product, the writer used three stages of the model of the educational R&D; First, Pre-Model Developing, which is the planning of program ideas. Second, Model Developing of Video Production which includes Pre-production Planning: The Idea and The Script, Production, and Pos- Production activity. The third step is Model Evaluation which means the video product is being evaluated by experts. And the last is Model Practice which is the product video is used by tourism students in Gunadarma University.

a. Findings and Discussion
b. Production Progress
    1. Preproduction

        In the first stage of production, the writer gathered ideas and materials in making script for the learning video. Afterwards, the writer wrote the video script in storyboard form to help the editing process later. In writing the script and the storyboard, the writer studied the materials from LSP module for English Literature by Gunadarma University as a guidance to make the conversation between the receptionist and the guest using the materials the writer has read in LSP module.

2. Production

Figure 1.
Powtoon video making



In production stage, the writer created the learning video by using online animation maker called Powtoon. It is simple to use as it's similar with using Powerpoint and provides fascinating animation movements for the characters so the video appears more alive. For the free account, Powtoon could function so well with properties, backgrounds, characters, templates that are already provided. Post-Production

3. Post-Production

In this stage, the writer used Adobe Premiere Pro as editing software to finish the process of video production. When everything was finished, the writer dubbed the video using a microphone directly in Adobe Premiere Pro. The writer dubbed the reception character as well as the narrator. To make the video more enjoyable to watch, the writer added background music when the presenter's voice-over appears in the video while doing the introduction, explanation, and closing segments. In conclusion, the learning animation video titled *English for Tourism – Hotel's Receptionist* is total 13.34 minutes long. The writer then posted the video to YouTube as a source for respondents to complete the survey, with the link https://youtu.be/2-gg5RWvJH8.

c. Data Analysis

The writer delivered the survey to 5 media and material specialists as well as 30 students enrolled in Gunadarma University's tourism department and from other universities for the academic year 2020/2021. The survey includes display, media, and lesson quality aspects that advisors and experts must complete in order to determine whether the product is suitable for application. The survey for tourism students, on the other hand, includes display and material presentation quality to determine product feedback from students studying English conversation for tourism utilizing a video-based learning program.

Table 1.

Score criteria.

Percentage	***Value***
0% - 19,99%	*Very Poor*
20% - 39,99%	*Poor*
40% - 59,99%	*Fair*
60% - 79,99%	*Excellent*
80% – 100%	*Very Excellent*

The survey score is given on a scale ranging from Very Poor to Excellent, with the Likert Scale used to gauge opinions and perceptions regarding the features. Respondents will be asked to choose one of the following options: 1, 2, 3, 4, or 5. The values are represented by numbers as follows: (1) Very Poor (2) Poor (3) Fair/Average (4) Good and (5) Excellent.

1. Experts Evaluation

   The writer conducted the evaluation by distributing a survey to 10 experts to assess the product's suitability. It can be converted into a percentage using the formula below.

$$P = \frac{x}{Xi} \text{ x } 100\%$$

P = Percentage

X = Total answer score (Excellent + Good + Fair + Poor + Very Poor)

Xi = Total ideal score (Total questions x total participants x ideal score)

- Display Quality

Figure 2.
Display Quality

No	Aspects	E	G	F	P	VP
1.	Use of fonts type and size	2	3			
2.	Color composition	3	2			
3.	Graphic and Picture	3	1	1		
4.	Video	3	2			
5.	Animation	2	2	1		
6.	Voice / narrative clarity	2	1	1	1	
7.	Music and sound effect	2	2	1		
8.	Screen design	2	2	1		
9.	Term explanation	1	4			
10.	Language utilization	2	3			
	Total	22	22	5	1	

Using the formula above, if the optimal score is obtained when all participants answer 5 questions for each question, the total ideal score (Xi) is 10 times 5 times 5, resulting in is equal to 250

Total answer of Excellent	=	*22 x 5*	*= 110*	
Total answer of Good Total answer of Fair	=	*22 x 4*	*= 88*	
Total answer of Poor	=	*5 x 3*	*= 15*	
	=	*1 x 2*	*= 2*	**+**
Total (X)	=		***215***	
Percentage	=	$\frac{215}{250}$ *x 100%*		
	=	***86,00***		

- Media Quality

This section of the survey has 15 questions about the product's media quality. If the ideal score is obtained when participants answer 5 for each question, the overall ideal score (*Xi*) is 15 times 5 times 5, which equals **375**. Based on the data, the highest amount of total score for media quality aspect is (G) or Good with 47 that received 7 votes for 2 aspects in audio clarity makes the video more interesting and Compatibility of text layout. With the total percentage of all 15 aspects is 81,33%, it can be concluded that the media quality is considered as good by the experts.

- Lesson Quality

  This part of survey contains of 11 questions regarding to lesson quality aspects. If the ideal score is when the participants answer 5 for each question, then the total of ideal score (Xi) is 11 times 5 times 5 which equals 275. Based on the data, the highest amount of total score for lesson quality aspect is (G) or Good with 28 and total percentage from all 11 aspects is 85,45%. Therefore, this last aspect is considered good as well.

2. Survey by Tourism Students

   Based on a field test conducted by sending a survey to 30 Gunadarma University and other universities' tourism students, it can be converted into a percentage using the same formula as for the experts one.

   - Display Quality

     This survey includes 8 questions about display quality, with the greatest score being. If the optimal score is when participants respond 5 for each question, the total of the ideal score (Xi)is 8 times 30 times 5, which equals **1200**.

     According to the data, the most popular value among responders is (G) or good, with 113 votes. The highest percentage score obtained by image display quality aspect with 90,6% and 17 votes for (E) or Excellent, followed by presentation of the text quality with 90% and got 17 votes as well for (E) or Excellent. It is possible to conclude that the video's image display quality is the most noticeable aspect from the video. Furthermore, the total percentage for display quality is 86,25%. It signifies that the video is regarded as very excellent.

   - Quality of Material Presentation

     This survey covers 12 questions about the product's material presentation quality, with the maximum score being 5 for excellent (E) and the lowest score being 1 for very poor (VP). If the optimal score is when participants respond 5 for each question, the total of the ideal score (Xi) is 12 times 30 times 5, which equals 1800.

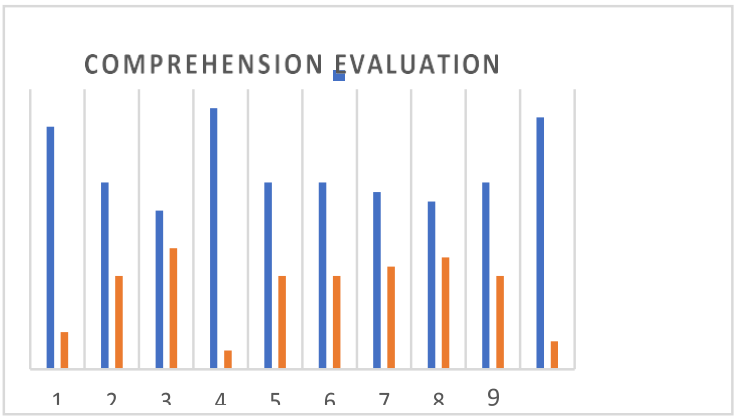
     In accordance with the data, the most voted value is (E) for Excellent with total score

     207. This is also confirmed by the overall percentage, which has reached 92,88 %, which, based on the score criteria in table 1, indicates that the material value is excellent. As a result, it is possible to infer that the material offered in the video is high quality and capable of assisting students in their learning. Students also agreed that the learning video might encourage them to learn English better.

- Comprehension Evaluation

  The comprehension evaluation consists of 10 multiple-choice questions about the two topics in the video-based learning program, covering comprehension, grammar, vocabulary questions in random order. Based on the data below, the highest percentage question answered correctly by the respondents is question number 10 with 90% and the incorrect percentage reaches only 10%. Meanwhile, the lowest percentage question answered correctly is question number 3 with 56,7% but still higher than the incorrect percentage which reached 43,3%. The second lowest is question number 8 with 60% correct percentage and got 40% incorrect percentage. There are 4 questions that reached the same amount of correct and incorrect percentage, they are number 2, 5, 6, and 9 that achieved 66,7% for correct percentage and reached 33,3% for incorrect percentage

Figure 3.
Comprehension Evaluation



3. CONCLUSION

Based on the result of the research, the video should be examined by experts to determine its eligibility for use as teaching material for tourism students. The evaluation is divided into three parts. There are three of them: display quality, media quality, and lesson quality. The score for display quality is 86,00%, media quality is 81,33%, and lesson quality is 85,45%. According to interpretations of score criteria, result scores ranging from 80% to 100% are considered excellent. The second survey is conducted by tourism students and consists of two aspects: display quality and material presentation quality. The survey now includes comprehension questions for students' evaluation. The result shows that the percentage of display quality is 86,25 %, while the percentage of material presentation quality is 92,88 %. According to the survey, the video is rated excellent as well based on the interpretation of the scoring criteria. The low percentage of accurate responses for comprehension problems is primarily due to vocabulary and grammar. In conclusion, using YouTube as the learning platform and a video-based learning program to learn

English is very beneficial since it allows students to acquire the information more easily, more interestingly, and more enjoyable by presenting it with animation and sound.

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INCLUSIVE ONLINE LEARNING SUPPORT FOR UT'S STUDENT IN REMOTE AREAS (A CASE STUDY OF PROVIDING A LOCAL HOTSPOT SERVICE IN THE INTERNET BLANK SPOT AREA OF INDONESIA)

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ABSTRACT

This project focuses on providing online learning supports for UT's students living in remote areas. As Internet access is still a privilege for UT's students living in many remote areas of Indonesia, many of them encounter difficulties accessing UT's online services due to lack of a reliable Internet access. This has widened the discrepancies of online learning equality among UT's students. To address this inequality, this project aims at firstly, to develop a local hotspot area to enable UT's students in remote area to access UT's Online support services. This local hotspot service is very beneficial for UT students to give them online learning experiences that are expected to increase their study success. As most of the remote areas have limitations of the infrastructures including power supply and bandwidth, there needs a minimum requirement of the local hotspot services to provide access to UT's Online support services. Secondly, it aims to develop a learning design that needs to be adapted to support a low bandwidth capacity. By using offline Moodle platform service, the online support services are designed with the adaptive features. The adaptive features of the learning management system include discussion forums, feedback of formative tests, student learning progress, and collaborative apps.

***Keywords**: Internet Offline, Local Hotspot, Inclusive Online Learning*

1. INTRODUCTION

Online learning has been a very popular mode of instruction in the last decade. It has become a prominent issue during the pandemic Covid 19 since all instructions have to be converted into online. It is a blessing since then the online instructions enormously developed in particular the supporting technologies to enable synchronous and asynchronous communication in various platforms (Teräs, M., et all, 2020). However, the conceptual and theoretical development of online learning was left behind. One of the prominent conceptual frameworks of online learning that has lasted for a decade is the community of inquiry (COI) theory (Garrison, D. R., Anderson, T., & Archer, W., 2000). The COI seems to be the dominant conceptual framework to consolidate the three major domains of online instructions that are teaching, cognitive and social presences. These three domains of online instruction need to be aligned and integrated into an impressive online learning design to effectively achieve the designated learning goals (Fiock, H, 2020).

In online instruction practices, however the COI framework is quite challenging since the social presence is difficult to achieve. Furthermore when the learning content is not well designed, teaching presence and cognitive presence become troublesome. A major problem of online learning is mainly caused by an improper instructional design that is resulted in low retention and performance (Daryono, 2021; Saniya Khan, 2021). The problems include boredom, low self-motivation, low engagement, technical issues, and insufficient digital literacy (Saniya Khan, 2021). This particularly is evident during the conversion of face-to-face instruction to online instruction during the Covid 19 pandemic. The misconception about online learning that is only perceived as a medium of instruction and the availability of technology deny the importance of instructional design and learning strategies as an imperative requirement of online learning. Responding to the current prevailing issues, the three important factors of effective online learning include student engagement, support, and retention (Daryono, 2021).

This paper discusses the problems in online education and proposes the immersive online learning design. The immersive online learning design adopts the combination of ABC learning design (Online ABC LD, 2021) and ARCS instructional design (Keller, 2010). The ABC learning design provides a practical way to facilitate the integration of the available online learning tools and online learning strategies. A major prevailing problem in online learning is low retention due to lack of motivation (Daryono, 2020) the ARCS learning design will help an instructor to design an online learning strategy to be more motivated and attractive. This combination makes online learning personalized, engaged and motivated.

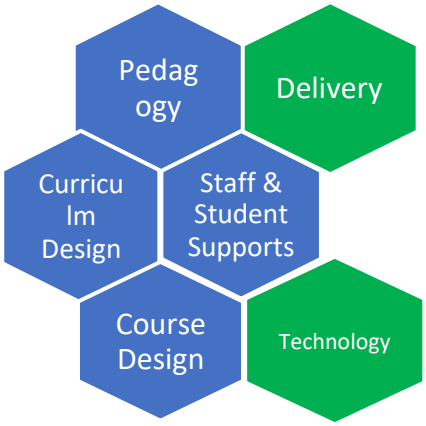
2. IMMERSIVE ONLINE LEARNING DESIGN

A widespread misconception about online learning is found particularly during the pandemic Covid 19 when the residential universities have to convert their instruction into online learning. Online learning is only perceived as converting face-to-face instruction into synchronous online mode by using technology (Teräs, M. et all, 2020). This misconception is commonly due to a lack of understanding about online learning. These have produced diverted results of student's and instructor's satisfaction in online learning. The majority of students and instructors are less preferred to online learning but many of them perceive more benefits from its flexibility, practicality, and interactivity (Belawati and Nizam ed, 2020). These diverted results may be caused by various factors but the unpreparedness, the improper learning design, and cultural disposition may contribute substantially to those conflicting results.

Online learning needs to be prepared in advance to ensure that supporting factors are well organized and arranged. The online learning system design may include the following:

Graph 1.

Online Learning Ecosystem



The preparation of online learning may take more time and effort than face-to-face instruction. The instructional design in online learning is a critical part of how online learning should be organized and delivered within a range of technology availability (Belawati, 2020). In addition, the support system including, staff, students, and technological supports have to be properly in place. The absence of those support systems will most likely affect low retention and satisfaction.

In terms of how the online course should be delivered, the ABC learning design provides a practical way to integrate the learning strategies and the availability of online learning tools. The ABC learning design associates the Moodle learning apps and their plug-in with the learning types as described in the following table.

Table 1.

Matrix Integration of ABC Learning Design and the Moodle Learning tools

Learning Type	Acquisition	Collaboration	Discussion	Investigation	Practice	Production
Learning Activities	Reading, Listening, Watching,	Discussion, Team work, Project,	Discussion Debate,	Explore, Compare, Contrast, Critique	Implement, Doing, Working, Practice	Develop; Create;
Learning Tools	Podcast, Page, File, Video, Ebook. Scorm, URL, Lesson.	Forum, Chat, Wiki, Glossary, Database, Collaborate	Forum, Chat, Hot Question,	Survey. Questionnaire. Library. Search. Forum.	Assignment Quiz, Forum, Workshop, Glossary, Portfolio, Newsfeed;	Glossary, Wiki, Database, Portfolio, Blog;

This matric provides useful tools for an instructor to design the appropriate learning activities with a range of available learning tools on the learning management system in particular Moodle. However, those learning activities and tools could not be able to guarantee that online learning will produce effective results. Saniya Khan, (2021) argued that according to a survey, the majority of the student (77%) found that online learning is much worse than that of class instruction. A similar result is found during the survey conducted by the Directorate of Higher Education in Indonesia to show that majority of students were dissatisfied with online learning (Belawati and Nizam, 2020).

The mixed result regarding the effectiveness of online learning is arguable that the improper instructional design has caused low student retention and performance due to student lack of motivation to learn. The lack of motivation needs to be taken into account by accomodating the motivational-based instructional design. The ARCS instructional design will be best fitted to supplement the ABC learning design by emphasizing the motivational factors of attention, relevance, confidence, and satisfaction (Keller, 2010). The matrix combination of ABC and ARCS learning design is presented in the following table.

Table 2.

Matrix Combination of ABC and ARCS Instructional Design.

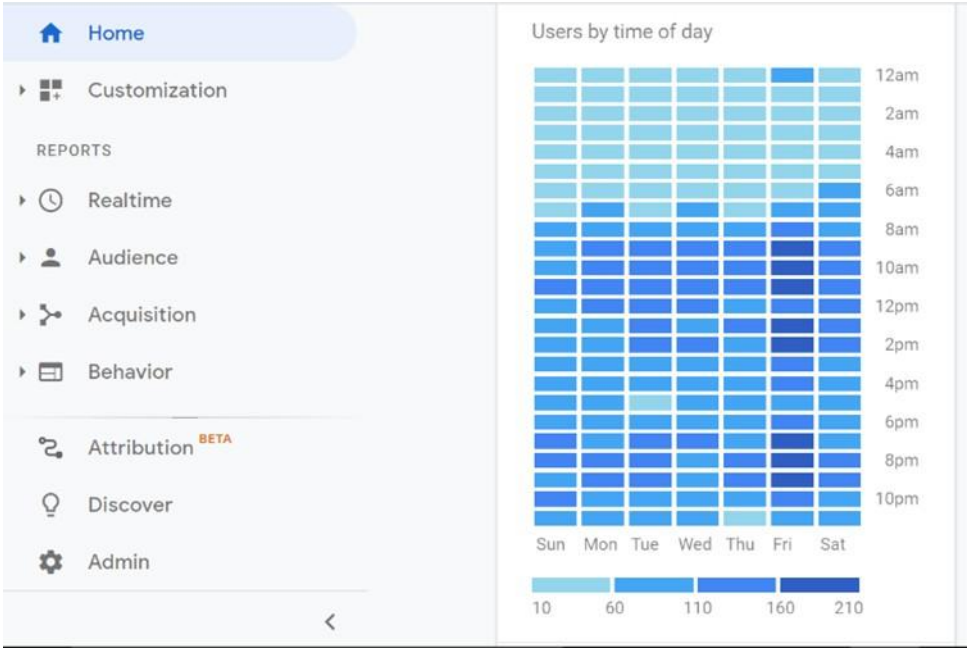
Learning Type	Acquisition	Collaboration	Discussion	Investigation	Practice	Production
Attention	**Variety**	**Active participation**	**Active, participation, Conflict, Case,**	**Variety**	**Real-world examples**	**Real-world examples**
Relevance	**Link to previous experience**	**Choice**		**Modeling**	**Perceived present worth**	**Perceived future usefulness**
Confidence	**Communicate objectives and prerequisites.**	**Give learners control.**	**Provide feedback.**	**Give learners control.**	**Facilitate self-growth**	**Facilitate self-growth**
Satisfaction	**Praise or rewards**	**Praise or rewards**	**Praise or rewards**	**Praise or rewards**	**Praise or rewards, Immediate application**	**Praise or rewards; Immediate application**

The immersive online learning design will create online learning to become more personalized, and attractive due to its flexibility and diversities. Furthermore, the creation of an online social learning space contributes to the expansion of learning into real-world activities. These are elaborated in the following parts.

3. PERSONALIZED LEARNING

One of the important characteristics of online learning is the types of communication and interaction between educators, students, and learning materials that can occur both personally and individually (COI, 2021). Personal in the sense that students can freely interact and communicate with educators and learning materials carried out in accordance with the needs, readiness, and preferences of students. While the individual is the interaction and communication of educators and students and learning materials in 2 (two) directions *in a* person-to-person manner. Personalized learning accommodates both forms of communication and interaction of educators and students personally and individually. This contrasts with offline lectures (face-to-face) that are more public and non-personal (Michael Feldstein and Phil Hill,2016). In addition to the various advantages of online learning that can make learning personalized, some challenges require a new learning approach. One of the challenges is related to "time-space". In personalized learning, time-space becomes unlimited and can be done within 24 (twenty-four) hours for 7 (seven) days a week. This time-space requires special attention considering the difference in time, both based on geographical location and student preferences. From the time used by students to learn and their access to learning materials, it can be argued that almost 24 (twenty-four) hours students access learning activities as shown through Graph 2 below.

Graph 2.
Student Access-Time Profile in Online Learning



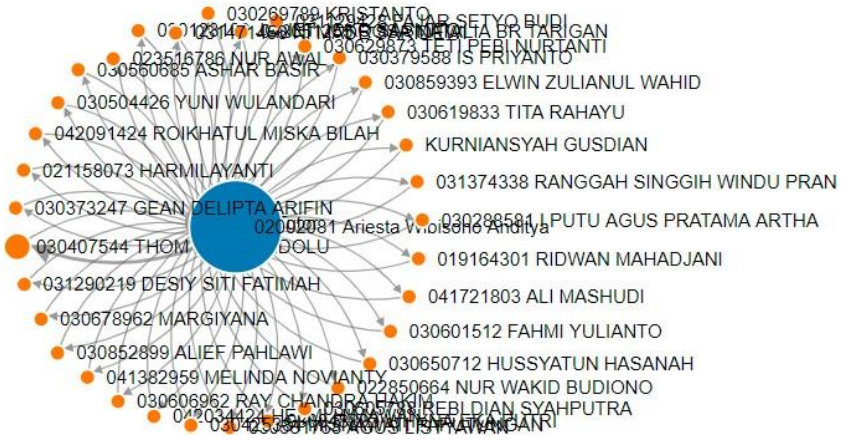
The analytics graph above shows that student activities are distributed evenly from Sunday to Saturday (7-days a week). However, Fridays are most preferred by students to study even though other days have also a fairly high level of access. While in terms of time, most students perform their learning process from 8 am to 10 pm.

The condition related to time-space in online learning is certainly a challenge on how educators and tutors must assertively interact with students so as not to reduce their motivation who post messages or discussions when they study. In online learning, Immediate response is an important reward that may increase their retention and satisfaction. By looking at the time access of students, educators and tutors must be prepared to provide manage their presence in online learning so that students are aware of their presence.

Nevertheless, the student interactions are still merely uni-directional from student to tutor/instructor in the early session. The discussion forum that is expected to impose the interaction among students only consists of student's responses to tutor questions. Tutor is still the main role of interaction as presented in the following graph.

Graph 3.

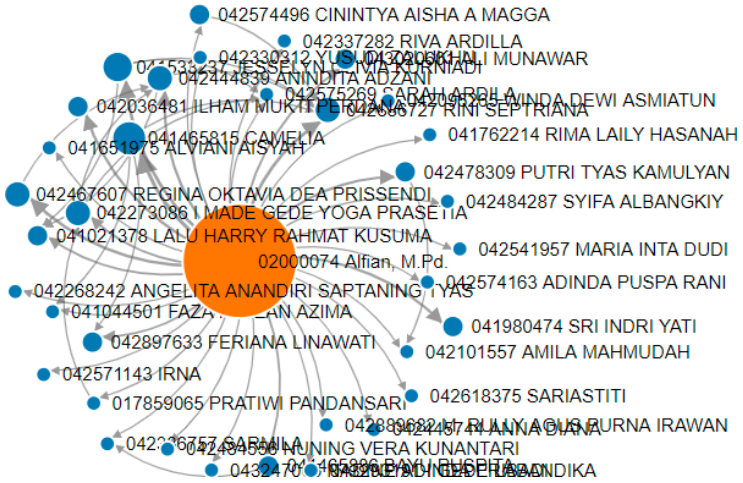
Forum Graph Interaction on the Early Session



In the early discussion forum seems that the tutor plays a very dominant role in assisting the discussion. The pattern of interactions improving during the late session of 7-8 when the students are more eager to respond to the other students' comments. This interaction is seen in the following graph.

Graph 4.

Forum Graph Interaction on the Late Session



In the late session, student interactions become more active and multi-directional. This changing pattern of interaction may be a result of the reward that is given during the last week of each discussion forum. This reward is important to maintain engagement. To retain the student in online learning, the reward of all activities has to be designed including the gamification to give a ranking of accomplishment.

4. ONLINE SOCIAL LEARNING SPACE

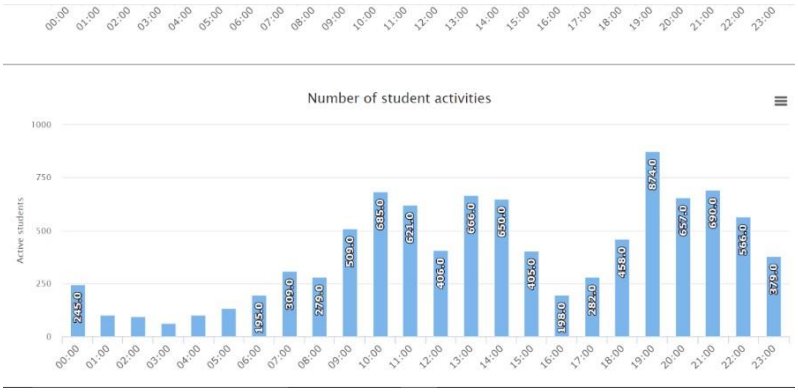
Student activity in online learning is one of the indicators of their success to complete tasks and exams. Empirically the level of online learning activity is not very satisfactory. The engagement and retention of students in online learning is generally less than 50%. This is due to many factors, such as the absence of a "social learning space" that allows interaction and communication between students and students with educators and learning materials, which is one of the factors of low engagement and retention of students in online learning.

Social learning space is a medium that allows students to interact and communicate on a digital platform. During the study from home in the COVID-19 pandemic, student activity was very high. This is driven by the availability of time and activities carried out from home so that student interaction and communication have been able to create a social learning space *(Williamson, A*. and Nodder, C, 2002*).* The existence of a social learning space will improve the learning process. According to the post message activity of students during the COVID-19 period, it shows a high intensity. During the weekend the concurrent users of online learning could reach to seven thousand users.

The high level of learning activities and discussion is a good asset to deepen students' understanding of materials tailored to their preferences. On each day student activity is distributed from 6 a.m. to 12 p.m. as seen in the following graph:

Graph 5.

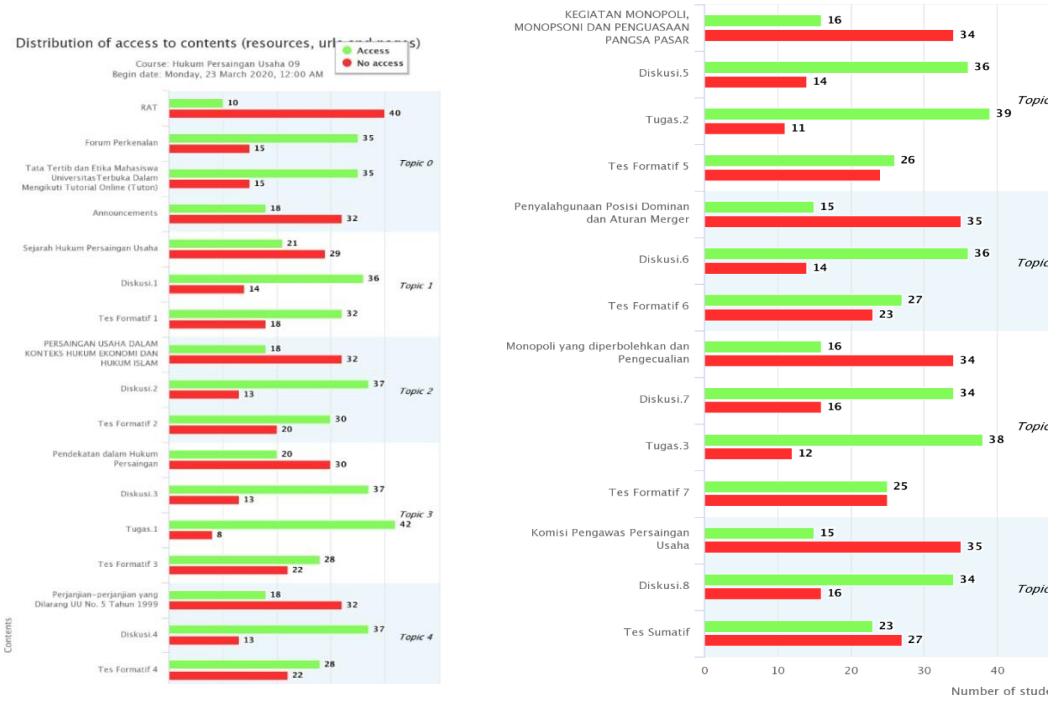
Student Activities in Online Learning



The student activities, engagement, and retention seem not mutually exclusive but it is a result of the reward that is given to the student activities. It is seen in the following graph that the student retains to engage in learning activities when there is a reward that affects the final grade. The student engagements to the assignment (Tugas), formative test (test formatif), and discussion forum (diskusi) are considerably higher than those of learning materials because the assignment, test formative, and discussion are graded by a tutor. The distribution of access to the content is presented in the following graph.

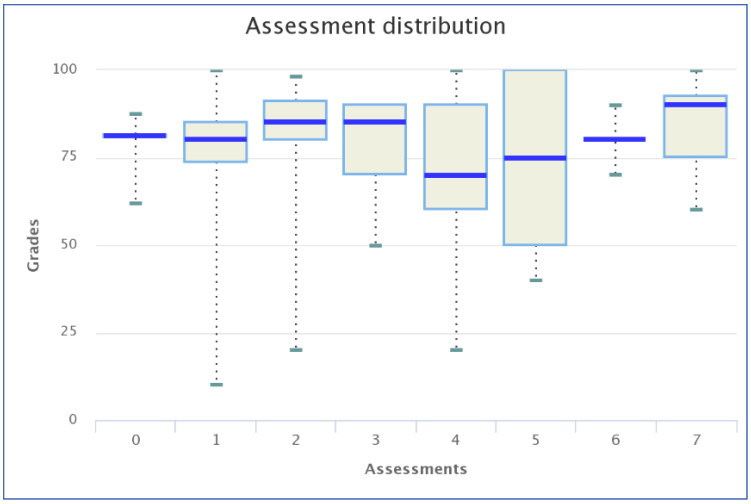
Graph 6.

Distribution of Student Access to the Online Learning Content



Motivational tools inevitably affect retention and engagement. It is therefore that the online learning design requires to provide a reward to all students' activities to maintain their engagement and satisfaction. Student satisfaction may also contribute to higher achievement and performance. The grade distribution of seven graded learning activities is presented in the following graph.

Graph 7.
The Assessment Distribution



Students' engagement and retention may substantially affect higher achievement and satisfaction. To maintain the engagement, the reward needs to be attributed to all learning activities that meet the student's expectations.

5. CONCLUSION

Immersive online learning may not be a single solution for effective online learning, but it provides a constructive tool on how engagement and retention in online learning should be designed. The combination of ABC and ARCS learning design addresses the prevailing problems in online learning that lack motivation due to improper instructional design. In addition, effective online learning requires a certain level of digital competence that allows students and educators to interact and communicate optimally using digital platforms. The use of various relevant learning tools is expected to increase student retention to form a social learning space. Along with this journey, pedagogical principles must also be adjusted to allow multi-faceted learning and active participation in the real world.

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2021 International Conference on Innovation in Open & Distance Learning (2022 INNODEL)

THE ROLE OF E – LEARNING IN EQUITY BETWEEN FULL – TIME MOM AND HUSBAND, IN ENHANCE A FULL – TIME MOM EDUCATION.

Retno Wulandari

Indonesia

ABSTRACT

A full-time mom has huge roles for her family, sometimes there are no break times to catch another chance to enhance her skills in the case when the children getting bigger a full- time mom is ready to continue her career. Getting her masters' degree in education is one of the aspects that she can do to improve her ability, even if the purpose of a full-time mom's education is not just for that, the biggest impact is to prepare for taking care of children herself. Although the time and opportunity for doing those things can't get like before, she has a responsibility for her family. The Open University's E-Learning program has a huge contribution for full-time-mom who still desire to complete their education wish. It proves to us that build a family can complete each other position between wife and husband due to the support, so the equity between a couple will be fulfilled in every role. Another advantage of The Open University's E-Learning is that almost all total payments are very economical, in addition to quality that is prioritized. This abstract is preferred written in qualitative writing research and secondary source. Secondary sources based on articles on the internet and qualitative methods because the research method is written descriptively. We changed the research method from primary using secondary because we prefer using accurate articles from internet that written by experienced source. The Open University's E-Learning proves to us that the program is capable of complying with a fulltime-mom who desires to complete her education by doing tasks in it during free time at home. Expertise in dividing time is certainly needed regardless of not being a housewife, though. Sometimes working on tasks in e-learning can be a 101 me-time method to release the stress of taking care of the family. All genders are entitled to complete all their wishes, especially at the education level of a full-time mom who doesn't have chances like before. So the online and technology in education has a big impact to complete equity between men and women.

Keywords: *Universities, Qualitative Research, Educational Status, Learning, Employment, Technology, Writing*

1. INTRODUCTION

According to the Big Indonesian Dictionary (KBBI), a housewife is a woman who oversees the fulfillment of many types of home duties (not working in the office).

Housewives are women who spend a lot of time at home and devote their time to caring for and taking care of their children in accordance with the general public's pattern(Dwijayanti, 1999, p. 32).

It is not impossible for a full-time mom to plan to keep her work when their kid grows up for a variety of reasons, such as wanting to contribute with family money or intending to continue her career after the child is old enough and independent. One ofthe preparations they will take to continue their careers is to prepare skills with various courses and studies, not because of the demands in the competitive world of work, but because improving the quality of women should automatically be formed in terms of parenting for children, such as being digitally literate parents.

RA. Kartini is the inspiration and driving force for the equality of men and women in Indonesia. A mother, according to Kartini, bears a heavy load. According to Kartini, a woman is faced with a large responsibility of educating children and caring for the home, especially if the mother also plays a big part in a family gaining financial support. "It is not only schools that must teach children's spirits, but also, and especially, family connections! Schools educate the mind, but home life should shape the child's character! "Kartini stated.

The family is society's smallest unit, consisting of a man and a woman who are married. In society, there is a picture of a family consisting of a father, mother, and children. According to Abu Ahmadi (2008:108), family is a highly significant forum among people or groups since it isthe first social group into which children are born. Parental educational attainment can influence several elements of a child's well-being, including health and health-related behaviors, school readiness, educational accomplishment, and engagement in pro- social activities.

Children of parents without a high school diploma are more likely to suffer in school, including getting

Despite the fact that parental education is a well-established predictor of children's educational and behavioral results, some research continue to question the relationship between mothers' education and its effect on children's education (Behrman & Rosenzweig, 2005). According to these experts, increasing women's education does not automatically help their children's education; rather, mothers' education diminishes home time for mothers with their children (Behrman & Rosenzweig, 2005), negatively affecting their educational attainment. According to research, children of young moms with low levels of education do better on academic competence tests (Magnuson, 2007).

In this day and age, the generation of moms in Indonesia is truly grateful since they are increasingly given the convenience of accessing something that may develop their inner potential, both formal (educational level) and informal.

2. METHODOLOGY

In this study, the type of research used is a qualitative research type, which isa type of research that seeks to understand the symptoms in such a way by denying all things that are quantitative in nature, so that the symptoms found are not possible to be measured by numbers, but through logical theoretical interpretations. applies or is formed just like that because of the new reality, which is a significant indication of the creation of a new concept. Saebeni,(2008: 90-91).

Types of data obtained in qualitative research there are two types of data, namely primary data and secondary data (Sugiyono, 2008:225) as follows:

This research uses qualitative writing approaches along with secondary sources drawn from accurate articles and trusted sources that are relevant to the topic and title of this paper, such as:

Dyan Afriana Ayu Puspita, a vocational school teacher and housewife, explained why she chose the Open University as a fix solution to pursue her education in an article published on the news website mojok.co.

3. FINDING AND DISCUSSION

Indonesia is able to achieve the aspirations of many housewives who wish to formally level up their education levels (through undergraduate and postgraduate graduates) and many other certified courses through the role of the Open University.

Dyan Afriana Ayu Puspita, a vocational school teacher and housewife, explained why she chose the Open University as a fix solution to pursue her education in an article published on the news website mojok.co:

a) Tuition expenses at UT are quite low, even lower than the price of a smartphone in Indonesia, which ranges between Rp.1,300,000.00 and Rp. 1,800,000.
b) The flexibility of the learning method provided by UT is the Face-to-face Tutorial (TTM) and the employee class (Saturday &Sunday), but he chose the Face-to-face Tutorial because the learning method he chose did not sacrifice his domestic affairs as a housewife in taking care of the house and everything in it.
c) Because UT offers a variety of education majors, Mrs. Dyan Afriana Ayu Puspita selects the study option that best suits her interests, especially English education. Mrs. Dyan Afriana Ayu Puspita continues to carry out her job in taking care of the household and studying in a balanced way because of the ease that UT provides for students, particularly like she only goes to campus during exams.

Another story from Novia Wahyudi, a housewife and UT student studying in Accounting in 2010. Initially, he studied at UT by attending face-to-face lectures, but once e Learning or online tutorials became available, Novia took advantage of them to help him with his studies at UT Jakarta. For her, getting into UT appears simple, but don't expect her to finish her studies at the state institution quickly. Even Novia found it challenging to obtain grades with an A index. Getting good grades at UT 1 was the solution. Follow the tutors on a regular basis.

4. CONCLUSION

Despite the fact that parental education is a well-established predictor of children's educational and behavioral results, some research continue to question the relationship between mothers' education and its effect on children's education (Behrman & Rosenzweig, 2005).

According to research, children of young moms with low levels of education do better on academic competence tests (Magnuson, 2007). In this case, the Open University is able to realize the ideals of housewives in realizing an increase in the level of education. career after the child is independent, to helping meet the financial needs of the family with education, it is hoped that they will be able to get a prestigious job. In this study, the type of research used is a qualitative research type, which is a type of research that seeks to understand the symptoms in such a way by denying all things that are quantitative in nature, so that the symptoms found are not possible to be measured by numbers, but through logical theoretical interpretations. applies or is formed just like that because of the new reality, which is a significant indication of the creation of a new concept. Based on the author's personal experience, such as:. 1) Tuition expenses at UT are quite low, even lower than the price of a smartphone in Indonesia, which ranges between Rp. The flexibility of the learning method provided by UT is the Face-to-face Tutorial (TTM) and the employee class (Saturday & Sunday), but he chose the Face-to-face Tutorial because the learning method he chose did not sacrifice his domestic affairs as a housewife in taking care of the house and everything in it. Dyan Afriana Ayu Puspita selects the study option that best suits her interests, especially English education. Even Novia found it challenging to obtain grades with an A index. Follow the tutors on a regular basis.

5. ACKNOWLEDGEMENTS

Thank you to my parents, no matter how big their children's mistakes are, they forgive me, they continue to support me in all forms of financial and non-financial. Thank you Allah SWT for giving me the opportunity to study and breathe until this moment.

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2021 International Conference on Innovation in Open & Distance Learning (2022 INNODEL)

AUGMENTED REALITY: NEW APPROACH IN DISTANCE EDUCATION STUDENTS' LEARNING PROCESS

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ABSTRACT

There are several practical courses in the Educational Technology Study Program of Universitas Terbuka which are offered fully online. In these courses, students face some difficulties to reach learning objectives. This study aims to provide media and adequate learning experience for distance education students by using augmented reality. Research and Development design using ADDIE model applied in the study. The results showed that augmented reality media in online tutorials was quite effective in providing learning experiences. Even so, students still face obstacles in using the media, namely the incompatibility of student devices gadgets with the media, and minimal tools to produce instructional video program. A synchronous learning support between students and tutor is required. Augmented reality can bring reality into classroom for distance education students and assist them practice their courses.

Keywords: *augmented reality, ADDIE model, online learning, students learning guide*

1. INTRODUCTION

The Educational Technology Study Program has 6 practical courses, Three-Dimensional Simple Media Production, Learning Web Design, Television Broadcasting Management, Video/Television Media Production and Audio/Radio Media Production. All these courses provided fully online.

The results of the initial analysis showed several characteristics of students, namely, 1) Students were spread unevenly across 20 regional offices with varying numbers. This condition makes it difficult for students to be able to practice in the city they live in because of the regulation that the practice is done at least with the number of 15 students per city, 2). The age of students between 20 - 35 years as much as 70%, who are familiar with technology, attached to gadgets, spend more than 4 hours / day doing activities with the internet, and 3). Students are adults who have worked so it is difficult to practice / intern at a television station or production house in a period between 1 to 2 weeks.

This research is aimed at answering problems 1) what learning media are appropriate to provide a practical learning experience to help students learn in distance education and 2). How appropriate learning design is used for practical courses.

One form of technological benefits that are able to provide real experiences to users is artificial intelligence technology (AI) in the form of augmented reality (AR). Augmented Reality (AR) is defined as a technology that combines 2D and 3D virtual objects into a real environment and then projects them in real time (Roedavan, 2014).i This technology is widely used in business/marketing (Flavian, Sanchez & Orus, 2019; industry (Berg & Vance, 2016); health (Freeman, et al., 2017) and dnaturein education (Merchant, Goetz, Cifuentes, Keeney-Kennicut, & Davis, 2014); Khan, Johnston & Ophoff (2019); Cabero & Barroso, 2016), Yuliono, Sarwanto and Rintayanti, 2018) and Pramono & Setiawan (2019).

Research on the use of AR in Indonesia is quite a lot done, among others, in the field of science, early childhood education and the field of design. Some of these studies include the use of artificial intelligence-based technology in the form of Augmented Reality (AR) Apriyani & Gustianto (2015); Irwansyah, Yusuf & Ramdhani, (2017).

In the context of distance education, research onthe utilization of AR media in distance education learning (PJJ), has not been widely done, as has been reported by Coffin, Bostandjieh, Ford, &hollerer, 2008); Nielsen, Brandt & Swensen, 2016); Lytridis, Tsinakos & Kazanidis, 2018); Viscione & D'elia, 2019, and Saykili, 2019).

Considering the competence of the courses, the distribution and number of students in various regional offices and student characteristics, this research is directed at the development of augmented reality media. This medium has great potential to help students perform course practice assignments in remote education. AR Media will be integrated in online tutorial applications in Video/Television Media Production courses.

Currently, the learning experience given to students in the course is self-study by reading modules, online learning through LMS Moodle, which consists of reading materials, responding in discussions, making assignments, doing formative tests, conducting practices and working on final tests. There is no learning media that supports student practice work. Practice guidance is done through asynchronous online learning.

Augmented Reality media development for Video/Television Media Production Courses is carried out with an Analyze-Design-Develop-Implementation-Evaluation (ADDIE) approach/model. This process is referred to as Instructional System Design/ISD (Branson, 1975). This model can also be applied to curriculum development activities, learning media development or other learning program development. Here are the details of ADDIE model activities in this study.

Analysis /Analyze – Collecting information about the targets of learners who are targeted by AR media, including analysis of geographical conditions, student location, rank owned by students, course assignments, and course materials. The team involved is an instructional expert, namely the lecturers of the Open University Educational Technology Study Program and the functional personnel of Learning Technology Developers. The next step is to analyze and identify media needs for AR media, for example whether it requires video, audio, or multimedia.

Design /Design - Designing course tasks and doing tasks to make them easier for students to do. From this step is also designed learning activities that will be given to students. Products of this stage are AR media scripts, material concept maps and story boards.

Developing/Developing – Producing AR media programs, involving programmers and learning media developers. Products of this stage are 4 AR programs namely Camera, Tripod, Audio and Lighting. Formative evaluation of AR media is carried out during the development process, involving lecturers and Learning Technology Developers.

Implementing /Implement -Implementation of AR in the student learning process through online learningwith Moodle platform. Because of the short development time, there has been no trial, so ar media field trials directly in online classes in March - June 2020. At this stage, media development tests all AR media tosee if the media is working and suitable for the intended audience. This field trial yields input on the pedagogical and technical aspects of AR media.

Evaluation /Evaluate – Evaluation of AR media is also carried out by students in online learning.

2. METHOD

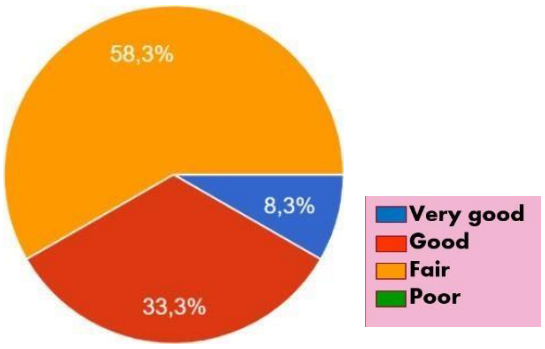
The design of this research is Research and Development, using the ADDIE model (Analyze-Design-Develop- Implement-Evaluate). Research is focused on the development and utilization of AR media by Educational Technology students in online learning. The method used is a one-shot case study experiment, to find out the effectiveness of AR media in the actual classroom, namely in online learning.

The population of this study are students and tutor of Video /Television Media Production, Educational Technology Study Program in 20 regional offices. The sample is determined purposively, which is taking students of the Educational Technology Study Program who register for video / television media production courses in the semester 2020. Data collection is done with Google Forms questionnaires to students and tutors, followed by telephone interviews to students and tutors. The study was conducted in March - June 2020 and September - November 2020. Telephone interviews were conducted by students from 8 regional offices namely Pangkal Pinang, Palembang, Bandar Lampung, Jakarta, Bogor, Semarang, Surabaya and Pontianak. An descriptive analysis is done to interpret the collected data, to be further presented narratively in the discussion of research results.

3. RESULTS AND DISCUSSION

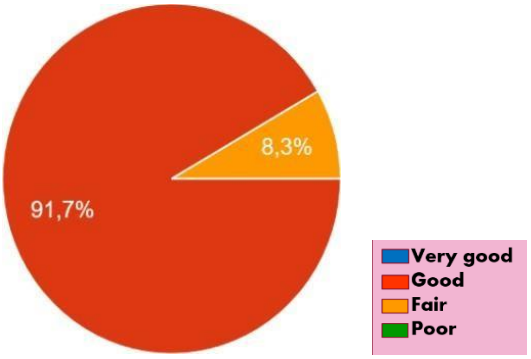
This research generated input related to the level of difficulty of students in understanding the material and doing tasks in this course, 58.3% of students stated that the difficulty level of this course is quite high, 33.3% stated that this course has a high level of difficulty. Technical difficulties such as difficulty opening web-based applications, require large HP memory, while gadget devices owned by students are standard devices, and minimal production tools such as gadgets, simple tripods, AR / VR glasses. There are a lot of students who don't have these devices. However, 8.3% of students think the course is not difficult for them because they have access to standard production equipment, such as those borrowed from schools.

Figure 1
Student Opinions About The Difficulty Level of The Course



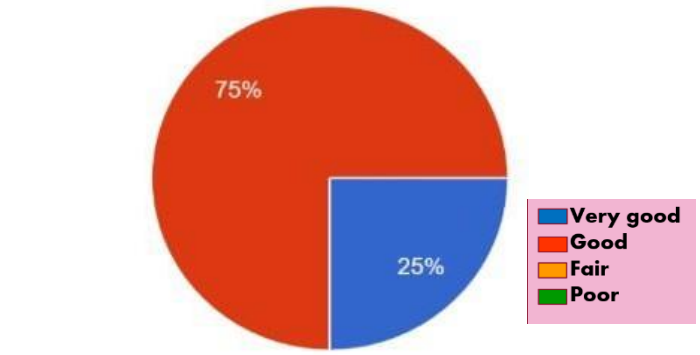
Regarding students' perception of their ability to understand course materials, the data showed that they can absorb the material well, stated by 91.7% of students. This can be interpreted that the competencies demanded in this course can be well received by students.

Figure 2
Student Opinions About The Level of Ability to Understand Material



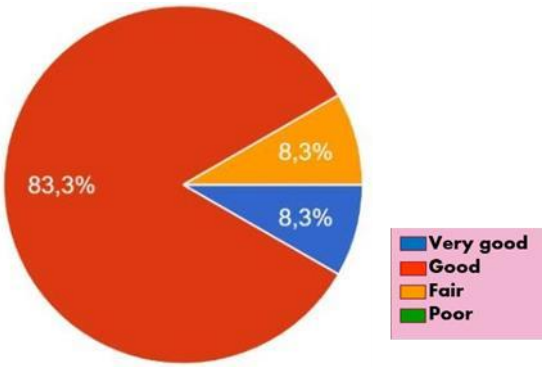
Regarding the suitability of AR media to the achievement of subject competencies, 25% of students think that AR media used in courses is less in accordance with the competence of the course, and 75% of students state that AR media is appropriate for the competence of this course.

Figure 3.
Suitability of AR Media with Learning Objectives



About the ability of students in using AR media, 8.3% of students stated that their ability is very good in using AR media, while 83.3% of students stated their ability both in using AR media and another 8.3% they are quite capable of using AR media. AR media in the course is designed to provide a learning experience that is in accordance with the competence of the course. To that end, students are expected to be active in self-study through modules, AR media and other sources that they can find themselves.

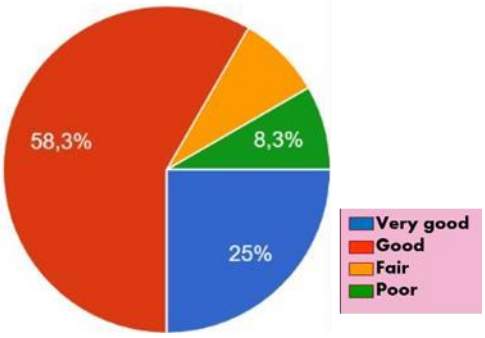
Figure 4.
Student Opinions on the Ability to Use AR Media



The activeness of students in using AR media in this course is described by 25% of students who stated they are very active in doing practical tasks and 58.3% of students who state they actively use AR media during the course, while 8.3% stated that they are not actively using this AR media. The inactivity of students in doing practical tasks is caused, among others, because they do not have tools as depicted in the teaching materials module. In addition, there are also network constraint factors and limited tool constraints. In addition, they also need

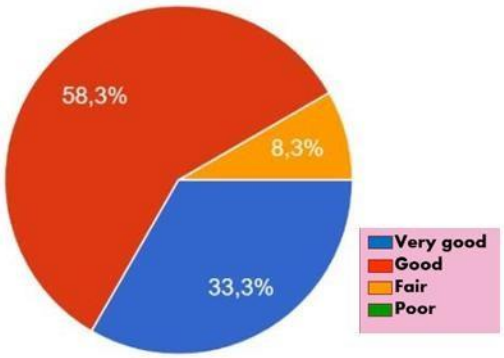
discussions with lecturers / tutors and colleagues in learning, to discuss about course tasks

Figure 5.
Student Opinions About Activeness Doing Practical Tasks



Related to the allocation and determination of time to do the task, students provide input so that the course assignment should be divided more evenly the time of work, so that they have the opportunity to do the task with sufficient time. Currently they argue, the course assignment as many as 7 tasks are still too close to the time 1 with the others. Nonetheless, they argue the time to do the task is sufficient.

Figure 6 –
Student Opinions on Task Time Allocation



Although it has been supplemented with Practice Guide, students argue that these practice guidelines have not fully helped them understand coursework. So that they need to have online synchronous guidance for consultation sessions through applications such as Zoom, Google Meet or other applications. This is also asked by students so that they can get to know their lecturers better. The Study Program needs to improve design of the course in the following semester, including improving AR media and its devices to make it more accessible to students.

4. CONCLUSION

Augmented reality media for practicing courses is quite effective in providing a learning experience to students. This finding is in line with the previous research done by Nielsen, Brandt & Swensen (2016) and Saykili (2019). AR media also enhance students motivation in learning as indicates by Mustaqim's findings (2016), Khan, Johnton & Ophoff (2019) that the utilization of AR media can increase students' interest and motivation in learning due to the nature of Augmented Reality that combines virtual world that can increase the imagination of learners with the real world directly.

Nevertheless, students still face obstacles in using AR media. The biggest obstacle experienced by students is the incompatibility of student gadget devices with AR media, which causes students not entirely able to utilize the media to learn. In addition, they also do not have the minimal tools needed to produce a learning video program, such as tripods, lights for lighting. The results of this study show that the learning experience conducted through a full network (fully online) is perceived as not adequate to achieve the learning objectives of the course. Students need to have synchronous guidance to discuss assignments, as well as they need to communicate with other students and lecturers.

Limitations of this study are that the sample in this study is very limited because the number of students who took courses was 26 people and who responded to answer questionnaires as many as 12 people. For this reason, advanced studies are needed to test the effectiveness of AR media in practical courses with adequate number of sample.

5. ACKNOWLEDGMENT

High appreciation was presented to the team of researchers from the Education Technology Study Program of FKIP Universitas Terbuka, Learning Technology Developers of Universitas Terbuka and Learning Technology Developers from Data and Information Centers, Ministry of Education and Culture, who have been directly involved as AR media developers.

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THE ROLE OF THE UNIVERSITAS TERBUKA'S ONLINE TUTORIALS TO HELP EARLY CHILDHOOD EDUCATION STUDENT TEACHERS LEARNING DURING THE PANDEMIC COVID 19

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ABSTRACT

This paper explains how the provision of online tutorial in Universitas Terbuka (UT) can help UT's students such as the Early Childhood Education (ECE) student teachers learning at UT. During the pandemic Covid 19, students cannot meet face to face with their tutors since it is dangerous. Therefore, the provision of UT's online tutorials which can give a chance for the students to have the asynchronous learnings with their tutors or instructors can be considered very important. In this paper, it is explored how the ECE student teachers can still meet and learn by participating in online tutorials. UT's online tutorials have been planned carefully in order to help all UT students including the ECE student teachers to learn actively. Therefore, without meeting with the tutors directly, the ECE student teachers can still learn by reading the learning materials, participating in the discussion sections and answering the assignments.

Even, ECE student teachers can also interact indirectly with their online tutors and their fellow students using the chat room or by sending emails or by using whatsap (WA). By joining and participating in the online UT tutorials, students are directed to better understand the subject matter of their printed modules and also the students are instructed to be online learners. This article is the result of research conducted by researchers to investigate how the opinion of UT's ECE student teachers about the online tutorials they joined, and how the online tutorials can help them learn. In addition, in this study, the researcher tries to explore how participating in online tutorials can help UT's ECE student teachers become more active in their learning. The research method for this study used a simple quantitative-qualitative descriptive approach using a questionnaire which sent online. The results of this study are 1. Participating in online tutorials turns out to be the right way to help students learn without attending the tutorial venues, 2. Participating in online tutorials helps UT's ECE student teachers to be more active in their learning and 3. By studying online, students learn to familiarize themselves with computers and the internet.

Keywords*: UT, ECE student teachers, online tutorial, asynchronous learning*

1. INTRODUCTION

As the 45th state university in Indonesia, the Open University (UT) has implemented government policies for higher education since UT was founded in 1984. As stated on the UT website (https://www.ut.ac.id/en/brief -history) it is stated that the Open University (UT):

"Fully using distance education learning mode. Since its inception, UT has been designed to be a university serving people who do not have the opportunity to follow the face-to-face mode of higher education due to various constraints, including lack of funds, living in remote and rural areas, and working as well as other commitments. The UT system is constantly evolving and improving in terms of its teaching and learning systems, management and support services for students".

There are big changes that are happening in many aspects of our lives today, as well as the spread of the covid 19 virus that has spread throughout the world, of course, it also has an impact on learning activities that occur in Indonesia. Changes have affected our lives such as the way we relate to each other and the way we learn (Basar, 2021, Bates, 2015). The rapid changes in technology and the Covid virus disaster that is dangerous for everyone certainly affects all aspects of our lives, including influencing the Indonesian government's policies, including in the field of education.

This paper was written to describe the extent to which UT's Early Childhood Education student teachers think about online tutorials and to explore how online tutorials can help them stay focused while studying with a distance learning system. In addition, this study also seeks to find out the opinions of students about the importance of them following UT online tutorials and how the benefits of participating in the distance learning process via the internet as they experience in online tutorials. In addition, in this study, the researcher tries to explore how following online tutorials can help UT students to be more active in learning.

- Indonesia's policy for higher education in the industrial revolution 4.0

  The rapid development of technology is realized by the Ministry of Research and Technology and Higher Education. Therefore, when there was a National Working Meeting (Rakernas) held in early 2018, the Minister explained that:

  "The world is now entering the era of the industrial revolution 4.0 or the fourth world industrial revolution where information technology has become the basis for human life. Everything becomes limitless with unlimited computing and data usage, because it is influenced by the development of the internet and massive digital technology as the backbone of the movement and connectivity of humans and machines. This era will also disrupt various human activities, including the fields of science and technology (science and technology) and higher education (https://www.ristekdikti.go.id/pengembangan-iptek-dan- Pendidikan-tinggi-di-era-revolution - industry-4-0/)"

Furthermore, the minister of the Ministry of Research and Technology and Higher Education stated that there are five important elements that must be considered to enter the 4.0 Industrial Revolution era, namely:

a. Developing more innovative learning systems at universities such as adjusting learning curricula, and improving students' abilities in terms of Data Information Technology (IT), Operational Technology (OT), Internet of Things (IoT), and Big Data Analytics, integrating digital physical objects and humans to produce competitive and skilled university graduates, especially in aspects of data literacy, technological literacy and human literacy.
b. Reconstruction of higher education institutional policies that are adaptive and responsive to the industrial revolution 4.0 in developing transdisciplinary science and required study programs. In addition, the Cyber University program was initiated, such as a distance learning lecture system, thereby reducing the intensity of lecturer and student meetings. Cyber University is expected to be a solution for the nation's children in remote areas to achieve high quality education.
c. Preparation of human resources, especially lecturers and researchers and engineers who are responsive, adaptive and reliable to face the industrial revolution 4.0. In addition, rejuvenation of infrastructure facilities and development of education, research and innovation infrastructure also needs to be carried out to support the quality of education, research and innovation.
d. Breakthroughs in research and development that support the Industrial Revolution 4.0 and the research and development ecosystem to improve the quality and quantity of research and development in Universities, Research and Development Institutions, LPNK, Industry and Society.
e. Breakthrough innovation and strengthen innovation systems to increase industrial productivity and increase technology-based startup companies". (Read more at https://www.ristekdikti.go.id/pengembangan-iptek-dan-dunia-tinggi-di-era- revolution-industri-4-0/#EBFIthMvYyOw03aI.99)

- Open University (UT)

  UT is a public university that was established in 1984. UT is a university that uses a distance learning system. As a university that uses a distance learning system, UT always uses various technologies to help students study remotely. Therefore, UT students are directed to become students who can study independently and can use technology as an aid for their learning. All lessons designed and implemented at UT have been designed as well as possible to fit the planned learning objectives.

- Early Childhood Education (Ece) Student Teachers

  At UT, there are 4 faculties, namely the Faculty of Science and Technology, the Faculty of Law and Social Sciences, the Faculty of Economics and the Faculty of Teacher Training and Education (FKIP/Faculty of Education). To become a FKIP student, the prospective student must have become a teacher. One of the study programs at FKIP is the Early Childhood Teacher Education Study Program (PGPAUD/ECE program). PGPAUD students are Kindergarten or PAUD teachers. They are PAUD teachers who have at least 1 year of teaching experience.

- UT ONLINE TUTORIAL / TUTON

  In fact, UT has provided several services to help UT students study at UT, such as face-to-face tutorials, online tutorials, radio tutorials, and television tutorials as part of UT's learning support. However, this article will only review online tutorials, although, it is clear that face-to-face tutorials are the most preferred tutorial mode by students, especially students majoring in basic education (Chandrawati, unpublished 2016 research report).

  At UT, tutorial are provided for several reasons, such as for courses that do not have face-to-face tutorials. There are also several programs at UT that use online tutorials or tutons for all their learning activities. Generally, tuton is done for eight sessions or eight weeks (two months).

  Currently, online tutorials are offered for many courses in all courses. All students can participate in online tutorials. During the tutorial, students can discuss with tutors and other students both synchronously and asynchronously (https://www.ut.ac.id/en/tutorials).

  Students can get more information about UT services through the UT website, www.ut.ac.id. In addition, as a UT student, early childhood educator or teacher can register to participate in tuton. One thing students should know if they want to join and participate in online tutorials is that students must have an email address with their username and password. It is recommended that students should have a Gmail email address to participate in online courses more easily.

  Tuton will be given in eight weeks. Each week students have to study one initiation and one topic of discussion. Assignments will be given in the third, fifth and seventh week. Thus, there will be eight learning materials, five to six discussion topics and three assignments. In participating in tutoring, students can have dialogue in online discussions (questions and answers) with online tutors and with fellow students.

  The interaction between students and their tutors can be considered as a learning process for UT students, apart from reading the printed learning materials (modules). Students can have dialogues with their tutors, their colleagues, or the subject matter modules. Participating in online tutorials will contribute 30% to a student's final grade.

  The provision of online tutorials for PAUD started in 2007/2008. However, at that time only a few students who were also PAUD teachers (student teachers) participated in online learning. In 2013 more PAUD teacher students took online tutorials. In 2018 UT PAUD teacher students who took online tutorials, especially in the PAUD Teacher Professionality course (PAUD4405), also experienced an increase in number. Even because of the spread of the Covid 19 virus, which made it impossible for everyone to meet face-to-face with other people, the number of students taking tutoring in the January-June 2020 semester also increased. Students who take tutoring also look more active in that they actively answer the discussion topics given for 8 weeks and they are also active in sending answers to assignments 1, 2 and 3. Another thing that has changed is that active students also send messages to the tutor if the tutor does not immediately assess the answers to the discussion and the answers to the task.

Online tutorial (tuton) is a form of online learning that uses the Moodle LMS which is sourced from open source and developed according to the needs of UT (Darojat, et al, 2018). Online tutorials are provided to assist UT students in understanding their subject matter while studying independently. In online learning, students can study at their own place without leaving their class or family and on their own time.

Learning activities through tuton are carried out in eight initiations and three assignments for each course per semester. Each tutoring class is held by a tutor. The number of students in each class is between 20-50 students per class.

In fact, rapid technological progress is very beneficial for UT because it can help UT to be able to continue to change and improve itself through change or innovation, to improve all aspects of its services. UT uses technology in response to changing demands by clients and stakeholders such as UT students (https://www.ut.ac.id/en/brief-history). The use of distance learning systems is in dire need of technological assistance. At UT, technology is used to manage all activities and learning systems, for example in providing online teaching and learning processes called online tutorials (online tutorials or tutons).

- Independent Learners

  Given that being a UT student means that students have to learn independently because every day UT students do not meet directly with their lecturers or lecturers, UT always tries to help students to stay connected with UT through participation in tutoring. Or in other words, online tutorials are provided to help UT students understand lecture material while studying independently. By participating in online learning, students can study in their own place without having to leave the class or their families and can manage their study time according to their own time even though it is still within the time limit determined by UT.

- Asynchronous Learning

  Asynchronous Learning (ASL), which is an online learning process that provides teaching materials and indirect assignments (https://aptika.kominfo.go.id/2021/02/synchronous-dan- asynchronous-learning-inovasi-learning-daring- friend-deaf/).

  In asynchoronous learning, communication is done asynchronously. That is, the lecturer provides material that can be used as a reference for students. The material can be re-studyed by students in the form of PPT files, PDFs, or videos (https://sevima.com/beda-komunikasi-daring-sinkron- dan-asyncron-berserta-sample/).

  Independent learning or commonly known as self-directed Asynchronous Learning is independent learning that can be done by students anywhere and anytime according to their respective conditions and learning speed (https://sevima.com/beda-komunikasi-daring-sinkron - and-asynchronous-with-examples/).

  HOW PARTICIPATING IN ONLINE TUTORIALS CAN HELP UT PGPAUD STUDENTS FOR THEIR ONGOING PROFESSIONAL DEVELOPMENT.

To help students improve their employability and help become citizens who can adapt to the changes taking place in the 21st century, the professional development of teachers in every country should include various methods to increase the effectiveness of teachers and schools as expected. In addition, changes should also focus on transformational strategies to develop deeper forms of content, new pedagogical models, and partnerships of educational organizations to learn together with parents, business challenges, and community institutions" (Dede, 1998, in Vrasidas & Glass). , 2004, p.xii).

The professional development of teachers can be seen as an important factor to move education towards a better future. According to Vrasidas & Glass (2004, p.2-3) some characteristics of effective professional development can be seen when students are actively involved in meaningful activities and when they reflect critically on what they are doing. These characteristics can also be used in the professional development of teachers. To develop effective professional development for student-teacher, it is believed that we need to move our teaching and learning process towards a pedagogical model that values interaction among students, the social nature of learning, societal change, and reflection in the implementation of teaching practice. In distance education settings, this change will change the traditional learning that is always used by distance education institutions, namely changing the use of learning materials or activities that ignore interaction between students and tutors into a learning activity that can increase interaction between students and tutors.

Online learning in distance education can be divided into asynchronous and synchronous. Conducting synchronous learning or meeting face-to-face although virtually is a bit difficult compared to asynchronous. It is difficult to conduct synchronous online learning because all participants have to set the same time so that they can meet each other in person. Therefore, in UT online tutorials, asynchronous online learning programs are more often used.

In addition, the dialogue approach in online learning programs is expected to be applied to become an effective teacher professional development (Chandrawati, thesis, 2015). Online programs can also help students who want to study anywhere, anytime (Vrasidas & Glass, 2004, p.4). Professional development can help address deficiencies that may have been part of teacher education and keep teachers using new knowledge and practices in the field (UNICEF, 2000). It should be noted that in learning activities, dialogue and reflection with colleagues, peer and supervisor observations and journaling are effective ways for teachers to increase their knowledge (UNICEF, 2000) at http://www.unicef.org/education/ files/QualityEducation. PDFs).

UNICEF (2000) also writes that an example program in Kenya, the Mombassa School Improvement Project, builds on this approach to professional development and shows that teachers supported by on-site training as well as external workshop training significantly improve their ability to use learning behaviors. - Child-centred teaching. practice. In distance education settings, this change will change the traditional learning that is always used by distance education institutions, namely changing the use of learning materials or activities that ignore interaction between

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2. METHODOLOGY

This study uses a quantitative and qualitative descriptive approach because it uses a survey with an online questionnaire with a google form from the first week of June 2020 to the third week of June 2020. The contents of the questionnaire are closed and open questions that respondents can answer online. Questionnaires were distributed to groups of students who were known to researchers, namely those who followed the PKM Tuweb, Physical Development Methods, and tutors in subjects including ECE teacher professionalism, Strategy for Development Activities in Kindergarten, and Learning Theory. In addition, the questionnaire was distributed online to several tutorial center administrators whom the researcher knew in the regions, Purwokerto, Semarang, Tasikmalaya, Lampung, Padang, Tangerang, Banten. The respondents of this study were UT students. There were 600 respondents who answered the questionnaire. A qualitative approach is used as an effort to better understand the respondents' responses. The data were analyzed using qualitative descriptive data analysis.

3. RESULTS AND DISCUSSION

Data from the questionnaire showed that most of the ECE student teachers who took the online tutorials stated that following the online tutorial help them to increase their IT skills, and help them to be more understood the content of the modules, and the presence of assignments and discussions made them study and think actively. Meanwhile, if there are things that cannot be asked to the tutor directly, they can find out fellow students from outside the class who are members of the tuton class. All responses from the respondents of this study revealed that:

participating in online tutorials turned out to be a way to help students learn without having to come to the tutorial site,

Participating in online tutorials could motivate and help UT students to be more active in their learning and students can learn from their peers and from their tutors, and By learning online, students learn to learn more in using computers and the internet.

4. CONCLUSION

The existence of tutors turns out to be a way to help students learn without having to come to the tutorial site and tutors can motivate and help UT students to be involved in their learning activities and students can learn from their friends and from their tutors, and participating in the online tutorials made the students to learn to use computers and the internet more actively. Other results show that dialogue in online learning tutorials can help UT students as transformative practice and problem posing. Providing dialogue can help close gaps and deepen understanding between students and instructors and between students themselves — and ultimately how distance learning at UT allows ECE student teachers to learn independently.

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DETERMINANTS OF LEARNER SATISFACTION ON ONLINE PRE-SUBMISSION PROGRESS PRESENTATION: WITH SPECIAL REFERENCE TO BACHELOR OF MANAGEMENT STUDIES (BMS) DEGREE PROGRAM

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ABSTRACT

The main purpose of the study was to investigate the determinants of the learner overall satisfaction towards online pre-submission progress presentation for the research project in BMS (Hons) Degree Program. With Covid-19 pandemic and subsequent lockdowns, learners are facing challenging situations to participate in the pre-submission progress presentation physically. In order to cope up with challenge during the pandemic situation, Faculty of Management Studies, the Open University of Sri Lanka decided to conduct a pre- submission progress presentation through the online mode. This was the first-ever experience of conducting an online pre-submission progress presentation for the subject of research project. The study was used quantitative, survey approach. An online structured questionnaire was used to conduct the survey. The research instrument was designed with six dimensions identified based on unified theory of acceptance and use of technology and its extension to the context of conventional university setup in Sri Lanka namely: performance expectancy, effort expectancy, social influence, hedonic motivation, internet experience, facilitating condition. The questionnaire was transformed to a Google form and the link was emailed to 289 participants of the pre- submission progress presentation for research project in BMS (Hons) Degree Program. However, 130 responses were received. First, the reliability and the validity of the instrument were ensured. Then, Pearson correlation and the multiple regression analysis were employed for data analysis. The results revealed that all the determinants have a significant positive association with learner overall satisfaction on online pre- submission progress presentation of research project. Further, performance expectancy is the significant determinant of the learner overall satisfaction while effort expectancy, internet experience and the facilitation condition are also positive significant determinants of learner overall satisfaction. However, social influence ant hedonic motivation are insignificant factors for the learner overall satisfaction of the pre-submission progress presentation of research project. Further , as suggested by the analysis, although it was the first 'online' presentation experience for most of

the respondents, their level of satisfaction in online pre- submission progress presentation was above par. The study further revealed that, learner perceives higher benefits to be drawn from online pre- submission progress presentations and they find this more convenient and easier. Hence, it is implied that if the intention is to enhance the learner satisfaction of studying the research project, the educators have the possibility of doing so, by improving the above stated aspects. By providing the students with proper guidance, knowledge, necessary resources, assistance, more interactive online sessions, better internet access and necessary infrastructure, students will get more benefits which will ultimately make them satisfied. There is further implication to education policy makers as learners still seek more cognitive aspects and the facility aspects in Sri Lanka. Thus, It could also be noted that better internet experience can result in higher learner satisfaction, signaling the Internet Service Providers and government authorities to provide high quality Island-wide internet coverage and necessary infrastructure, which is a crucial and timely requirement.

***Keywords**: learner satisfaction, online pre-submission presentation, research project.*

1. INTRODUCTION

The information communication technology (ICT) has revolutionized the entire world and caused a fast-changing society where the most of the people have changed their lifestyle from offline to online. Spotting from an educational perspective, the technology has drastically changed the nature of education and lives of individuals. The internet has been embraced by learners and education practitioners due to its immense ability to facilitate communication and transaction between consumer and business (de Valck,van Bruggen & Wierenga, 2009). Online learning is one of the popular tools with the advancement of ICT technology (Singh & Thurman, 2019; Bordoloi, Das & Das, 2021). It facilitates the process of teaching and learning more towards innovative, student-centered, more flexible (Dhawan, 2020). Further, online learning can be seen in synchronous and asynchronous environments. It can be accessible with different devices such as mobile phones, laptops and other communication devices with internet access. Hence, students are independent in learning and interact with teachers and other students (Singh & Thurman, 2019). With the rise of global COVID-19 pandemic, it has resulted in closure of higher educational institutes all across the world. With this crisis situation, online learning has become essential to meet the learners' academic needs (Dhawan, 2020). This has transformed the entire teaching pedagogy to a technology facilitating learner centered pedagogy (Bordoloi, Das & Das, 2021).

In the context of education in Sri Lanka, due to COVID-19 pandemic subsequent lockdowns are happening within the country. Similar to the global context in education, it is a challenging situation for the higher education institutions in Sri Lanka. To cope up with the challenge Faculty of Management Studies, the Open University of Sri Lanka decided to conduct a pre-submission progress presentation for final year students in Bachelor of Management Studies Honours Degree

Programme [BMS (Hons)] through the online mode. That was the first-ever experience of conducting a pre-submission progress presentation online. However, the skill of ICT is essential requirement for both teachers and learners in online learning (Bordoloi, Das & Das, 2021). Thus, investigating the determinants of leaner acceptance and use of information technology is utmost important in online learning set up. Though this has been commonly investigated with current pandemic situation (Samsudeen & Mohamed, 2019; Dhawan, 2020), in the context of online learning for research project is little investigated. With this regard, the main purpose of the study was to examine the determinants of learner satisfaction on online pre-submission presentation for Research Project in BMS (Hons) degree program.

a. Thus, main objectives of this study were
b. to identify the level of agreement on the dimensions of learner satisfaction related to the online pre-submission progress presentation for research project.
c. to assess the association between the dimensions of learner satisfaction and the overall satisfaction on the online pre-submission progress presentation for research project.
d. to investigate the most influential factors on learner overall satisfaction on the online pre-submission progress presentation for research project.

2. METHODOLOGY

a. Research Design, Participants and Procedure

This study employed a quantitative, survey study approach, and the data was collected by an online structured questionnaire for a period of three months from March to May 2021. The questionnaire was transformed to Google form and link was emailed to 289

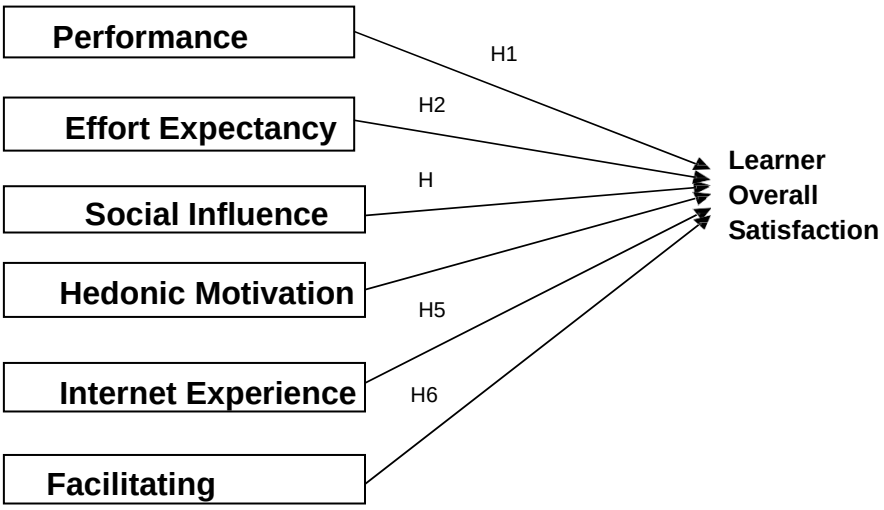
Undergraduates participated for online pre-submission progress presentation of the Research Project in the academic year 2019/20 of BMS (Hons) degree program. 130 completed questionnaires were returned. That is 45 percent of the targeted population. First, the reliability and the validity of the instrument were established. Then data were analyzed using IBM SPSS 23.0.

b. Conceptual Framework

Literature identifies several models for investigating individual use acceptance behavior and use of information technology: However, UTAUT (Venkatesh, Morris, Davis & Davis, 2003) and UTAUT2 (Venkatesh, Thong & Xu, 2012) were the most frequently used models to investigate learner behaviour intentions and the actual behavior in online learning systems (Masadeh, Tarhini, Mohammed & Maqableh, 2016; Samsudeen & Mohamed, 2019). Further, Samudeen& Mohamed (2019) propose a framework to the Conventional University system in Sri Lanka based on UTAUT and UTAUT2 with newly proposed two determinants: Work Life Quality and Internet Experience. Thus, this study has chosen the factors such as Performance Expectancy (PE), Effort Expectancy (EE), Hedonic Motivation (HD), Facilitating conditions (FC) and Experience (IE) have been considered after a rigorous literature review.

Figure 1 shows the proposed conceptual framework for the study.

Figure 1.
Conceptual framework



c. Hypotheses Development

Accordingly, following hypotheses were established.

Performance Expectancy (PE) is referred to the extent to which an individual believes that using the system will help him or her to achieve an expected performance (Venkatesh et al., 2003). Samudeen & Mohamed (2019) relate PE into the e- learning context and defined as extent to which a user of an e-learning system believes that using such a system would improve or increase his/ her performance in education. In simply PE refers to learners' belief that e-learning will help them achieve their educational goals (Abbad, 2021). Several studies have been identified PE as a strong predictor of intention to use a new system in e-learning (Venkatesh et al., 2003; Tarhini, Hone, Liu & Tarhini,2017; Ali, Raza, Qazi & Puah, 2018) and this study argues that students' perception on performance expectation has influence on the overall satisfaction on the online pre-submission progress presentation.

H1: There is a significant association between performance expectancy and learner overall satisfaction on online pre-submission progress presentation.

Effort Expectancy (EE) refers to the extent of the ease of use linked with when using a technology (Venkatesh et al., 2003; Samudeen& Mohamed, 2019; Abbad, 2021). Samudeen & Mohamed (2019) in their study relating to e –learn system, if the learner finds it is easy to use an e learning, there is more tendency of accepting such a system by a learner. Further, in the conventional university

set up, they have found that EE was the most important of the determinant of behavioural intention Online learning is still in its growth stage in the study context, thus develops the hypothesis as follows.

H2: There is a significant association between effort expectancy and learner overall satisfaction on online pre-submission progress presentation.

Social influence (SI) refers to the extent to which an individual perceives that how much important others believe he or she should use the new system (Venkatesh et al., 2003). In simply extent to which, an individual perceives on the social acceptance of the system. It can be assumed as if a system is getting high social influences individual accept the system. In this study it is the online pre-submission presentation.

H3: There is a significant association between social influence and learner overall satisfaction on online pre-submission progress presentation.

Hedonic Motivations (HM) is a newly added variable to the UTAUT model in developing UTAUT2 and it refers to the fun or pleasure generate from using a technology (Venkatesh et al., 2012). It is identified that perceived enjoyment and perceived entertainment can be used to investigate the intrinsic utilities of a system.

H4: There is a significant association between hedonic motivation and learner overall satisfaction on online pre-submission progress presentation.

Research Instrument

To measure the concepts identified, the questionnaire comprised with two sections. The first section consists with three questions; respondents age, gender, presentation experience and online experience. The second section comprised with twenty eight items on determinants of pre submission presentation: four statements on performance expectancy, five statements on effort expectancy, four statements on social influence, five statements on hedonic motivation, five statements on internet experience, five statements on facilitating condition meanwhile three statements to measure the learner satisfaction, The respondents were asked to rate their level of agreement on a five-point Likert scale.

3. FINDINGS AND DISCUSSION

a. Sample profile

The sample consisted of 78.6 percent of female learners and 21.4 percent of male learners, while the majority of them are between 25-30 years of age (88.4%). The majority of the learners claim that this is their first presentation experience (76.8%), whereas most of them have stated that this is their first 'online' presentation experience (91.3%).

b. Reliability and Validity

Table 1 presents the results of the instrument validity and reliability; internal consistency using Conbrach Alpha, Composite reliability (CR) average variance extracted (AVE) and Square root of AVE and correlation coefficients .

Table 1.
Reliability and Validity

Variable	***Internal Consistency***	***Convergent Validity***		***Discriminant Validity***						
	Conbrach Alpha	***CR***	***AVE***	***PE***	***EE***	***SI***	***HM***	***IE***	***FC***	***OS***
Performance Expectancy	*0.928*	*0.867*	*0.621*	***0.787***						
Effort Expectancy	*0.921*	*0.853*	*0.531*	*0.735*	***0.728***					
Social Influence	*0.848*	*0.791*	*0.621*	*0.647*	*0.667*	***0.787***				
Hedonic Motivation	*0.812*	*0.797*	*0.568*	*.626*	*0.618*	*0.629*	***0.753***			
Internet Experience	*0.817*	*0.719*	*0.688*	*.486*	*0.410*	*0.316*	*.370*	***0.829***		
Facilitating Condition	*0.799*	*0.864*	*0.539*	*.550*	*0.557*	*0.545*	*.522*	*.522*	***0.732***	
Learner Overall Satisfaction	*0.924*	*0.761*	*0.515*	*.745*	*0.718*	*.570*	*.559*	*.584*	*.648*	*1*

As shown in Table 1 all the Cronbach Alpha (α) values of the dimensions of learner satisfaction are greater than the threshold point of 0.7. Thus, internal consistency of the measurement properties was ensured. Further, construct validity was measured through convergent validity (CR > AVE) and discriminant validity. Square root of AVE was greater than the correlation coefficient values and discriminant validity was ensured.

c. Learner Level of Agreement on Satisfaction Dimensions and Association with Overall Satisfaction

Table 2.

Shows The Mean Values And Standard Deviation Values Derived For Each Variable

Variable	***Mean***	***Standard Deviation***	***r***	***Sig.***	***Supported/ Rejected***
Performance expectancy	*3.941*	*0.808*	*0.735*	*0.000*	*Supported*
Effort expectancy	*3.853*	*0.766*	*0.728*	*0.000*	*Supported*
Social influence	*3.885*	*0.820*	*0.570*	*0.000*	*Supported*
Hedonic motivation	*3.435*	*0.804*	*0.559*	*0.000*	*Supported*
Internet experience	*3.763*	*0.839*	*0.584*	*0.000*	*Supported*
Facilitating condition	*3.681*	*0.687*	*0.648*	*0.000*	*Supported*
Overall satisfaction	*3.944*	*0.845*			

Accordingly, the highest mean value (3.944) was recorded for 'Learner overall satisfaction', while all the other variables have recorded mean values that are greater than 3 on a five-point Likert scale. Thus, it can be stated that the learners have shown a positive level of agreement for all variables. These results reaffirmed the findings of Khairuddin, Arif & Khairuddin (2020) where learners are already in the process of adapting themselves for the forthcoming online distance learning era.

Further, Table 2 depicts the results of the Pearson correlation analysis: the degree of association between learner satisfaction dimensions and their overall satisfaction with the pre-submission progress presentation for the Research Project. Accordingly, all the hypotheses were supported ($p<0.05$) and this indicates that all the dimensions of learner experience dimensions have a significant positive association with the learner satisfaction. However, the highest association was with performance expectancy ($r=0.735$) followed by effort expectancy ($r=0.728$) and facilitation conditions ($r=0.648$) whereas a moderate association was with social influence, internet experience and hedonic motivation.

d. The Most Influential Factors

Variable	***Beta coefficient***	***t***	***sig***	***R square***	***Adjusted R square***	***F***	***sig***
Performance expectancy	*.294*	*-.527*	*0.006*	*0.671*	*0.655*	*42.156*	*.000*
Effort expectancy	*.267*	*2.822*	*0.011*				
Social influence	*.026*	*2.596*	*0.739*				
Hedonic motivation	*.031*	*.334*	*0.666*				
Internet experience	*.190*	*.432*	*0.012*				
Facilitating condition	*.176*	*2.544*	*0.036*				

Table 03 presents the Beta coefficient of satisfaction dimensions: performance expectancy (0.294, 0.006 <0.05), effort expectancy (0.267 , 0.06 < 0.05),social influence (0.026, 0.739 > 0.05), hedonic motivation (0.31, 0.666>0.005), Internet experience

(0.190, 0.012 <0.05), facilitating condition (0.176, 0.036<0.05). Further, results reveals that indicates that only performance expectancy (0.294, 0.006 <0.05) is the significant determinant of the learner overall satisfaction of the pre-submission progress presentation of research project followed by effort expectancy (0 . 2 6 7 , 0.06 < 0.05). Internet experience and the facilitation condition are also positive significant determinants of learner overall satisfaction while social influence ant hedonic motivation are insignificant factors for learner overall satisfaction of the pre-submission progress presentation of research project. Further, R square was 0.671 at F

=42.156 (0.000< 0.05). This shows that determinants of learner satisfaction are explaining 67.1 percent of variation of learner overall satisfaction.

4. CONCLUSION

The main purpose of this study was to investigate the determinants of learner satisfaction on online pre-submission presentation for BMS (Hons) degree program. Heavily due to the COVID-19 pandemic, the status quo has been challenged, and shattered up to a certain extent, despite the scale and the type of industry. The massive impact on the field of education hence demanded a shift to online platforms and other alternatives which were a prominent and a timely requirement (Mulenga & Marbán, 2020). Therefore, an online pre- submission progress presentation for research projects was conducted and an attempt was taken to evaluate the learners' overall satisfaction towards this novel experience.

The results of the study revealed that learners are satisfied with the online pre-submission progress presentation which signals the viability of the adoption of online learning platforms on online pre-submission presentation for Research Project and its continuation in the post- pandemic era which would ultimately contribute to a paradigm shift in the Sri Lankan education industry. Further, though all the dimension of learner satisfaction performance expectancy, effort expectancy, social influence, hedonic motivation, internet experience and facilitating conditions are significantly and positively associated with learner overall satisfaction, major factors contributing for learner overall satisfaction are performance expectancy, effort expectancy, internet experience and the facility condition. Social influence and hedonic benefits were insignificant in this context whereas Samudeen & Mohamed (2019) identify all the factors considered are significant determinants in the context of e learning systems in conventional universities, Sri Lanka. Hence, if the intention is to enhance the learner satisfaction, the educators have the possibility of doing so, by improving the above stated aspects but need to more concern on performance expectancy, effort expectancy, internet experience and the facility condition. Further, by providing the learners with proper guidance, knowledge, necessary resources, and assistance, facilitating conditions can be improved, through which the learners can be satisfied. Similarly, if the online programs are well planned to be effective and efficient, learners will get more benefits which will ultimately make them satisfied. Further, by making academic virtual meetings with learners more interactive and amicable, they will be able to make this experience more enjoyable, leading to their satisfaction. It could also be noted that better internet experience can result in higher learner satisfaction, signaling the Internet Service Providers and government authorities to provide high quality Island-wide internet coverage and necessary infrastructure, which is a crucial and timely requirement.

However, this study has several limitations such as the response rate is low compared with the targeted population. The human emotions, behaviors were not taken in to account due to use of structured questionnaire. These limitations will be shed new research avenue as comparing learner overall satisfaction in next batch. Further, by identifying more determinants by conducting qualitative studies about the same context.

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DEFINING THE INFORMATION REQUIREMENTS TO BUSINESS INTELLIGENCE DASHBOARD FOR ACADEMIC PROGRAMME MANAGEMENT: A CASE STUDY FROM THE OPEN UNIVERSITY OF SRI LANKA

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ABSTRACT

Despite the growth of data, academic departments in universities are concerned about lack of insight into academic program delivery progress. Academia requires insights to execute proactive measures to ensure the successful delivery of Programme and courses. This dearth of insights is mostly due to a lack of reporting mechanisms that provide a quick glimpse of progress and real-time surveillance. In order to, address this problem, the authors drew on the sense making theory, confirming the previous theorizations by proposing the business intelligence dashboard as a tool which assist in insight extraction throughout the sense making process and in decision making about academic program delivery management. A business intelligence dashboard is one such reporting tool that provides snapshots of real time progress. Consequently, this contributes to confirm the current understanding on tools of sense making and more importantly provides academics with a prototype dashboard they can utilize to get insights for their decision on academic programme delivery management. Despite its significance for academic program delivery management, business intelligence dashboards are overlooked in Asian, primarily in Sri Lankan higher education context. Therefore, the question of what information should a business intelligence dashboard for academic program delivery management contain, to provide related insights to academia, remains unanswered. Consequently, in order to, address this question, this study was conducted focusing on the academic programme management of MBA in HRM to identify the information requirements to develop a prototype of a business intelligence dashboard to provide insights. In this endeavor, this study adopts a positivist philosophical lens and design science research approach and follows action-research project strategy. Correspondingly, an iterative research method is proposed based on the existing Cross-Industry Standard Process for Data Mining. The limited focus of this study opens for new avenue in studying the business intelligence tools' requirements for an individual or another academic programme. Further, future study could focus on implementation of this dashboards. In addition, this case study from the open university of Sri Lanka, will provide insight into the identification of requirements and the

implementation of business intelligence dashboards for institutions offering similar academic programmes.

Keywords: *Business Intelligence Dashboard, Academic Programme Management, Programme Delivery, The Open University of Sri Lanka.*

1. INTRODUCTION

As the famous philanthropist Eric Lefkofsky quotes, we live in the era of big data and even bigger analytics; we live in the era of insight. There is a significant relationship between data driven insights and; existence and survival of any field in this era of globalization, which is the age of interaction and integration among people. The need of data driven insights are required in the field of higher education as the academic programmes are managed with the input of data and an efficient analysis of the data to perform decision making in terms of implementation of academic delivery (Wyne, Reeves, & Gurbach, 2015). There is a set of bodies in universities to monitor, evaluate and measure its academic delivery and they contribute in decision making with the predominant assistance of technology to analyse data. This article intends to present this research focusing on the need of data driven insights for academic programme management. Academic programme management in higher education requires appropriate and prompt academic reports to make decisions to implement and improve the quality of academic delivery (Destiandi & Hermawan, 2018). However, significantly visible problem is that there is no or less assistance of technology involved in the growing need of data driven insights of academic programme management. Hence, this research highlights that a real time reports with bird eye view are crucial to provide insights about academic programme management (Wyne et al.,2015). To propose a viable solution for this existing lacuna, researchers have sought out the sense making theory which explains that sense making requires ongoing retrospection of past and extraction of meaningful cue from the environment (Strenger, as cited in Namavar & Cybulski, 2014, p.1; Weick et al., as cited in Namavar & Cybulski, 2014, p.1). Accordingly, sense making theory which is a way of understanding an organization to make decision, recommends Business Intelligence (BI) Dashboard as a tool which will assist in extraction of meaningful cues from the environment and provide data driven insights for decision making (Namavar & Cybulski, 2014, p.1).

BI, being a management term, generally used to describe the applications and the technologies that are involved in gathering, transforming, and analysing data in business in order to provide better decision-making process and dashboard is a BI reporting tool (Destiandi & Hermawan, 2018). Thus, BI dashboard as a tool popularly used to integrate and analyse data to generate insights for present quick, comprehensible overviews of the institution's status and direction (Schneider, 2007). In this context, the proposal for application of BI dash boards for academic management programme is not novel as it has been already discussed and implemented at many universities from different global jurisdictions. Therefore, there is an established academic literature to justify the application of BI dashboards in academic programme management and this article is not another contribution on this regard. On contrast, this article is a case study of defining the information requirements for BI dashboard of academic programme management. It is to be

noted that a successful implementation of BI dashboard depends on the proper identification of requirements as it enables the relevant data visualization.

This case study was carried out on the academic progremme of MBA in HRM at the Open University of Sri Lanka (OUSL) for the academic year 2020/2021. Being a pioneer in imparting the academic delivery through open and distance learning, the Open University of Sri Lanka differs from conventional universities not only in terms of its mode of academic delivery, but also in terms of a university teacher's role and responsibilities. The course development and academic coordination are significant duties for OUSL teachers. Currently, there is no technological tool directly applied to carry out the academic management programme at OUSL and it is carried out manually by the OUSL teachers. The researchers believe that the case study is highly relevant and significant as the requirements identified for a BI dashboard to academic management can be employed by the OUSL and similar institutions to design a dashboard to enable real time insights in this regard.

Against this introduction, the following objective was pursued; to identify the information requirement of a BI dashboard for academic programme delivery management, of an academic department. This study sought to achieve the following research aims.

-to identify the information requirement of a BI dashboard for academic programme delivery management

-to prepare a BI dashboard prototype for academic programme delivery management, for an academic department

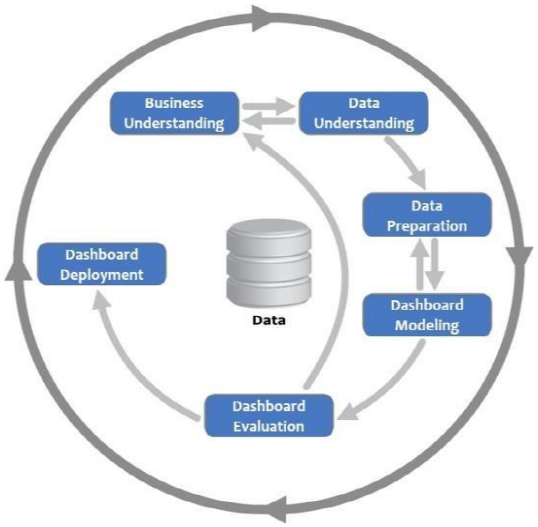
There is substantial academic literature on the application of BI dashboard in higher education, which covers the identification of requirements for BI dashboard. This study will add to the literature on what requirements are identified in a higher education institute functioned through ODL and will be a new contribution to the documentation from Sri Lanka. Part I introduces the title of this research while Part II describes the research method. Part III discusses the identification and applicability of requirements for BI dashboards to academic programme management. In the end, this paper suggests requirements for business intelligence dashboards and presents a prototype. In addition, preparation of comprehensive dashboard and deployment of BI dashboards for academic programme management areas are identified for future research.

2. METHODOLOGY

This study will adopt a positivist philosophical lens (Wayne, 2010, p.7) and the design science research approach (Iriberri & Stengel, 2021). To this end, the present study will follow action- research project strategy (O'Meara et al., 2020, p.35), in which the focus of project will be confined to the postgraduate programme in the academic department of human resource management, attached to faculty of management studies in The Open University of Sri Lanka. Correspondingly, an iterative research method is proposed based on the existing Cross-Industry Standard Process for Data Mining (CRISP-DM) (Wah, Suiying & Shuangjie, 2019, p.321). Fig 1 shows the CRISP-DM Model.

Figure 1.

Cross-Industry Standard Process for Data Mining Model.



CRISP-DM was adopted for this study. Accordingly, the research process began with the user requirement analysis relating to postgraduate program and its management. At this stage, data was gathered using primary and secondary sources. Furthermore, primary data was collected through interview of four staff who were involved in management of the selected programme. Following that, the requirements for business intelligence dashboards was determined based on a thematic analysis of interview data. In addition, secondary data was collected from Bylaws and student guidebook. Subsequently, the required data to present were understood and prepared. Then, data requirements were specified only for sample themes (Grand academic plan progress task wise and Day school progress course wise) chosen for prototype dashboard. In this case, number of day schools completed was decided as indicator to be presented under day school progress. In addition, plan and actual comparison task wise (with pending indication) was decided as indicator to be presented under progress against grand academic plan. Further, data sources were identified, extracted, verified, and tabulated. Moreover, following the data preparation, the prototype dashboard modelling was carried out, using Microsoft Excel. In order to visualize the grand academic plan progress and day school progress respectively Gantt chart with plan actual comparison and Pie chart with progress indication were chosen as visualization techniques. The literature review was performed throughout the study.

3. FINDINGS AND DISCUSSION

This part includes the discussion on identification of requirements for BI dashboards and prototype dashboard for academic programme management.

a. Identification of Requirements for BI Dashboards to Academic Programme Management

The requirements for BI dashboard to academic management programme was gathered through structured interviews with the selected academics who are immediate stakeholders in the decision-making process. The identification was processed in the light of the opinions described for pre-determined questions through thematic analysis. Table 1 shows the predetermined questions of the interview and the general requirements and sub requirements generated from the responses of participants.

Table 1.

Predetermined interview questions, general requirements, and sub requirements.

Pre-determined Questions	***Generated Requirements***	***Sub Requirements***
What decision you make relating to MBA in HRM programme? What insight you require in making decision regarding MBA in HRM academic Programme management?	*Academic Delivery*	• *Grand academic schedule tracker* • *List of in progress activities (Daily, weekly, and monthly)* • *Day school progress course wise* • *Assessment progress course wise* • *Profile of academic panel*
	Budget	• *Budget and variance analysis* • *Payment tracker*
	Learner support	• *Registration status batchwise and course wise* • *Course completion list* • *Moodle access percentage course wise* • *Student complaint tracker*
	Support Service	• *Moodle account creation status*

Pre-determined Questions	***Generated Requirements***	***Sub Requirements***
	Policy Documents	• *Bylaw link and summary* • *MOU link and summary*

b. Prototype Dashboard for Academic Programme Management

The study attempted to prepare a prototype dashboard showing the progress status against grand academic plan and days school progress, which were elements of academic delivery.

Figure 2.

Dashboard showing progress status against grand academic plan and days school progress

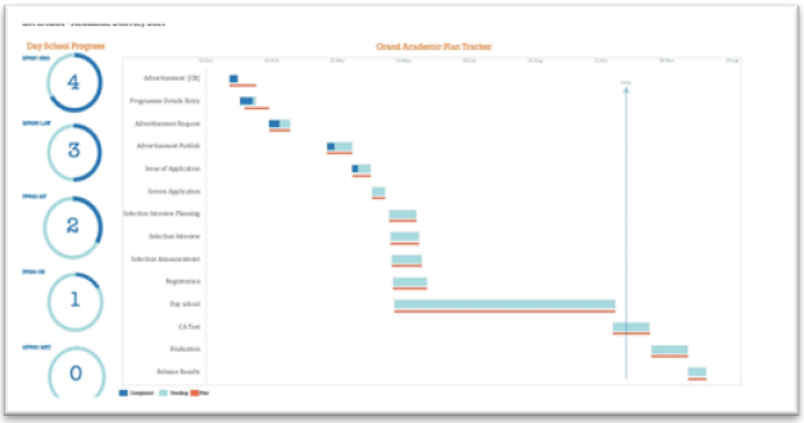


Fig 2 shows the dashboard prototype showing progress status against grand academic plan and days school progress. These main and sub themes were identified (which shows requirements) in the data collection process. Subsequently, the relevant indicators and data requirement were determined. Then the relevant data was collected and prepared. Following that the visualization of indicators were determined. According to the Fig 2, number of day schools completed course wise is shown under day school progress, using a Pie chart with progress indication. Further, plan versus actual comparison task wise (with pending indication) is shown in progress against grand academic plan.

4. CONCLUSION

Above mentioned search has been carried out to identify the information requirement of a BI dashboard for academic programme delivery management and to prepare a BI dashboard prototype for academic programme delivery management, for an academic department. According to the thematic analysis employed on the data gathered from the selected academics of MBA in HRM programme, this study identify progress on adamic delivery, progress against budget, progress on learner support, progress on support service and policy documents as the key requirements for business intelligence dashboards of academic programme management at OUSL. In addition, this paper also includes a BI dashboard prototype for two identified requirements. Given that the purpose of this study is to describe the requirements for business intelligence dashboards, the modelling and deployment of such business intelligence dashboards are areas for future research.

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STUDENT INNOVATION COMPETENCY MODEL EXAMINATION: STUDENTS OF UNIVERSITAS TERBUKA, IPB UNIVERSITY, AND UNIVERSITAS PAKUAN BOGOR 2020

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ABSTRACT

The Society 5.0 era has become an opportunity in the education industry to contribute optimally, especially for universities in Indonesia. Higher education institutions must provide human resources (HR) to compete in science and scientific practice. The research aims to identify the innovation competency development model on academic participants in universities and analyze factors that affect the innovation competencies of students at the college level. This study used a quantitative explanatory method to explain variables that significantly influence shaping student innovation competencies. Respondents were taken from three universities, conducted from May to October 2020. There were 162 students selected as research samples. The study findings suggest that not all research variables have significant influences on student innovation competencies. The research suggests two variables that have significant effects on shaping student innovation competencies. Both variables are critical thinking and social networking. In detail, critical thinking is reflected best by estimating the risks and variables of social networks reflected strongest by building synergy with external parties.

Keywords: *Critical thinking, social networking, innovation competence, PLS-SEM.*

1. INTRODUCTION

Indonesia will soon be entering the Society 5.0 era. This condition becomes an opportunity and a challenge for the education world in Indonesia, including universities in Indonesia. Higher education institutions are required to provide human resources that can compete in science and scientific practice. In order to be able to produce student resources that can take part in the 5.0 era, it takes hard work and integration of all stakeholders within the higher education, notably in improving student innovation in facing the job market demands. Innovation, by definition, is something new or a change in doing or seeing something (Rubio, 2012). Innovation can be ideas, behaviors, knowledge, skills, products, services, and processes.

Studies on innovation are found in management and agriculture, but not much in higher education environments. However, according to Jucevičius (2007), the culture of innovation is undoubtedly part of the organizational culture and management concept.

There are three cultural aspects of this concept: culture has many layers (i.e., values, norms, beliefs, and basic assumptions); this layer needs to be distributed among institutional members (students, faculty members/academics, support staff, administrators, and board members); Innovation has a vital position especially in eliminating problems related to educated unemployment. Currently, the problems faced by students and universities are the high rate of educated unemployment. The high educated unemployment number allows opportunities for universities to innovate in managing administrative and academic activities.

Student innovation competencies can be obtained in various ways, and one way is by building students' entrepreneurial spirit. It is necessary to develop a curriculum in enriching aspects of entrepreneurship to achieve this. This fact may be a solution in unraveling the educated unemployment number currently in Indonesia. Students are expected to acquire creative and innovative thinking skills from learning processes that stimulate their analytical and psychomotor skills. They can have more experience through practices conducted in learning that are expected to be implemented in the real world or after graduation (Harnani et al., 2020).

Through innovation and skilled human resources, Indonesia will have the competitiveness in the industry, both domestic and overseas, to support the National Economy development.

This study will focus on picturing the innovation competency model in universities viewed from a vital perspective on skill position and innovation. Innovation competencies referred to in this study are innovation competencies for students and students. Innovation competency is needed in shaping the quality of education. Therefore, the importance of innovation competencies needs to be internalized by all academic communities in universities. Five main variables assumed to affect innovation competencies based on the terms of reference of the Turku University of Applied Science, Finland is (1) Creativity, (2) Critical Thinking, (3) Initiatives, (4) Teamwork,

(5) Social Networking. This variable is theoretically a factor that can drive the innovation competence of a college. Based on the description above, this study aims to: (1) identify the model of innovation competency development of academic participants in universities and (2) analyze the variation of factors that affect the innovation competencies of students in universities.

2. LITERATURE REVIEW

- Innovation

  One's innovativeness is defined as a behavior that demonstrates the level of innovation that a person has done. In this research, innovation competency is defined as the level of capacity of students in innovating in the context of learning

activities and activities of student organizations. According to Schermerhorn et al. (2010), innovation is also defined as generating new ideas and applying those ideas in real action. In addition, innovation is also defined as creative thinking and can be applied in daily activities to make better administrative services.

- Innovative Learning

  Students involved in innovative classroom learning activities must have unique skills and competencies (Kivunja, 2014; Quintana et al., 2016; Vila et al., 2012). Kivunja (2014) states that the key to teaching creativity and innovation lies in creating a learning environment where students can solve problems in the "real world" and be open to change. Meanwhile, Vila et al. (2012) described that solution-focused learning could improve the innovation competence for college students. Furthermore, Hu et al. (2016) explained that an innovative curriculum could improve students' innovative competencies. Developing an innovative curriculum will require prerequisites such as attitudes and behaviors, methods, perspectives, enthusiasm, and a supportive learning environment. An alternative paradigm of pedagogic learning is required to develop competence in innovating that makes learning closer to daily practice.

- Innovation Competency

  Several previous studies have discussed innovation (e.g., Hu et al., 2016; lesson material skills by Suharyati et al., 2016). For example, in previous research, innovation competency is only narrowly defined as focusing only on creativity skills, measuring teacher competence, or as a perspective of students' self-perception and not based on action. or behavior. Innovation competencies should also be targeted to build a technical learning environment, such as examining teaching or general perception of training or education. In general, attributes that can shape innovation competencies are related to transversal competencies. However, according to Suharyati et al. (2016), there is currently no valid and completed framework for studying student behaviors or actions required at different stages of learning. The innovation process also developed in an educational context. Furthermore, Marin-Garcia et al. (2013) pointed out a research gap between academic literature around its innovation competence and measuring and developing the concept.

  Competency is a holistic concept that describes one's ability to manage in a particular context (Mulder, 2012). According to Marin-Garcia et al. (2013), competency, skills, and abilities can be considered three categories of contextual knowledge complexity. First, competencies consist of a set of skills, and these are, in turn, shaped by different skills, all of which are prerequisites for increasingly complex professional performance. Second, competence can be described as a complex knowledge of acting through effective mobilization and combining different internal and external resources in one situation (Marin-Garcia et al., 2013). Edwards-Schachter et al.

  2015 in Suharyati (Learning Perspective et al., 2016) added one competency-based approach. They emphasize that all skills can be learned and taught as part of an integrated personal development process in an educational environment.

3. ORIENTATION AND RESEARCH APPROACH

- Research Design

  This study of student innovation competency uses an explanatory quantitative method to explain which variables have the most substantial influence in shaping student innovation competencies. According to Singarimbun and Efendi (2008), exploratory research is research aimed at testing hypotheses to look at causality and between variables that have been built. This study will examine students' perceptions of three universities representing the main and independent clusters: innovation competencies, critical thinking, creativity, initiative, teamwork, and networking skills, which will be portrayed on student innovation competency and students from research sites.

- Research Location and Time

  This research was located in three universities: Open University (UT), IPB-University, and Pakuan University. The research site selection was conducted purposively based on consideration of universities with distance learning systems – remote and face-to-face, and universities that come from the primary and independent clusters. This research has been conducted since April-October 2020.

- Observed Modifiers

  This study aims to answer two questions; identifying the development of the student innovation competency model and analyzing factors that can improve innovation competencies. Based on both research objectives, several variables were developed as follows: (1) Student innovation competency, (2) student teamwork ability level, (3) Student networking ability, (4) Student Initiative, (5) Student creativity level, (6) Student critical thinking ability.

- Population and Research Samples

  The population in the study was students from three universities, i.e., Open University, IPB- University, and Pakuan University. Estimating parameters with the Maximum Likelihood method requires critical assumptions such as a sample size of at least 10-15 times multiplied by many indicators, or at least 100 observation units. The data spread following the average spread (Ulum et al., 2014). Sampling techniques used in this study were non-proportionate simple random sampling. There were 160 students as respondents in this study. The study used a survey approach by sharing questionnaires to respondents at three sample universities.

- Research Design

  The research was designed using quantitative methods with an explanatory approach to explain which dominant variables shape innovation competencies. According to Singarimbun and Efendi (2008), explanatory studies are hypothesis testing that aims to explain the causal relationship between research variables and test hypotheses formulated before. The dependent variables in this study are the lecturer's innovation competency (Y). In addition, there are three independent variables and two intervening variables in this study, which are theoretically assumed to affect the lecturer's innovation competency.

This study will examine lecturers' perceptions of three universities representing both main and independent clusters on innovation competency, critical thinking, creativity, initiative, teamwork, and networking skills. This way, the level of innovation competency will be drawn from lecturers and students from the research site.

- Research Location and Time

  The first- and second-year research will be conducted at three universities: Open University (UT) (which represents State Universities with distance education system), IPB University (representing State Universities with non-remote education system), and Pakuan University (representing Private Universities). These three universities are purposively selected to represent public and private universities, with conventional education systems and distance education systems, and significant and independent cluster universities. The first-year research was conducted from January 2020 to December 2020.

Observed Modifiers

- Observed Variables

  This research intended to answer two fundamental issues related to innovation competency; what model of innovation competency development of lecturers and students is, and a comparison of lecturers and students' innovation competencies from Open University, IPB-University, and Pakuan University. Should these two research questions derived into several variables, they would be as follows: (1) Lecturers' innovation competency, (2) Lecturers team's ability level to cooperate, (3) Lecturers' ability to network, (4) Lecturers' initiative, (5) Lecturers' creativity level, (6) Lecturers' critical thinking ability.
- Population Definition and Research Samples

  The population in the study were lecturers and students from Open University, IPB-University, and Pakuan University. Methodology-wise, SEM-PLS has several roles as a system of simultaneous equations, linear causal analysis, path analysis, covariance structures analysis, and structural equations models. Estimating parameters in SEM or commonly known as SEM-based Covariance (CBSEM), usually use the Maximum Likelihood approach method. In evaluating the model, this Maximum Likelihood method requires a large sample, and the data should be normal multivariate. Estimating parameters with the Maximum Likelihood method requires some critical assumptions, such as a sample size of at least 10 – 15 times the number of indicators or more than 100 observation units. The data spread following the average spread (Ulum et al., 2014).

  Sampling techniques used in this study were non-proportionate simple random sampling. There was a total of 150 students. The study used (1) a survey approach by sharing questionnaires against which to be shared across three sample universities.

4. FINDINGS AND DISCUSSIONS

Characteristics of Respondents

Table 1.
Distribution of Respondent Data Based on Faculty Origin

Faculty Origin	Frequency (People)	Percentage (%)
Nature, Math and Science, and Engineering	35	21.61
Economics Management and Business	18	11.11
Social, Cultural, and Human Ecology	60	37.03
Teaching and Education Science	16	9.88
Vocational Schools/Diploma	33	20.37
Total	**162**	**100**

In Table 1, respondents of this study were from several faculties, such as nature, economic, social, teaching, and vocational schools. Most research respondents were from faculties related to social sciences (Social, Cultural, Law, and Human Ecology) at 37.03 percent, followed by students from the faculty of nature, Math and science, and engineering, with 21.6%. The least respondents were from vocational/diploma schools with 9.88 percent.

Table 2.
Distribution of Respondent Data by Semester

Learning Semester	Frequency (People)	Percentage (%)
1-2	30	18.52
3-4	40	24.69
5-6	43	26.54
7-8	44	27.16
≥ 9	5	3.09
Total	**162**	**100.00**

A learning semester in this research is defined as an active semester of students during this research. Table 2 shows that the respondents of this study were from nearly all semesters, ranging from the first semester to the 9th semester and above. Students from semesters 7-8 have the highest percentage with 27.16%, followed by

semesters 5-6 and 3-4 with 26.54% and 24.69%. Meanwhile, a minor percentage is from students above semester 9, 3.09%.

Table 3.
Distribution of Data Based on Student Activity in Internal Campus Organizations

Internal Campus Organisation	***Frequency (Orang)***	***Percentage (%)***
Active as Members	*69*	*42.6*
Active as Caretakers	*24*	*14.8*
Inactive	*69*	*42.6*
Total	***162***	***100***

Student activity in the internal campus organization is defined as the student activities in intra- campus organizational activities at the department, faculty, and university levels. Table 3 shows that the percentage among active students as members has the same percentage as students who are not active in student activities, with a percentage score of 42.6%. Nevertheless, when compared directly between students who are active in the organization with students who are not active in the organization, it is seen that a total of 57.4 percent of students are active in student activities both as members and caretakers.

Table 4.
Distribution of Data Based on Student Activity in Internal Campus Organizations

Off Campus Organisation	***Frequency (People)***	**Percentage (%)**
Member	*51*	31.5
Caretakers	*15*	9.3
Inactive	*96*	59.3
Total	***162***	**100**

Off-campus student organization activities are defined as organizational activities that students participate in off-campus. Although from the table, 59.3% of students are not active in off- campus activities, only 40.7% of students are active in student activities either as caretakers or members.

Student Innovation Competency Model

- Validity and Reliability of Indicators

  The variables in this model consist of six latent variables consisting of five independent variables and one dependent variable. The dependent variables in this model consist of five dimensions where each dimension has five indicators. Model completion can use two approaches, i.e., the repeated indicators approach and the disjoint two-stage approach. When using the repeated indicators approach, calculation of validity, reliability, and discriminant validity is manually calculated, while using two-stage disjoint, there are several processing steps.

  The first phase of testing uses the repeated indicators approach to determine the loading factor, validity, and reliability of independent variables and the dimensions of dependent variables.

  Next, the latent variable value (Y11-Y15) from the repeated indicators approach results is used to test dependent variables' validity, reliability, and discriminant validity in the second stage.

  Next is the two-stage disjoint analysis. The PLS Algorithm testing results show that the indicator's validity is valid as the loading factors value is more significant than 0.5 (Figure1).

  The analysis was continued with the repeated indicators approach, whose model results can be seen in Figure 2. The results of the variable validity test are described with an Average Variance Extracted (AVE) value, which is already larger than 0.5. The reliability per variable described from Cronbach's Alpha, rho A, and composite reliability values have been fulfilled with values greater than 0.6 (Table 5). The discriminant validity value is also quite good because it is less than 0.85 (Table 6).

Table 5.
Reliability and Validity

Variable	*Cronbach's Alpha*	*Rho A*	*Composite Reliability*	*Average Variance Extracted (AVE)*
X1	*0,825*	*0,825*	*0,877*	*0,589*
X2	*0,875*	*0,877*	*0,909*	*0,667*
X3	*0,851*	*0,854*	*0,894*	*0,629*
X4	*0,881*	*0,909*	*0,911*	*0,673*
X5	*0,893*	*0,895*	*0,921*	*0,700*
*Y1**	*0,923*	*0,925*	*0,942*	*0,764*

Note: Italics used for higher-order construct values

Figure 1.
Early Outer Model

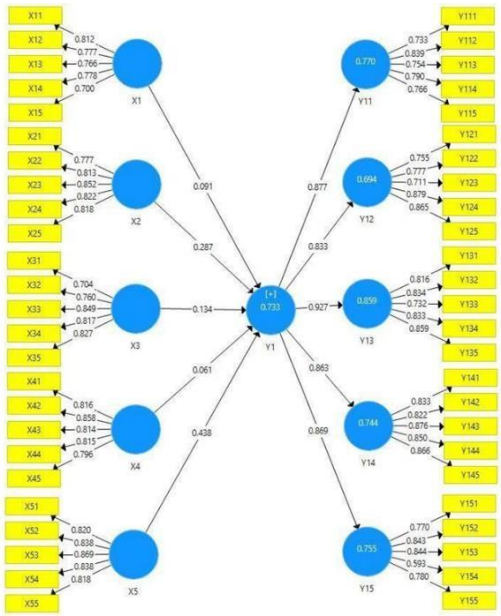
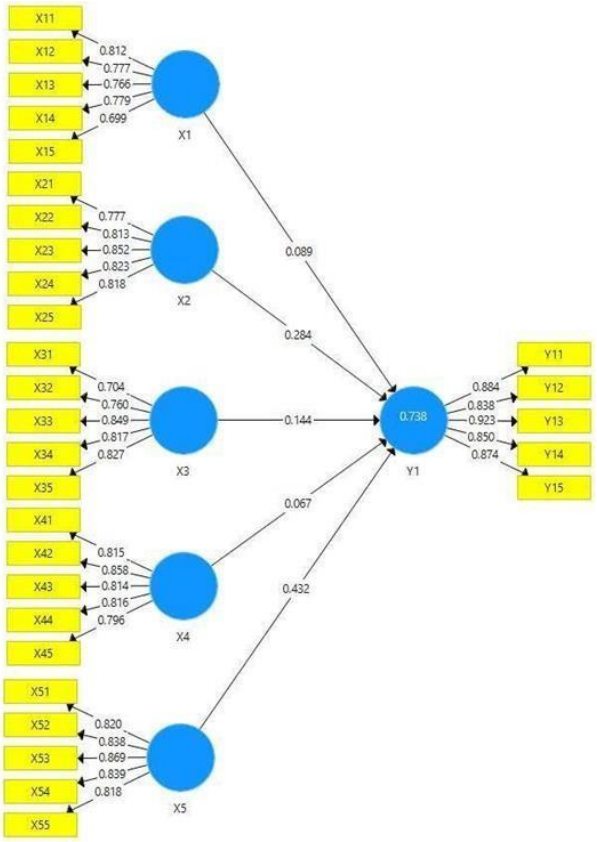


Table 6.
Final Discriminant Validity

	X1	X2	X3	X4	X5	Y1	Y11	Y12	Y13	Y14	Y15
X1											
X2	*0,723*										
X3	*0,723*	*0,728*									
X4	*0,581*	*0,402*	*0,540*								
X5	*0,692*	*0,532*	*0,625*	*0,495*							
*Y1**	*0,736*	*0,710*	*0,721*	*0,525*	*0,768*						
Y11	*0,702*	*0,647*	*0,704*	*0,530*	*0,667*	-					
Y12	*0,619*	*0,588*	*0,611*	*0,551*	*0,617*	-	*0,772*				
Y13	*0,640*	*0,640*	*0,668*	*0,409*	*0,704*	-	*0,766*	*0,712*			
Y14	*0,596*	*0,578*	*0,505*	*0,340*	*0,657*	-	*0,641*	*0,561*	*0,787*		
Y15	*0,656*	*0,644*	*0,653*	*0,461*	*0,708*	-	*0,674*	*0,627*	*0,763*	*0,743*	

Note: Italics used for higher-order construct values

Figure 2.
Disjoint two-stage Outer Model



Based on Figure 1 and Figure 2 above, it appears that:

a. The indicator that best reflects Creativity (X1) is the Diversity of Ideas (X11) indicator, with the most considerable loading factor value (0.812).
b. The best indicator for reflecting Critical Thinking (X2) is the Risk Estimating indicator (X23), with the most considerable loading factor value (0.852).
c. The indicator that is best at reflecting Initiation (X3) is the Convincing Other Party (X33) indicator with the most considerable loading factor value (0.849).
d. The indicator that best reflects Teamwork (X4) is the Accepting Difference (X42) indicator with the most considerable loading factor value (0.858).
e. The best indicator in reflecting Social Networking (X5) is the Indicator of Building Synergy with External Parties (X53), with the most considerable loading factor value (0.869).
f. The best indicator in reflecting student innovation competence (Y1) is the decision-making indicator (Y13), with the most considerable loading factor value (0.923).

Adjusted R2 in this study is 0.730, revealing that the five independent variables can explain the Y1 by 73 %, and other variables beyond the study explain the remaining 27%.

Table 7.
R Square Student Innovation Competencies

	R Square	*R Square Adjusted*
Y1	*0,738*	*0,730*

Inner Model

The original sample value on the results of the inner model test indicates that the direction of influence of the independent variable on the dependent variable. If the value is positive, then the effect is also positive, and vice versa. The T statistics and P values are seen to determine the significance of independent variables' effect on dependent variables. T statistics greater than 1.96 and p-values is less than 0.05 indicate a significant influence between independent and dependent variables. Table 8 explains that:

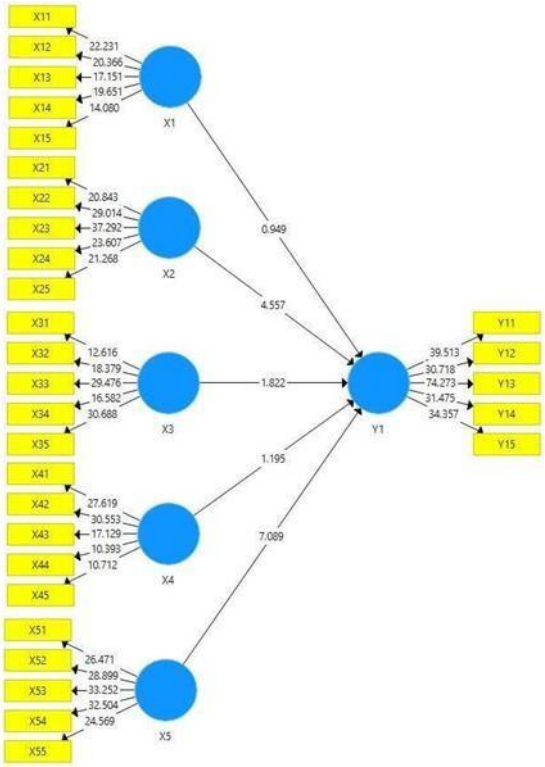
a. The Creativity Variable (X1) has no significant positive effect on Student Innovation Competence (Y1).
b. The Critical Thinking Variable (X2) significantly affects student innovation competence (Y1). When X2 is increased 100%, it will increase Y1 by 28.4% significantly.
c. The Initiation Variable (X3) has an insignificant positive effect on Student Innovation Competence (Y1), while
d. The Teamwork Variable (X4) also has no significant positive effect on Student Innovation Competence (Y1).

Table 8.
Mean, STDEV, T-Values, P-Values Student Innovation Competencies

Relation	***Original Sample (O)***	***Sample Mean (M)***	***Standard Deviation (STDEV)***	***T Statistics (|O/STDEV|)***	***P Values***
X1 -> Y1	*0,089*	*0,089*	*0,094*	*0,949*	*0,343*
X2 -> Y1	*0,284*	*0,286*	*0,062*	*4,557*	*0,000**
X3 -> Y1	*0,144*	*0,143*	*0,079*	*1,822*	*0,069*
X4 -> Y1	*0,067*	*0,071*	*0,056*	*1,195*	*0,233*
X5 -> Y1	*0,432*	*0,428*	*0,061*	*7,089*	*0,000**

*Significant at the level of 0.05 with 95% CI

Figure 3.
Disjoint two-stage Outer Model



Not all variables have a strong and significant influence on student innovation competencies. This study observed 2 (two) variables that are strong and significant influences in shaping student innovation competencies: critical thinking variables (X2) and social networks (X5). In a more detailed description, (1) *for student innovation competency models*, critical thinking variables (X2) are reflected strongest by estimating risk (X23), and *social networking variables* (X5) are reflected strongest by building synergies with external parties indicators (X53).

Based on this research results, it is stated in table 7 that student innovation competency has an R- Square value (model goodness) of 0.730, meaning variables in the model can justify student innovation competence by 73 percent. In comparison, other variables beyond our research variables explain 27 percent.

5. REMARKS

- Conclusion

  Based on the previous discussions, the study revealed two main conclusions, consisting of:

  1. The outer model results of the student innovation development model show that all constructed variables and indicators are reliable and valid. From the inner model result, it is recognized that the model is considered the best since it has an r-square value of 0.730.
  2. Based on the inner model result, two main variables have been identified to have affected the development of student innovation competencies, i.e., critical thinking variables and social networking variables. These variables have significant and strong influence values in driving the improvement of student innovation competencies.

- Suggestion

  The question that should be considered is: what happened that caused only two of the five main variables to have significantly influenced student innovation competency? The following question is: is there a connection with the misalignment between the conceptual, operational frameworks, instruments, and methods used?

  Further research is needed to determine whether only two significant variables with a significant effect are inconsistent results. In the follow-up research, it is necessary to review aspects related to the building of the skeleton based on previous related studies. Then, it is also necessary to look at how to develop the instrument used. Another part to note is the orientation that using PLS-SEM is adequate with the number of respondents included in this study. Alternatively, it could also consider the possibility of increasing the number of respondents and the number of sample universities.

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THE EFFECT OF METHODS PROBLEM SOLVING INTEGRATED THEMATIC- BASEDAND LEARNING MOTIVATION ONLEARNING OUTCOMES SOCIAL STUDIES STUDENTS'IN SD DURING PANDEMIC

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ABSTRACT

In general, the breadth ofmaterial social studies in elementary schools has an impact on students being less motivated to learn. The learning method carried out by the teacher so far is still dominantly using the lecture method. This gives the effect of student understanding of the material and student learning outcomes are inadequate. The purpose of learning social studies (social studies) at the elementary level is that students are expected to be able to have honest, disciplined, responsible, polite, caring, and confident behavior in interacting with family, friends, teachers, and the community and love the homeland. One of the efforts that can be made to makelearning social studies interesting and able to motivate students during a pandemic is to apply anmethod problem solving integrated thematic-based. Through this learning, students are guided to solve a problem in a learning process that integrates several integrated thematic materials. Teachers and students conduct Learning From Home (BDR) assisted bytechnology Google Meet with a series of daily activity materials that can be directly applied by students in their environment. This research is a quantitative research with the type of experimental research and elementary school students as respondents. Preliminary research results show the influence ofmethod problem solving an integrated thematic-based and student learning motivation simultaneously on student learning outcomes in learning. The learning characteristics developed include material packaged in daily life situations by influencing the practice of values and skills on students in interesting and measurable learning activities.

Keywords: *problem solving, integrated thematic, learning motivation, learning outcomes*

1. INTRODUCTION

Education is a person's effort to develop his potential in order to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by himself, society, nation and state. Education is a necessity for everyone. So important is an educated human being that the government obliges every child in Indonesia to attend school. With sufficient education, it is hoped that they will be able to live a better life. An educated society will certainly have an impact on the development of the country.

Humans as social beings really need other people in their lives. Since a person is born until he dies, it cannot be separated from the help of others. Every day we interact with other people. They need each other so that reciprocity occurs. One of the branches of science that studies *social studies* is social science (IPS). In the 2013 curriculum it is stated that the purpose of social studies learning in elementary schools is that students have social attitude competencies, namely "Show honest, disciplined, responsible, polite, caring, and confident behavior in interacting with family, friends, teachers, and neighbors and love the land. water". By understanding *social studies* well, it should be able to shape the character of a society that is honest, disciplined, polite, caring, confident and responsible.

The character that is formed in society is not the result of instant habituation. It takes a continuous and continuous process. This can be started when they are still in school. It is students who are currently studying in educational institutions who must get this habituation so that in the future they become a society that has full awareness and responsibility.

Student learning motivation is an important thing that should not go unnoticed by the teacher when teaching. The amount of motivation of a student will determine the quality of the behavior he displays in learning because it is this motivation that functions as a driver and giver of hope (Hamdani, 2011). A student who has a strong drive to learn will certainly have high hopes in order to understand what is being learned. Thus, of course, it will affect the mastery of the material being studied as well. Through good mastery of the material, of course, it will affect the learning outcomes. Seeing the importance of learning motivation, the learning delivered in class should be able to arouse student learning motivation well. Teachers must understand how important learning motivation is and be able to encourage students to have good learning motivation.

Lessons *social studies* that are delivered in a monotonous teaching style, such as using the lecture method alone or only with assignments. This is because the social studies material is considered very broad and plentiful, so teachers are worried that they will not be able to complete the material on time. In fact, with this method, student activity is very low. With low student activity, it will certainly affect their learning motivation. The lecture method can also cause student boredom while studying so that this will certainly affect the students' learning outcomes of *social studies* . The lack of variation in teacher learning methods in teaching is thought to be the main factor in the low motivation of students to learn so that student learning outcomes are not optimal. For this reason, variations in teaching are needed by applying methods that are in accordance with the characteristics of the *social studies* material. One of the methods that teachers can choose is to use *problem solving*. *Problem solving* according to Hamdani (2011) is a way of presenting lessons by encouraging students to find and solve a problem or problem in order to achieve teaching goals. Through *problem solving* students are trained to face various problems, both personal and group problems to be solved alone or together (Florean, 2016). The learning orientation is investigation and discovery which is basically problem solving. The main purpose of this study is to investigate and examine the basis of problem solving. Social studies subject matter is a study of real daily life, so it is felt that it will be very appropriate if the learning uses problem- solving-based learning.

2. LITERATURE REVIEW AND THEORY

Learning *Problem solving* according to Hamdani, (2011) is a way of presenting lessons by encouraging students to find and solve a problem or problem in order to achieve teaching goals. In this learning activity students are trained to face various problems, both personal and group problems to be solved alone or together. Meanwhile, Djamarah & Zain (2013) revealed that the *problem solving* is not just a teaching method, but also a method of thinking, because *problem solving* can use other methods that start with looking for data to draw conclusions. Through this *problem solving*, it can also stimulate the development of students' thinking skills creatively and thoroughly, because in the learning process, students do a lot of mental work by highlighting problems from various aspects in order to find solutions.

Thematic learning is a form of integrated learning model that combines a concept in several materials, lessons or fields of study into a particular theme or topic of discussion so that there is an integration of knowledge, skills and values that enable students to actively discover scientific concepts and principles holistically, meaningfully and authentically. (Riadi, 2020). According to Tirtoni (2018) integrated learning is the linking of several subjects into one theme. In integrated learning, students can take advantage of the skills developed from studying the interrelationships between subjects. Integrated learning helps students to solve problems and think critically to be developed through skills in real situations or practice.

Motivation or interest in learning according to Hamdani (2011) is a desire to learn from an individual. Students will be able to learn more effectively if they have great learning motivation. This motivation will encourage him to study better and harder than before. Learning motivation can come from within students or be raised, improved, and maintained from external factors. Meanwhile, according to Rachman (2015) motivation is defined as a person's strength (energy) that can lead to a level of persistence and enthusiasm in carrying out an activity, both originating from within the individual itself (intrinsic motivation) and from outside the individual (extrinsic motivation).

In the context of psychological studies, Sondang and Makmun (2004) in Rachman (2015) suggest that to understand individual motivation, it can be seen from several indicators, namely (a) the duration of the activity; (b) frequency of activities; (c) persistence in activities; (d) perseverance, tenacity and ability to face obstacles and difficulties; (e) devotion and sacrifice to achieve goals; (f) the level of aspirations to be achieved with the activities carried out; (g) the level of achievement or product qualification (output) achieved from the activities carried out; (8) the direction of the attitude towards the target.

Through learning, it is hoped that a person's potential can develop to the fullest. The ability from not knowing to knowing, unable to be able. This is as expressed by Yamin (2014) that learning is a conscious human effort to escape as much as possible from ignorance about many things. Learning is engineered in such a way as to be able to become a process of understanding the situation and reality that is still biased in meaning. Yamin (2014) also revealed that learning is an effort to improve the quality of life and optimize the development of human quality that can bring hope for improvement in the future.

Through the learning process, a person is expected to produce more abilities than before learning. Sudjana (2011) suggests that learning outcomes are abilities that students have after they receive their learning experiences. Learning outcomes according to Bloom (1979) in Rusmono (2014) are behavioral changes that include three domains, namely the cognitive, affective, and psychomotor domains. The cognitive domain includes learning objectives related to recall of knowledge and the development of intellectual abilities and skills. The affective domain includes learning objectives that describe changes in attitudes, interests, values, and the development of appreciation and adjustment. The psychomotor domain includes behavioral changes that indicate that students have learned certain physical manipulative skills. From Bloom's thought, Anderson and Krathwohl (2001) in Rusmono (2014) divided the cognitive domain into two dimensions, namely the cognitive process dimension and the knowledge dimension. Dimensions of cognitive processes consist of six levels: (1) memory, (2) understanding, (3) application, (4) analysis, (5) evaluation, (6) creating. Meanwhile, the knowledge dimension consists of four levels, namely (1) factual knowledge, (2) conceptual knowledge, (3) procedural knowledge, and (4) meta-cognitive knowledge.

Learning outcomes are not simply obtained by students. There are several factors that influence the acquisition of student learning outcomes in learning. These factors

can come from within the students themselves (internal factors) or external factors (external factors). Internal factors include physical factors, health factors and psychological factors, while external factors come from parents, schools and society (Nurul, 2020).

The scope of *social studies* teaches students to be able to become the next generation of the future and be useful for the interests of themselves, society, and the nation. For this reason, the scope of *social studies* for elementary schools begins with an introduction to the environment and the closest community, starting at the district, provincial, national and international levels. Between one region to another has a connection. The international environment in elementary school is limited to the introduction of the ASEAN environment subjects *Social studies* aim to produce citizens who are religious, honest, democratic, creative, critical, love to read, have learning abilities, are curious, care about the social and physical environment, contribute to the development of social and cultural life, and communicate productively. The scope of *social studies* consists of knowledge, skills, values and attitudes developed from society and social science disciplines. Mastery of these four contents is carried out in an integrated learning process through a process of reviewing knowledge content (Ministry of Education and Culture, 2017).

Relevant research is used in this study as material to determine the study and determine the differences between this study and previous studies. These other studies include research conducted by Dewi (2021) entitled the implementation of *problem solving* to improve social studies learning outcomes and also research conducted by Hartmann et al. (2021) entitled *preparatory effects of problem solving versus studying examples prior to instruction*. Likewise, research conducted by Pramestika et al., (2020) entitled *creative problem solving* on creative thinking skills and thematic learning outcomes of elementary school students.

3. METHODS

Type of research includes quantitative research with experimental research methods. The main characteristic in experimental research is the control of variables by giving treatment or *treatment* to the experimental group. The treatment given in this research is the application of *problem solving* and learning motivation. The group that uses the *problem solving* is called the experimental group and the group that uses the conventional method is called the control class. Each group will be divided into two categories based on the level of student motivation, namely groups of students with high learning motivation and groups of students with low learning motivation.

The research population is all students at SDN Kebayunan, Tapos District, Depok City. The sampling technique was carried out by random sampling on the sixth grade students at SDN Kebayunan which consisted of 32 students in class VIA and 32 students in class VIB. Group 1 consisted of 32 students of class VIA which were then

divided into two categories, namely children with high learning motivation and children with low learning motivation. The grouping of children based on motivation depends on the results of the learning motivation questionnaire distributed to students before learning is carried out. After that the results of the questionnaire will be calculated as a whole and look for the median value. Students who have scores above the median are declared as children with high learning motivation while children who have scores below the media are declared as children with low learning motivation.

Group 2 consisted of 32 students in class VIB, who were then also divided into two categories, namely children with high learning motivation and children with low learning motivation. This grouping is the same as the grouping in the first group. Then group 1 received treatment by applying an *problem solving* while group 2 was taught using conventional learning strategies.

Data collection techniques in this study using tests, observations, interviews, questionnaires and documentation studies. Sources of data used are primary data and secondary data. Primary data sources were obtained from the results of interviews and observations made during learning with *problem solving* thematic-based *social studies* in class VI SDN Kebayunan, Tapos District, Depok City. Meanwhile, secondary data was obtained from a documentation study in the form of a profile of SDN Kebayunan, *problem solving* , a list of grade VI students' learning outcomes in *social studies*.

The study was conducted during a pandemic with students studying from home. Learning is carried out using Google Meet media and also Google Forms to collect student learning outcomes.

4. RESULTS

Purpose of this study was to determine the effect of the application of *problem solving* based on integrated thematic and student motivation in influencing students' *social studies* . From the student pretest data, it was found that the average pretest score of the experimental class students was 55 for students with high learning motivation and 43 for students with low learning motivation. This shows that the average student still has a low ability in the social studies material. In this initial test, basically students do only what they know. The modernization material presented is material that is familiar to students. It's just that because they haven't learned it, of course they only guess when working on the questions according to their own understanding. After being given treatment in the form of learning using *problem solving* , posttest was then carried out with an average result of 74 for students with high learning motivation and 65 for students with low learning motivation. This shows that there has been a significant increase in *social studies* .

The control class was also given the same test, both pretest and posttest. The mean results of the pretest for the control class were 54 for students with high learning motivation and 50 for students with low learning motivation. In the implementation of control class learning using conventional methods, namely by means of students reading the material independently and then doing practice questions. After learning, the post-test was carried out with an average result of 73 for students with high learning motivation and 54 for students with low learning motivation.

When compared to the average pretest and posttest scores of the two classes, it can be seen that the learning outcomes of the experimental class are greater than those of the control class. This can happen because the experimental class uses an *problem solving* integrated thematic-based Learning is carried out during the pandemic and students study from home, therefore learning is carried out online using the Google Meet application. Even though learning is online, students can still learn actively in class discussions. Learning begins with an overview of the problems that exist around students. The real effects of modernization around students are shown to be material for reflection and the main problem that must be answered by students at the end of the lesson. Students are asked to pay attention to the description of the problem and are then asked to express their opinion. With this direct interaction between teachers, students and learning resources, the level of student understanding is getting better. Through direct viewing and conveying thoughts directly, students have unintentionally been fully involved in learning. Student involvement in learning is a very good thing.

This has also been proven in the research of Chacon & Janssen (2020) which states that *problem solving* can train reasoning skills and hone students' critical thinking skills. Likewise, Rokhman & Ni'matullah (2020) in their research show that the problem-based learning model is a learning approach that presents problems as the initial basis for building students' critical thinking skills by skillfully solving problems in order to gain meaningful knowledge. Another study was conducted by Sari & Zaiyasni (2020) who applied *a problem solving model* in an integrated thematic learning process in grade V elementary school.learning model *problem solving* can improve the integrated thematic learning process on theme 2 in class V.

Thus, the *problem solving* is more effective in improving students *social studies* than conventional methods. This can also be seen from the value of N-Gain in both classes. The N-Gain value in the experimental class is 0.41 in the medium category and the N-Gain value in the control class is 0.23 in the low category. The N-Gain value in the experimental class is greater than the N-Gain value in the control class.

In addition to the applied learning methods, another thing that affects student learning outcomes is the student's own learning motivation. The higher the student's learning motivation, the better the learning outcomes will be. This is indicated by an increase in higher learning outcomes in students who have high learning motivation, namely an increase of 19 points (from an average of 55-74) for experimental class students and an increase of 19 points (from an average of 54-73). for control class students. Meanwhile, for students with low learning motivation, the increase in

learning outcomes was 22 points (from an average of 43-65) for the experimental class students and an increase of 5 points (from an average of 50-54) for the control class. Thus, it shows that the influence of students' learning motivation is very significant on students' social studies learning outcomes in both the experimental class and the control class. Students with high learning motivation had a significant improvement in both classes. Meanwhile, students with low learning motivation in the experimental class showed a significant increase in the average score as well. This shows that the selection of appropriate learning methods will be able to improve learning outcomes even better. In control class students with low learning motivation, the increase in value is not too large. This is certainly influenced by learning that is less interesting so that they are not able to be motivated to learn better.

In line with this, Wijnia & Baars (2021) in their research explained that student motivation can help explain the differences between students who study using *problem solving* and self-assessment skills by watching video modeling examples. This study found that students with good or moderately positive quality profiles learned more from video modeling in terms of problem solving accuracy and student self-assessment than students with poor or moderately negative quality profiles. Likewise, Hartmann et al. (2021) that there are differences in learning outcomes between students who are actively involved in learning from the beginning (have good learning motivation) and students who are not active from the start (have low learning motivation).

From the explanation above, it shows that students' learning motivation and the application of appropriate learning methods will significantly affect student learning outcomes. In this case, the application of *problem solving* as well as the student's motivation to learn is very influential on students' *social studies* . As stated by Sulistiyowatie (2016) that there is a significant influence on student learning achievement by applying *problem solving* and cooperative learning methods both separately and together. Likewise Dewi (2021) who explained that by applying *problem solving* in *social studies* , teachers are able to present innovative learning so that they can increase students' mastery up to 80%.

5. CONCLUSION

Conclusion that can be drawn from the results of the analysis and discussion is an *problem solving* integrated thematic-based *social studies* . This is indicated by the average score of students who apply the *problem solving* is higher than the average score of students who apply conventional methods. Student learning motivation is effective in improving student *social studies* . This is indicated by the average score of students with high learning motivation is higher than the average value of students with low learning motivation learning methods *problem solving* and learning motivation simultaneously are effective in improving student learning outcomes. This is indicated by the average score of students using *problem solving* and having high learning motivation, which is higher than the average score of students using *problem solving* and having low learning motivation.

6. SUGGESTIONS

From the research results that have been obtained, it is recommended for educators to be able to choose the right learning method and in accordance with the learning objectives to be achieved. With a variety of learning methods it will improve the ability of teachers in teaching. Teachers can apply *problem solving* in social studies learning that has broad subject matter and is directly related to students' daily lives. Through this learning method students are trained critically to solve problems that are directly related to life. The impact of this learning will be directly felt by students. By applying an *problem solving* , teachers can improve teaching skills so as to improve student learning outcomes. For policy makers or schools or education offices, it is necessary to encourage teachers to be able to apply various learning methods in schools. Every teacher must be able to continue to develop his teaching competence in order to improve the quality of education in general. For further researchers, they can conduct similar research by examining other variables for improvement from the methodological aspect so that the results are more accurate.

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THE EFFECT FLIPPED CLASSROOM LEARNING MODEL AND STATION ROTATION LEARNING MODEL APPROACH ON THE RESULT OF SOSIAL STUDIES IN ELEMEMTARY SCHOOL ASSESSED FROM LEARNING INTEREST

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ABSTRACT

The purpose of this study was to determine the effect of Flipped classroom learning model and station rotation learning model on social studies learning outcomes in terms of elementary students learning interest. This research uses experimental method with treatment by level design. This research was conducted in the setting of two elementary schools and was divided into two classes. The design of the learning model minimizes direct teaching from teacher (offline) and maximizes indirect teaching with the support of materials that can be accesed online by students. Learning activities condition teachers to act as facilitators in designing online teaching materials in the form of learning videos from everydays themes and can be studied by students at home. The result of this study indicated that 1) There is a difference in the social studies learning outcomes of students who use the flipped classroom learning model which is higher than those who study using the station rotation model (F = 5.14 > 3.11). 2) There is a difference between the learning outcomes of the high learning interest category and the the low learning interest category (F = 3.81 > 3.11). 3) There is an interaction between the learning model and interest in learning on social studies learning outcomes (F=40.62>3.11). 4) Students who have a high interest in learning have higher learning outcomes with the Flipped Classroom model compared to the Station Rotation model (F=80.37 > 3.11) 5) Students who have low interest in learning have higher learning outcomes with the Station Rotation model compared to the Flipped Classroom model (F=71.82>3.11). Flipped Classroom and Station Rotation learning models can be used as learning alternatives during a pandemic with diverse student characteristics in order to create a fun learning atmosphere and avoid learning loss.

Keyword: *Flipped Classroom, Station Rotation, Learning Interest, Learning Outcomes.*

1. INTRODUCTION

Coronavirus Disease 2019 (Covid-19) has had a tremendous impact on all aspects, especially in terms of education and learning activities. Many schools in the world were closed to stop the spread of the virus, including Indonesia. At least about 290.5 million students around the world are disturbed by their learning activities. Based on data from the WHO reported by the worldometer, Indonesia is among the top 10 positive cases in Asian countries. Therefore, the government takes steps not to let learning loss occur and students also continue to receive their right to learn, learning continues even though it cannot be face-to-face but through network (online), outside the network (offline), or blended learning. (combined learning) online and offline.

Efforts to increase interest in learning, teacher competence, participation and creativity of students in the learning process are very much needed during this pandemic when learning from home activities, especially social studies subjects which have quite a lot and complex material. Social studies are considered necessary to be given to elementary school children because social studies is a science in which they learn about doing social interactions, knowledge to interact needs to be provided to students so that later they will blend in in society. However, the fact that teachers often deliver learning materials seems monotonous and knowledge is only focused on the teacher or the teacher only sends assignments via LMS during this pandemic without clear directions to read them, so it is not surprising that many elementary students feel bored with the delivery of social studies material. Things like this should not happen considering that social studies in elementary school as a regulator of the course of lessons should make learning fun.

Social studies lessons in elementary school are very important because they contain material that prepares and educates students to live and understand their world. Because social skills are very important, especially during a pandemic and when learning a combination between online and offline. According to AK Ellis (1991), there are reasons behind being taught social studies in elementary schools including social studies providing a place for students to learn and practice democracy, social studies is designed to help students explain their world, social studies is a means for positive self-development of students, helping students gain basic understanding (fundamental understanding) about geography, and other social sciences, as well as social studies also increase students' sensitivity to social problems. Social Sciences is given in elementary schools because it aims to develop the potential of students to be sensitive to social problems that occur in the community, have a positive mental attitude towards correcting all deviations that occur in society, and are skilled in overcoming every problem that occurs everyday, whether it befalls them. themselves and the community. Social studies has an important influence and role in primary school education, but social studies is still a subject that is "overlooked" for most students. Researchers see that student learning outcomes in social studies subjects are still low, especially in class V SD Negeri Karang Rahayu 01 Bekasi Regency. Social Studies is a subject that until now has not become a preferred subject such as science or social studies subjects.

This can be seen from the social studies learning outcomes which are still low, students' interest in learning during the learning process tends to be less motivated, less active, and even often ignores the duties of the teacher during the teaching and learning process. In the results of the Final Semester Assessment (PAS) II for the 2019/10 academic year, especially social studies subjects, almost 60 percent of the 40 students scored below the Social Sciences Minimum Completeness Criteria (KKM). The value of KKM Social Studies Class V SD Negeri Karang Rahayu 01 is 70. That means there are 24 students whose scores are below 70. Therefore, it is necessary to make efforts to improve the quality of learning, especially social studies subjects so that the meaningfulness and achievement of learning outcomes can be obtained by students class V SDN Karang Rahayu 01 in Karang Bahagia Subdistrict, Bekasi Regency. The various difficulties experienced by educators in distance learning during this pandemic are considering the many obstacles encountered that can hinder learning during the pandemic.

Starting from all of the above, how to overcome these problems requires an educator's creative attitude to create a meaningful and fun learning process atmosphere so that learning objectives are conveyed even though not optimally due to conditions in each area with all its limitations. One way that can be done to increase students' interest in learning is to determine learning models that can increase students' motivation, participation, and activeness in the learning process as well as high interest in learning in understanding the material.

The learning model that is expected to be right during this pandemic is to avoid learning loss which has been almost 2 years for students to learn from home. The selection of learning models must pay attention to the conditions of students, and be varied to realize meaningful learning. Students are not only required to receive material and know something in a limited way, and explore knowledge about social studies subject matter. One of the learning models used during this pandemic is blended learning or a combination learning model. One combination model that is suitable to be applied to elementary school students is the station rotation model or station rotation model. The station rotation model is a series of several learning activities carried out by students in class, where students alternately rotate from one activity to another arranged on different tables (Sarimsakova, 2017: 44).

However, considering the number of Covid-19 patients in Indonesia is getting higher and the restrictions on community activities in Bekasi Regency are getting stricter, the station rotation model is increasingly difficult to implement because time is limited and the visiting teacher program has been limited. Teachers are required to continue to innovate and find solutions for learning models that are more appropriate during this pandemic, especially to improve social studies learning outcomes for class V SD Negeri Karang Rahayu 01 Karang Bahagia Subdistrict, Bekasi Regency. The use of technology is also expected to be able to make students interested in learning social studies. Online learning should be able to present learning media that contains material in an interesting textual, audio, and visual way. In addition, the rapid development of technology and the availability of the internet causes humans to obtain information easily and precisely. Especially with the ownership of a communication tool, namely a smart device that almost all parents and students are used to using.

Teachers must continue to innovate to find learning models that are more appropriate and in accordance with the conditions. Moreover, in social studies subjects there are many materials that students need to understand. With a learning model that contains information in the form of text, images, or videos, it will motivate students to be enthusiastic in learning a combination of online and offline.

This learning model can be said to be a flipped classroom learning model. Flipped Class room is a reversal of traditional classroom learning, namely learning that describes students as recipients of material and teachers who provide material in the classroom. In traditional classes, students only actively receive material. Whereas in the Flipped Classroom model, students can study learning materials at home in the form of text or videos uploaded via the internet on supporting applications such as Youtube, Learning Houses, Active Elementary Schools, Kemdikbudristek and so on. Then the material can be continued in group discussions when face-to-face learning is carried out if there is material that has not been understood and ask questions about materials sent online when limited face-to-face learning takes place.

Based on the background of the problem described above, the problem is formulated as follows, "Is there an interaction effect between learning models and interest in learning with social studies learning outcomes for fifth grade elementary school?"

With reference to the problem, the purpose of this study is "To find out whether there is an interaction effect between learning models and interest in learning with social studies learning outcomes for fifth grade elementary school."

2. LITERATURE REVIEW AND THEORY

Learning outcomes are the attainment of a form of behavioral change that tends to persist from the cognitive, affective, and psychomotor domains of the learning process carried out within a certain time (Jihad and Haris, 2012). Learning outcomes as a change in behavior as a whole are not only one aspect of human potential (Suprijono , 2013). Rusmonol (2012:10) states that "learning outcomes are changes in individual behavior which include the cognitive, affective, and psychomotor domains. This behavior is obtained after students complete the program through interaction with various learning resources and learning environments. That is, after experiencing the learning process, there are behavioral changes that occur in students including cognitive, affective, and psychomotor domains. These changes are then assessed and called learning outcomes.

Learning outcomes according to Nawawi (2013) are defined as the level of success of students in studying subject matter at school which is expressed in scores obtained from test results to know a certain number of subject matter. Furthermore, l Ekawarna (2013: 50) argues that "learning outcomes are a reflection of the knowledge, skills and attitudes acquired by students in participating in the teaching and learning process". Based on the views of several experts, it can be concluded that learning outcomes are the results obtained by students after going through a series of learning activities in which there are aspects of knowledge, attitudes and skills which are expressed in a value symbol and description.

The term Social Sciences is abbreviated as IPS according to Swasono (2013: 20), namely "IPS is the name of the subject at the elementary and secondary school levels or the name of the university study program is identical to the term social studies. The term IPS in elementary school is the name of a stand-alone subject as an integration of a number of concepts from social science disciplines, humanities, science, and even various social issues and problems of life."

According to Trianto (2012:171) "Social Sciences is an integration of various branches of social sciences such as sociology, history, geography, economics, politics, law and culture." Meanwhile, Djahiri in Ahmad Susanto (2012:137-138) explains that "IPS is a hope to be able to build a good society in which its members really develop as rational and responsible social people, so that values are created.."

Toni Nasution and Maulana Arafat Lubis (2018:3) stated that;

> *"Social Sciences is a translation of social studies which are simplified social sciences for educational purposes covering aspects of history, economics, political science, sociology, anthropology, psychology, geography and philosophy which in practice are selected for learning purposes. in schools and colleges. When analyzed carefully, the definition of social studies contains the following: 1) Social studies is a derivative of social sciences; 2) This discipline was developed to fulfill educational goals at the school level and at the tertiary level; 3) Aspects of each of the social science disciplines need to be selected for this purpose."*

Moeljono Cokroadikarjo (2013) argues that social studies is the embodiment of an interdisciplinary approach from social science. Social Studies is an integration of various branches of social science, namely sociology, anthropology, culture, psychology, history, geography, economics, political science and human ecology, which are formulated for simplified purposes so that they are easy to learn.

Social Sciences is a simplified social science lesson for elementary, junior and senior high school education, simplification here means reducing the level of difficulty of social sciences that are usually studied at universities into lessons that are in accordance with the thinking maturity of elementary school students and advanced, and linking and combining materials from various branches of social sciences and community life so that they become easy-to-digest lessons (Soemantri, 2001).

Sumaatmadja (2002:123) argues that "IPS is an educational program which is a whole which basically questions humans and the physical natural environment as well as their social environment whose material is taken from various social sciences such as geography, history, economics, anthropology, and social psychology.

Social studies, which are taught in primary and secondary education, become the basic introduction to studying social studies/social studies or social sciences in universities. Even within the framework they can complement each other. The results of social studies studies can be utilized by social sciences, and conversely the results of social science studies can be utilized by social studies (Sardiyo, Sugandi, Ischak, 2011).

Flipped classroom is a model in which the teaching and learning process is not like in general, namely in the learning process students learn subject matter at home before class starts and teaching and learning activities in class are in the form of doing assignments, discussing, about material or problems that have not been understood (Yulietri et al. , 2015). Flipped classroom is a learning concept on the basis that what is done in conventional learning is done at home, while homework in conventional learning is done in the classroom (Milman, 2012). Flipped classroom is a learning model that minimizes direct teaching from the teacher, but maximizes indirect teaching with the support of materials that can be accessed online by students (Honson, 2013).

Sourced from several expert opinions, the researcher concluded that the Flipped classroom is a learning model that combines learning activities carried out outside or inside the classroom with the aim of maximizing the learning process, in the learning activities the teacher acts as a facilitator in designing or packaging online teaching materials in the form of learning videos which will later serve as material for students to study at home so that students are better prepared to learn when face-to-face classes are conducted.

In the Station Rotation model, students will get more learning resources, namely from two learning environments with different characteristics. The first learning environment is a guided learning environment (face to face) and the second learning environment is an online learning environment. Each of these learning environments has advantages and disadvantages that contradict one another. Therefore, when these two learning environments are combined into one learning environment, it is hoped that the two can complement each other (Adistana, 2016)

Based on the understanding of some of the experts above, it can be concluded that the station rotation learning model is one of the online and offline combination learning models that requires the role of all students. This means that this rotation model is useful for making student communication in one class more focused by providing material on line then rotating at face-to-face spots with the teacher and ending with discussions with fellow students in small groups.

The objectives of the blended learning station rotation model are;

1) help students to develop better in the learning process, according to learning styles and preferences in learning; 2) provide practical, realistic opportunities for educators and students to learn independently, benefit, and continue to grow; 3) Improved scheduling flexibility for learners, by combining the best aspects of face-to-face and online instruction; 4) Face-to-face classes can be used to engage students in interactive experiences. While the online portion provides students with multimedia content that is rich in knowledge at any time, and anywhere as long as students have internet access; 5) overcoming learning problems that require completion through the use of varied learning methods (Pradnyana, 2013).

In Haru (2015) psychology dictionary explained that interest in English is interest which is one of the technical terms of psychology, especially in educational psychology. Furthermore, Djaali (2013) states that interest is a feeling of curiosity, learning, admiration or having something. Then, according to Sadirman (2012) a person's interest in an object will be more visible if the object is on target and related to the desires and needs of the person concerned.

Nashar (2014:42) states that "Interest in learning is the driving force from within the individual to carry out learning activities, increase knowledge and skills as well as experience." According to Sutikno (2013) interest can be identified by signs including:

1) Attention; 2) Interest; 3) Curiosity; 4) Feelings of pleasure. The existence of student interest in participating in learning can be seen from the attitude in studying the learning material. Students with high learning interest tend to focus and pay attention to the teacher's explanations and easily understand the material during teaching and learning activities. The enthusiasm of students to take part in learning indicates an interest in learning in them. Furthermore, Slameto (2013) categorizes indicators of interest in learning into several types, namely: 1) Student attention; 2) Feelings of pleasure; 3) Student concentration; 4) Student awareness; 5) Willingness of students.

Characteristics of Class V Elementary School Students in general ranging in age from 6 to 12 years is a period that is an important and fundamental stage for the development of students. Students begin to develop and find their identity at that time. In the process of developing and searching for identity, students have different characteristics. Susanto (2015: 73) states that "Development in students includes two aspects, namely physical aspects and mental aspects".

3. METHOD

The use of the experimental method used in this study is a quasi-experimental in which the selected subjects are all subjects in the intact group. The method is used on the basis of the objectives to be achieved, which is to find out about the effect of the Flipped Classroom learning model on social studies learning outcomes in terms of learning interest. The implementation of this experimental research was carried out by giving learning to the two groups with different treatments, namely group A1 using the Flipped Classroom learning model and group A2 using the station rotation learning model. The purpose of giving these two lessons is to find out which one has a better effect on student learning outcomes in social studies learning for fifth grade elementary school. The research design used in this study was treatment by level or 2 x 2 factorial design. In this study, there were three research variables, consisting of two independent variables and one dependent variable. The first independent variable is the Flipped Classroom learning model, and the second independent variable is station rotation, the control variable is interest in learning, while the dependent variable is learning outcomes in social studies subjects for fifth grade elementary school.

The target population for the generalization of the experimental findings is all fifth

grade elementary school students in Bekasi Regency, especially in cluster II, Karang Bahagia Subdistrict, Bekasi Regency. While the samples used in this study were fifth grade students at SD Negeri Karang Rahayu 01 and class V students at SD Negeri Karang Setia 01. The sampling procedure was to identify all fifth grade students in Cluster II in Karang Bahagia Subdistrict, Bekasi Regency.

To analyze the data in this study, two-way analysis of variance (Two Way Anova) was used with a 2x2 factorial design or factorial design. To perform data processing with ANOVA, first, the normality test and data homogeneity test were carried out. This model is used to determine the effect of the independent variable on the dependent variable. The several stages of data analysis are as follows; 1) test normality test; 2) homogeneity test; 3) advanced test.

4. RESULTS

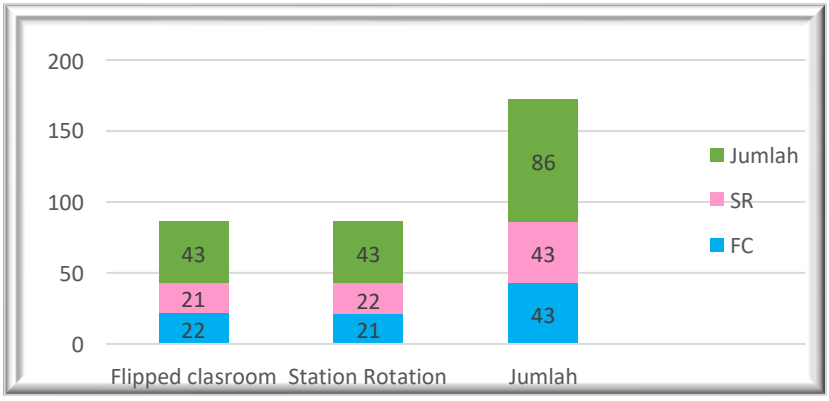
The results of this study were obtained from the results of the post test and data from a questionnaire or learning interest questionnaire. The resulting data is then analyzed and processed so that it can answer the research hypothesis.

a. Data Analysis Questionnaire or Learning Interest Questionnaire

Tabel 1.
Data Analysis

Treatment	High Learning Interest	Low Learning Interest	Total
MModel Flipped classroom	22	21	43
MModel Station rotation	21	22	43
Total	43	43	86

Figure 1.
Histogram of Learning Interest Grouping



Based on the table above, it is explained that the number of students who take part in learning with the flipped classroom learning model is 22 participants with a high

learning interest category and 21 students with low learning interest. Meanwhile, the number of students who took part in the study using the station rotation model was 21 students with high learning interest and 22 students with low learning interest. In total, all students who received treatment were 86 students.

Of the two categories are very influential on learning outcomes. High learning interest in learning with the flipped classroom and station rotation models will greatly affect the social studies learning outcomes for class V theme 7 Events in Life. On the other hand, low interest in learning with the treatment of flipped classroom and station rotation learning models will affect the social studies learning outcomes for class V theme 7 Events in Life. Given the importance of social studies learning in elementary school, which has a very broad scope and the material is related to events or events and can be applied to everyday life, social studies learning in elementary school plays an important role and binds other subjects. Although the 2013 curriculum is still being used during the pandemic and not all educational units use the emergency curriculum module, thematic learning in grade 5 elementary school, especially theme 7, is heavily dominated by social studies material.

Testing Requirements Analysis Normality Test Data

In this study, the group normality test used the Kolmogorov-Smirnov test with the calculation of the SPSS program. The data can be categorized as normal if the results of the Kolomogorov-Smirnov test for each group are greater than the significance level of = 0.05.

Based on the results of the normality test with the SPSS application, the results obtained are that the four groups of data that were treated showed that all data were normally distributed so that they met the requirements for the Two-Way ANOVA test. The results of the normality test of the data in table 4.11 are as follows:

Table 2.

Table of Sample Normality Test Results With Kolmogorov Smirnov Test at = 005

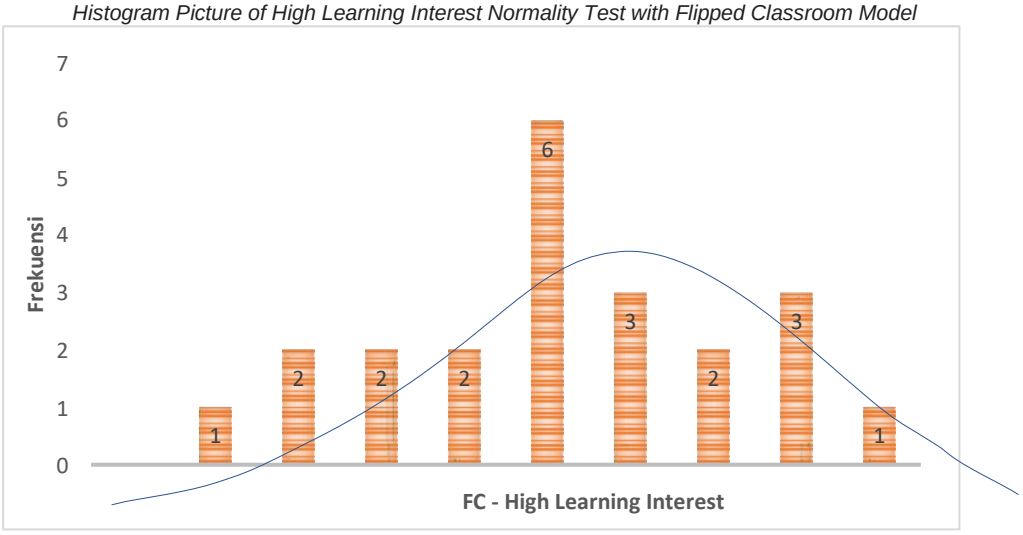
Sampel Group	Total Sampel	Result K-S	α = 0,05	Conclusion
I	22	0,148	➢ 0,05	Normal
II	21	0,104	➢ 0,05	Normal
III	21	0,179	➢ 0,05	Normal
IV	22	0,115	➢ 0,05	Normal

Description:

Group I: Groups of students in the category of high learning interest who are taught using the flipped classroom. learning model.

Figure 2.

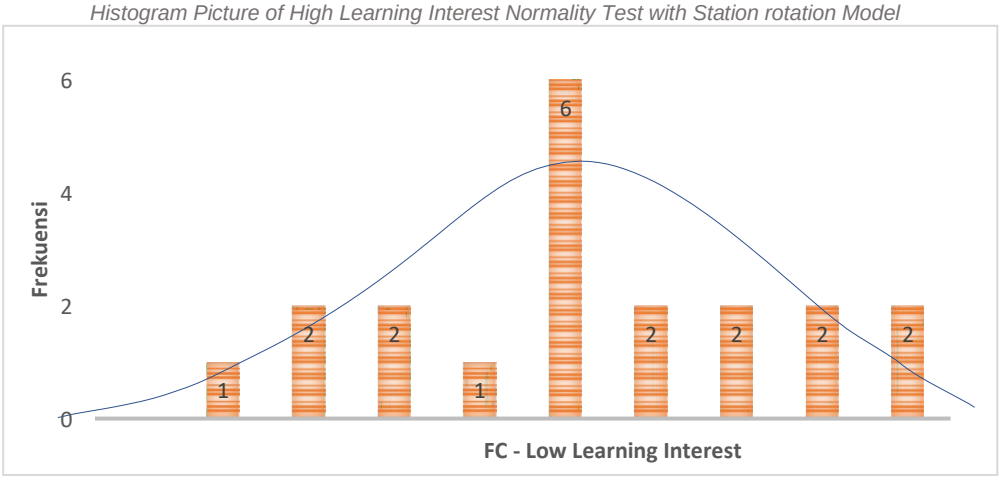
Histogram Picture of High Learning Interest Normality Test with Flipped Classroom Model



Group 2 :The group of students in the category of high learning interest with the station rotation learning model treatment

Figure 3.

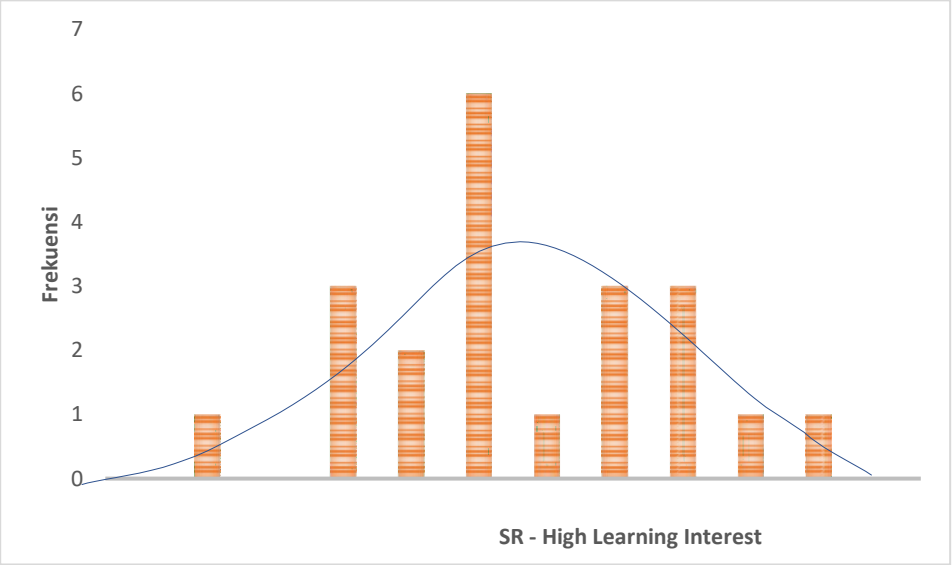
Histogram Picture of High Learning Interest Normality Test with Station rotation Model



Group 3: The group of students in the category of low learning interest who taught using the flipped classroom.

Figure 4.

Histogram Picture of Low Learning Interest Normality Test with Station Rotation Model



Group 4: The group of students in the low learning interest category who Taught using the station rotation model

Figure 5.

Histogram of Low Learning Interest Normality Test with Station Rotation Model

Based on table 4.20 and figure 4.11, figure 4.12, figure 4.13, and figure 4.14, it can be seen that the value of student learning outcomes in social studies learning for class V SD comes from a normal distribution population as seen from the histogram pattern that appears to follow a normal curve so that one of the requirements for the application for Two Way ANAVA has been fulfilled.

b. Homogeneity Test

The homogeneity test of this research was carried out on four groups of data using the Levene test with the help of the SPSS program application as shown in table 4.21 below:

Table 3.

Table of Homogeneity Test Results

Levene's Test of Equality of Error Variances[a]			
Dependent Variable : Hasil Belajar			
F	df1	df2	Sig.
.631	3	82	.597

Based on the data in table 4.21, it can be seen that the significance value is 0.597 > 0.05, which means that the data from the study is homogeneous. This means that the Two Way ANOVA test can be continued.

5. HYPOTHESIS TEST

Hypothesis testing was carried out using two-way Analysis of Variance (ANAVA). Furthermore, to find out which group was significantly superior, further tests were carried out with multiple comparison analysis, namely the Scheffe test.

The results of the calculation of data analysis using two-way ANOVA for student learning outcomes in social studies learning Theme 7 Events in Life can be seen from table 4.

Table 4.

Table of Two Ways ANOVA Calculation Results From Social Studies Learning Outcomes Theme 7 Events in Life

Sumber Varians	Dk	JK	JRK	F_{Hitung}	F_{Tabel} $\alpha = 0,05$
Learning Model	1	492,595	492,595	5,14	3,11
Learning Interest	1	364,967	364,967	3,81	3,11
Interaction Learning Model and Learning Interest	1	3894,936	3894, 936	40,62	3,11
In group	86	7863,446	95,896		

The results of the calculation of data analysis with the Scheffe test for student learning outcomes in social studies learning are in the following table:

Table 5.

Table of Scheffe Test Results Social Studies Learning Outcomes Class V Theme 7

Result				
Scheffe[a,b]				
		Subset for alpha = 0,05		
Kelompok	N	1	2	3
Flipped – Low Learning Interest	21	62.48		
Station R- High Learning Interest	21	63.14		
Station R- Low Learning Interest	22		71.82	
Flipped- High Learning Interest	22			80.73
Sig.		.997	1.000	1.000

Based on the calculation results in the table above, it can be explained as follows:

a. Differences in Social Studies Learning Outcomes Between Students Who Are Taught With The Flipped Classroom Learning Model And Those Who Are Taught With The Station Rotation Learning Model

Based on the results of the ANOVA calculation, it is explained that Fcount = 5.14 which is greater than the value of Ftable = 3.11 so that it can be concluded that there is a significant difference in influence between the flipped classroom learning model and the station rotation learning model, there are social studies learning outcomes for class V theme 7 Events in Life.

Based on the data on learning outcomes, the average value obtained by the group of students who were taught using the flipped classroom learning model (x=71,81) was higher than the average value obtained by the group of students who were taught using the station rotation learning model (x=67). ,58). Based on the average value of the two learning models, it can be concluded that students who use the flipped classroom learning model are better than students' learning outcomes with the station rotation learning model treatment of social studies learning outcomes Theme 7 Events in Life.

b. Differences in Social Studies Learning Outcomes of Students Based on Categories of High Learning Interest and Low Learning Interest.

Based on the results of the ANOVA calculation, it can be seen that fcount 3.81 which is greater than the value ftable = 3.11, so it can be concluded that there is a difference in the effect of high learning interest and low learning interest. There are social studies learning outcomes with the theme of 7 events in life.

From the calculated data, the average value obtained by the group of students with high learning interest (x=72.14) was higher than the average value obtained by the group of students with low interest in learning (x=67.26). From the two average values, it can be concluded that students' interest in learning has an effect on learning outcomes for Social Sciences Theme 7 Events in Life. High learning interest will determine higher learning outcomes than students who have low learning interest.

c. Differences in Thematic Learning Outcomes of Students in the High Learning Interest Category between those taught with the Flipped Classroom Learning Model and the Statio Rotation Learning Model.

Based on the results of the Scheffe test, it was explained that the results of the group of students who had high interest in learning with the treatment of the flipped classroom learning model the results showed (α = 80.73), while the group of students in the category of high learning interest with the treatment of the station rotation learning model the results were (α = 63.14).

Thus it can be concluded that students who have a high interest in learning do learning with the treatment of the flipped classroom model and obtain better learning outcomes than students who are treated with the station rotation learning model. High interest in learning becomes a control variable for the learning model that supports this group of students.

d. Differences in Social Studies Learning Outcomes for Students in the Low Learning Interest Category with the Flipped Classroom Learning Model and the Station Rotation Learning Model.

Based on the results of the Scheffe test, it can be seen that the results of the group of students in the low learning interest category using the flipped classroom learning model the results are (α = 62.48), while the group of students in the low learning interest category using the station rotation learning model has a result of (α = 62.48). =71.82). Thus, it can be concluded that the learning outcomes of students who have low interest in learning get social studies learning outcomes which tend to be better with the treatment of the station rotation learning model compared to students who are taught with the flipped classroom learning model.

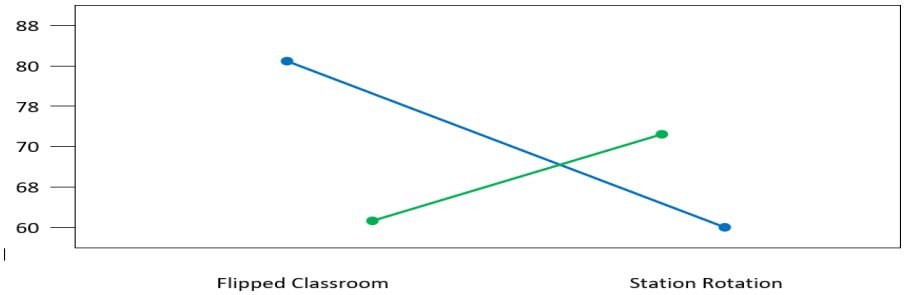
e. The Effect of Interaction Between Learning Models and Learning Interests on Students' Learning Outcomes in Social Studies Learning

Based on the results of the Two Way ANOVA calculation, it can be explained that the fcount value is 40.62. While the ftable price for the 0.05 significance level is 3.11. Because the value of fcount is greater than ftable (40.62) > 3.11. Thus, it can be seen that there is an interaction between the learning model and interest in learning which has an influence on the understanding and ability of students in social studies learning.

The interaction between the learning model and interest in learning can be seen in picture 4.15

Figure 6.

The interaction between learning models (flipped classroom and station rotation) and learning interest (category of high learning interest and low learning interest) on social studies learning outcomes for class V Theme 7 Events in Life.



The results showed that there were differences in social studies learning outcomes between students who were taught using the flipped classroom learning model and the station rotation learning model. Overall, students who use the flipped classroom learning model get higher social studies learning outcomes than students who are taught using the station rotation learning model. This is because learning outcomes will increase if teachers choose the right learning model with pandemic conditions, the selection of learning models and interest in learning have an effect on a pleasant learning atmosphere during the pandemic.

The choice of learning model and interest in learning will determine maximum learning achievement. The flipped classroom learning model is a traditional class reversal model, meaning that it means reversing the atmosphere of learning in the classroom outside the home with the aim that learning continues and students can interact with material that is not understood through applications used by teachers or youtube video links. The implementation of the flipped classroom learning model is an alternative model that can be used during a pandemic because it is included in a combination or blended learning model. It is very possible to do it compared to the station rotation learning model because at this time what requires schools in Bekasi Regency to limit face-to-face learning is limited.

6. CONCLUSION

From the research results, there are differences in the learning outcomes of Social Science students who use the Flipped Classroom learning model, differences in the learning outcomes of Social Science students who use the Station Rotation learning model and differences in Social Science learning outcomes based on high learning interest and low learning interest in The Flipped Classroom learning model and the Station Rotation learning model can be concluded as follows:

a. There are differences in social studies learning outcomes between fifth grade students who have high learning interest and low learning interest.
b. Social studies learning outcomes of students who study using the Flipped Classroom learning model are higher than those of students who use the Station Rotation learning model.
c. Social studies learning outcomes of students who have a high interest in learning by using the Flipped Classroom learning model are higher than students who study using the Station Rotation learning model.
d. Social studies learning outcomes of students who have low interest in learning by using the Station Rotation learning model are higher than students who use the Flipped Classroom learning model.
e. There is an interaction between the Flipped Classroom learning model and the Station Rotation Learning Model on students' social studies learning outcomes in terms of learning interest.

7. SUGGESTION

Based on the research results and conclusions, the following suggestions are submitted:

a. Flipped Classroom and Station Rotation learning models can be used as alternative learning models during the pandemic to support social studies learning in elementary schools with diverse student characteristics in order to create a fun learning atmosphere and avoid learning loss.
b. Teachers are expected to be able to innovate and be creative in creating an atmosphere of distance learning and/or limited face-to-face learning without eliminating the learning objectives, but students are not bored in receiving material in the midst of a pandemic.
c. The flipped classroom and station rotation learning models require teachers to be more skilled in the use of information technology in the 21st century and during the current pandemic.
d. Research on the flipped classroom and station rotation learning model is recommended to be continued with research subjects, other wider control variables, with different subjects.
e. In researching the flipped classroom or station rotation learning model, it is best to determine which comparison model is appropriate to study which is more effective during a pandemic and when face-to-face learning is limited.
f. Based on the findings of the research that there are still many problems and obstacles in achieving learning outcomes due to the use of inappropriate learning model is more appropriate and control variables what to wear.

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DEVELOPMENT OF THE ASEAN ENCYCLOPEDIA MEDIA TO IMPROVE STUDENTS' LEARNING OUTCOMES IN CLASS VI SOCIAL STUDIES LEARNING AT SDN GROGOL SELATAN

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ABSTRACT

When the Covid-19 pandemic hit the world, the learning program in schools underwent many changes. The learning process carried out by the teacher has an impact on the use of electronic books, learning videos and Google Meet technology being more dominant. The results of interviews and student questionnaires found several problems in distance learning related to mastery of material about ASEAN. The competencies that are expected to be at least elementary school students must be able to master the ASEAN material as one of the regional understanding abilities. Based on these findings, there is a need for innovation in the development of more meaningful learning media. The design of the ASEAN encyclopedia learning media that was developed contains more on the visual characteristics of images and forms of cooperation between countries. The picture material and content are packaged in a unified theme that can provide an analysis of cultural, economic, social geography space and values of togetherness between nations. Furthermore, the encyclopedia is also made into an easily accessible e-encyclopedia. The study used the ADDIE development model which was carried out in five steps, namely analysis, design, development, implementation, and evaluation. The results show that the ASEAN encyclopedia learning media product can be used as a more comprehensive social studies learning media and can improve students' skills in regional studies through simulations and virtual role playing.

Keywords: *Learning media, ASEAN encyclopedia, social studies, learning outcomes*

1. BACKGROUND OF THE PROBLEM

According to Law No. 20 of 2003 education in Indonesia is carried out based on the 2013 curriculum which began to be implemented in the 2013/2014 school year. The 2013 curriculum wants students to have soft skills and hard skills consisting of attitudes, skills, and knowledge competencies so that they become creative, innovative, and characterized students. This is in accordance with the statement of Ahmad Yani and Mamat Ruhimat (2018: 42) that the skills that must be mastered by students are divided into two, namely hard skills and soft skills.

The 2013 curriculum is applied in the learning process in schools. Learning according to Gestalt in A.Rusdiana & Yeti Heryati (2015:146) is a teacher's effort to provide learning materials in such a way that it is easier for students to organize (organize) into a meaningful pattern. Learning is an interaction between students and teachers that has been planned so that it becomes a regular activity and causes students to have changes in behavior. Teachers need to create a learning environment that supports the learning process.

According to Jarolimek (1993) in Sapriya: 165 suggests that the basic goal of learning by utilizing picture aids, for example, is that the message conveyed is truly accurate. Another factor to consider is that pictures, photos, or illustrations should be appropriate for the developmental level/age level of the student.

According to Piaget, the stage of cognitive development in elementary school students is in the concrete Operation stage 7-11 years, namely the child's thinking process must be concrete, not abstract. At this time in solving problems children use concrete or physical logic and can arrange categories based on hierarchies.

Elementary school students are also at the formal operational stage aged 11 years and over, namely the thinking process at this time has begun to abstract, complex reasoning has begun to be used, and has been able to test a hypothesis in mentality (Nana Syaodih, 2009 in Dr.H.Sutirna, M. Pd, 2013:29). In essence, it can be concluded that the older the child, the higher the ability to think and the sharper the level of understanding in reading. (Sapriya; 2017:159) By paying attention to the students, the teacher will be able to arrange a good learning implementation that is adjusted to the level of students' cognitive development.

In the learning process, various types of experiences can be obtained. As previously mentioned, Edgar Dale suggests a hierarchy of learning experiences based on the degree of concreteness and abstraction. Edgar Dale in the cone of his experience said that verbal symbols are the most abstract symbols because language is basically abstract, so teachers need to draw models, models of actual objects in presenting a particular lesson. Students will be able to understand / understand what is conveyed by the teacher. (Rayandra Asyar:2011:3) . In learning the teacher needs to use the help of learning media such as pictures that can clarify the material presented.

According to Sapriya:164 the most widely used visual aids in books are pictures, photos, and illustrations. It is used to obtain a picture that is like the original and looks real, expresses thoughts, remembers the actual object, and provides meaning in learning. This effort is made because words alone are not enough to convey messages or meanings accurately, precisely, and quickly like pictures. Pictures can also help in improving inquiry skills so that good social studies textbooks today are those that contain a number of pictures accompanied by a number of questions, not just a description of the content of the picture or illustration.

Various tools can be used by teachers to convey teaching messages to students through sight and hearing to avoid verbalism that may still occur if only visual aids are used. In an effort to use the media as a tool, Edgar Dale qualifies experience according to levels from the most concrete to the most abstract. This classification of experience is better known as the cone of experience (Usman, 2002; 21). The classification of experiences is widely followed by educators in determining what tools should be appropriate for a particular learning experience. (Musfiqon: 2012: 41-42).

Learning in elementary schools includes Social Science subjects. Social Sciences are subjects taken from various social sciences. In social science lessons students learn social knowledge such as theories, cases, and examples of events that occur in society. Social Studies is an understanding of concepts related to society and the environment. Social studies examines a set of events, facts, concepts, and generalizations related to social issues, making social studies difficult to learn.

Previous research conducted by Rusmawan (2013: 286) stated that quite a lot of students had difficulties in learning to master social studies material. Difficulties in learning social studies are caused by the low level of student interest. Students' low interest in social studies is also evidenced by the low interest in reading in social studies subjects. According to Adiwiyarso (2008:1) in Rusmawan (2013) suggests that "quite a lot of students have difficulty in learning to master social studies teaching material is more due to low reading levels, as well as student dependence in learning to teachers."

Based on the results of a survey from the Program for International Student Assessment (PISA) in 2015 - 2019 that the reading ability of Indonesian children aged 15 years in the international world is at an unsatisfactory level and places Indonesia in the lowest rank in OECD countries. In 2018-2019 Indonesia was ranked 72 out of 77 countries with a score of 371. In 2015 the reading score was 397. If you see there is a decrease in student interest in reading in 2015 and 2018.

One of the materials in Social Studies subject for class VI is ASEAN. ASEAN was established on August 8, 1967. Based on the 2013 curriculum, the ASEAN material studied by grade VI students is about geographical characteristics and socio-cultural, economic, political life in the ASEAN region, and Indonesia's role in cooperation in the fields of economy, politics, socio-culture, technology, and education within ASEAN. ASEAN material is contained in themes 1, 4, 5, 7, and 8 so that this material is taught intermittently.

The decline in students' interest in learning the ASEAN material is that learning is more teacher-centered. Students are not involved in the learning process. Students only listen to the teacher explain and then take notes on the material presented by the teacher. So that in learning some unpleasant events were found. Based on research conducted by Setiawan (2013: 4) that learning Social Sciences is very boring so that bad behavior occurs during the learning process such as truancy, leaving class when given the task of taking notes, falling asleep or falling asleep when the teacher explains, playing cellphone during assignments. taking notes or when explaining, and chatting with a classmate. This happens because the teacher always uses the lecture method. Teachers are not varied in carrying out the learning process, for example, teachers only use the lecture method or ask students to take notes (Puskur: 2007: 6).

According to Nunuk Suryani, Achmad Setiawan and Aditin Putria: 2018:9 in (Asyhar 2011) the use of media can improve students' memory because media can increase students' attention and motivation towards learning materials. In teaching chemical element symbol material, the teacher uses media images, element cards, diagrams, photos, videos and so on rather than simply explaining the names of these chemical elements verbally so as to minimize conceptual errors in students.

Based on the results of researcher interviews with 2 sixth grade teachers that the low learning outcomes of students on ASEAN materials are caused by students lazy to read books, the material is too broad while learning time is small, ASEAN material is taught intermittently because the material is contained in different theme books. different, so when students are asked about ASEAN material that they previously forgot, teachers find it difficult to get learning media with ASEAN material. Based on the results of interviews, daily tests, and questionnaires, there are problems in ASEAN learning, namely many students get scores that do not reach the KKM during daily and semester tests. This is because students are not interested in ASEAN lessons. Before the Covid 19 Pandemic, many students were not interested because teachers only used the lecture method, books provided by the school, and did not use learning media. During the Covid 19 Pandemic, teachers used books provided at school, learning videos as learning media and google meet but many students got scores below the KKM. Based on the results of interviews and student questionnaires, there are several problems in distance learning in ASEAN learning, namely students' understanding of the material is lacking if it is not explained by the teacher directly, the signal is sometimes difficult, the quota runs out so they can't play learning videos, students just watch it so students don't understand the material, parents cannot accompany students because of work so there is no one to help students when studying, there are too many things that must be memorized such as state conditions, country results, and forms of cooperation between ASEAN countries. Based on these problems the researchers developed a learning media in the form of an encyclopedia.

Based on the results of previous studies and interviews, the researcher wants to develop an encyclopedia learning media. Researchers will develop an encyclopedia learning media that is valid, interesting and in accordance with the development of class VI students.

In line with previous research and to overcome the problem of social studies learning, especially on ASEAN material, the researcher wants to try to develop an encyclopedia media and is expected to be able to change the memorization pattern of students into a pattern of understanding. The ASEAN encyclopedia media is a learning media that presents ASEAN material that is equipped with pictures, colors that are designed as attractive as possible so that students are interested, and do not feel bored. This encyclopedia can be used as an e-encyclopedia so that it can be used in distance learning. Based on the background, the researcher will develop an encyclopedia learning media for grade VI elementary school.

By using developed media that is tailored to the needs of students and teachers in the classroom, it is expected to increase the effectiveness of learning which leads to increased student learning outcomes. There are two main reasons for the importance of developing learning media. The two reasons are as follows:

a. Limited media such as print media which requires a lot of money for printing and distribution, or computer-assisted media which requires adequate computer equipment and the ability of qualified students and teachers. For this reason, existing media can be developed or collaborated to overcome various limitations.
b. As the actualization of teachers in developing learning media from their abilities, as stated in the Regulation of the Minister of National Education Number 16 of 2007 concerning Academic Qualification Standards and teacher competencies, it is explained that teachers must utilize information and communication technology for learning purposes. Teachers also use information and communication technology to communicate and develop themselves. Government Regulation of the Republic of Indonesia Number 74 of 2008 concerning teachers article 3 paragraph 4 which states that one of the pedagogic competencies that must be mastered by teachers in managing student learning is the use of learning technology.

Based on the background of the problem, the research questions that will be elaborated are:

a. What are the steps for developing the ASEAN encyclopedia learning media for social studies subjects for class VI?
b. How is the feasibility of the ASEAN encyclopedia learning media on social studies subjects for class VI being developed?
c. How effective is the use of ASEAN encyclopedia learning media in social studies subjects for class VI?

This study intends to provide an overview of appropriate ASEAN encyclopedia learning media used in learning and can improve the learning outcomes of sixth grade elementary school students in social studies learning.

Research methodology

To develop this research, the researcher used the ADDIE model. The ADDIE model is a model that provides opportunities for learning design developers to collaborate with content, media and learning design experts to produce good quality products. There are 5 stages in the implementation of the ADDIE model development, namely: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation.

The subjects of this study were sixth grade students of SDN Grogol Selatan 05 with different backgrounds. Both differ in students' abilities, parents' educational and occupational backgrounds, as well as differences in distance traveled and means of transportation used to go to school, and 6th grade teachers.

Instrument is a measuring tool to collect data. The instruments used in this research and development are interviews and questionnaires. At the stage of needs analysis using interview instruments. At the product validation stage, media experts, material experts, and also linguists use a questionnaire instrument. At the trial stage using face to face and field trials using a questionnaire.

The instruments to be used are:

a. Needs Analysis Instrument

   This instrument contains questions that aim to determine the needs of teachers in learning social studies material for ASEAN in class VI so that the encyclopedia media developed is in accordance with the needs.

b. Expert Test Questionnaire

c. Product Trial Questionnaire for Students

   This feasibility test instrument will be shown to students as objects that will use the encyclopedia media product that has been developed. The product instrument grid for users at the Face to face trial phase, which consists of three students, is as follows:

   The next instrument grid is the product instrument grid for users at the Field Trials field test phase which will be tested on 28 students. There is also a grid of instruments as follows which were made and adapted to the needs of researchers in formative evaluation.

Development Procedure

The development procedure in this development research follows the steps instructed in the ADDIE development model including the following:

The development procedure in this development research follows the steps instructed in the ADDIE development model including the following:

a. Analysis (analysis)

   The purpose of this analysis is to clearly define the details of the program or design. At this stage the researcher analyzes matters related to the development of the encyclopedia, including:

b. Curriculum analysis

   Curriculum analysis is done by reviewing the curriculum used. This is so that the developed encyclopedia can be used by various schools and is not based on a particular school curriculum. The things that are analyzed in the curriculum are the basic competencies that are expected, and the indicators that students must achieve in the ASEAN material.

c. Needs analysis

   Needs analysis is carried out by analyzing the characteristics of students aiming to identify the characteristics of students according to their level of education. In this study, researchers examined references that discussed the psychological development of sixth grade elementary school students. In addition, researchers also conducted interviews with teachers. It is considered important to know the level of students' ability, motivation, and other aspects. The results of student analysis are used to determine whether elementary students are suitable for using the ASEAN encyclopedia learning media.

d. Analysis of the development of teaching materials

   The analysis of the development of teaching materials is carried out by reviewing references that discuss aspects that need to be considered in the development of teaching materials so that they can be classified into proper and good teaching materials. In this analysis, an assessment is carried out on aspects to create and develop a good encyclopedia, namely those that meet the feasibility aspects of the content of the material, the media feasibility aspects, and the language feasibility aspects. In addition to the encyclopedia aspects, an analysis of the scientific-based learning model is also carried out which is the basis for the encyclopedia to be developed, so that the ASEAN encyclopedia on social studies subjects will be obtained for the sixth grade students of SDN Grogol Selatan 05.

Design (design)

After the analysis stage, the ASEAN IPS encyclopedia is designed. Activities carried out at the planning stage are:

a. Prepare reference books related to the material

b. Compile a map of encyclopedia needs

c. Encyclopedia design drafting

The research design for the development of the ASEAN encyclopedia is carried out in the following steps:

a. Determining the title of the encyclopedia

b. Determining the design of the encyclopedia

The steps to be taken in writing an encyclopedia are as follows.

a. Formulation of basic competencies that must be mastered, namely basic competencies derived from the 2013 content standards.
b. Design from the media side
c. Preparation of material topics
d. Determine attractive colors and images to support learning
e. Determine the writing structure
f. Preparation of assessment instrument design

An encyclopedia assessment instrument was developed to assess the validity, practicality and effectiveness of the encyclopedia. The validity of the encyclopedia will be assessed by three experts, namely a material expert, namely someone who masters social studies learning materials and concepts who are competent to provide an assessment related to the feasibility of content and presentation of material, a media expert is someone who masters media theory and concepts and is competent to provide an assessment of the feasibility of design, presentation and presentation. ASEAN materials are made, and a linguist is someone who masters the material and concepts of competent grammar who provides an assessment and feasibility of using the language contained in the ASEAN encyclopedia learning media with the approval of the supervisor.

Instruments for assessing the accuracy of the design or learning design, the accuracy of the content of teaching materials, and the attractiveness of the encyclopedia in the form of a questionnaire filled out by teachers and students. Before being used in encyclopedia assessment, the assessment instrument that will be developed will be validated first.

Development

According to Benny (2016:133) there are two important goals that need to be achieved in carrying out the development steps, namely: (1) producing, buying or revising teaching materials that have been formulated previously, and (2) choosing the media or media combination that will be used to achieve this. learning objectives. Therefore, the activities carried out at this stage are:

a. Encyclopedia draft writing

At this stage, an initial encyclopedia product will be obtained with the following specifications:

1. Set the title of the encyclopedia.
2. Determine the final goals that students will achieve after they finish studying the encyclopedia.
3. Establish specific capabilities that support the ultimate goal
4. Define the outline of the encyclopedia
5. Develop material by referring to the encyclopedia
6. Review the draft of the resulting encyclopedia
7. Generate a draft encyclopedia

b. Development of assessment instruments and student response questionnaires

The development of the assessment instrument is based on the points of a good LKS requirement. In addition, a student response questionnaire containing points of good teaching materials was also developed.

c. Development of test questions

The development of test questions is based on core competencies and basic competencies based on the material.

d. Product Validation

According to Sugiyono (2019:414) this stage aims to determine the validity of the product developed both from the media and material aspects. Product validation is carried out by expert lecturers, data about product deficiencies or weaknesses will be obtained. These shortcomings will then be corrected by the researchers.

e. Revision

The revision of the ASEAN encyclopedia is carried out based on editing and suggestions for improvement by experts. Based on the results of the assessment, if the encyclopedia has been declared valid, the module is ready to be tested in learning.

2. IMPLEMENTATION

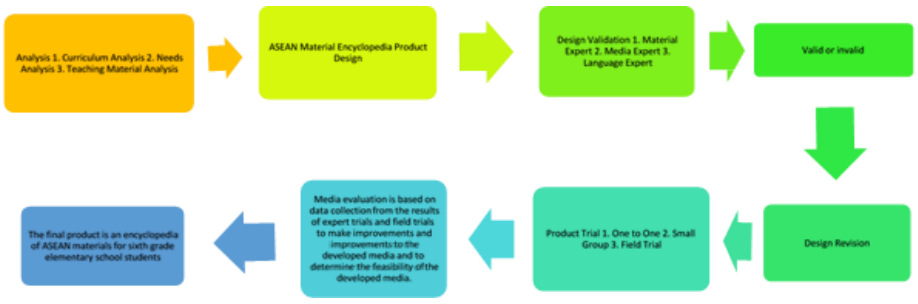
The ASEAN Encyclopedia that has been validated is then tested on students. For student trials, there are three stages that will be given to individuals (one-on-one evaluation), small group evaluation (small group evaluation), and field evaluation (field evaluation) carried out by role playing. This stage will analyze the accuracy of the design or learning design, the accuracy of the content of teaching materials, the attractiveness, and effectiveness of the encyclopedia developed for students. The results of the student and teacher response questionnaires are used to measure the accuracy of the design or learning design, the accuracy of the content of teaching materials and the attractiveness of the encyclopedia and can be used as a reference for improving the encyclopedia.

3. EVALUATION

Evaluation is a process carried out to provide value to the product. At this stage, an evaluation of the quality of the product resulting from the development of teaching materials will be carried out based on the results of teacher and student response questionnaires as well as expert opinions. After being evaluated, the final revision of the product will be carried out which will produce final results that are suitable for use in learning.

The following is the flow of the stages of developing and researching ASEAN material encyclopedias as social studies learning media.

Figure 1.



Data analysis technique

The data that must be analyzed in this study are in the form of a media expert validation questionnaire, material, language and teacher and student responses. The measurement scale of the ASEAN encyclopedia development research used by researchers is by using the Likert scale. The Likert scale is referred to as a measuring tool for something that is expressed through a series of statements that will be given to respondents to provide answers. The scoring on the validation instrument data analysis can be seen in the following table:

Table 1.

Scoring Table of Validation Instrument Analysis

No.	Answer Options	Score
1	Very precise, very appropriate, very clear, very interesting, very easy.	5
2	precise, appropriate, clearly interesting, easy.	4
3	Quite precise, quite appropriate, clear enough, interesting enough, easy enough	3
4	less precise, less appropriate, not very clear, not interesting, not easy	2
5	Very imprecise, very inappropriate, very unclear unattractive, very uneasy	1

The percentage formula used is as follows:

$$\text{Eligibility} = \frac{\text{total score obtained X 100\%}}{\text{Maximum score}}$$

The results of the assessment scores from each material expert, linguist, and media expert were then averaged to determine the validity and feasibility of the encyclopedia.

The following is the eligibility criteria for the average analysis shown in the table. Table of Eligibility Validation Criteria.

Table 2.

Quality Score	*Eligibility Criteria*
0 – 25	*Very unworthy*
26 – 50	*Not feasible*
51 – 75	*Decent enough*
76 – 100	*Very worth it*

The percentage formula used is as follows:Eligibility = $\frac{\text{Total score obtained x 100\%}}{\text{Maximum score}}$

4. CONCLUSIONS AND RECOMMENDATIONS

The process of research and development of learning media in the form of encyclopedias on ASEAN grade VI SD material is carried out using ADDIE carried out in five stages. This product development research is carried out by collecting information, product design, validation tests of material experts, linguists, design experts and field tests, the assessment is carried out by educators, one to one assessment is carried out by 3 people who have different levels of thinking, a small-scale trial conducted by nine students, and a large-scale trial assessment conducted by all 6th graders in the lesson. After learning is complete using learning media in the form of an encyclopedia, students are asked to provide comments on the products developed and the responses shown are positive. Students' responses to the products developed can make learning fun. The goal to be achieved in the development of this product is to produce learning media that are innovative and suitable for use for learning. The development of this learning media is presented with an attractive appearance and is related to the material, so that it can attract the attention of students in learning. The product developed by the researcher is expected to help students to be more active in learning in the classroom.

Based on the methodology of developing learning media in the form of encyclopedias on ASEAN grade VI SD material, the next steps for further product development are as follows:

Learning using encyclopedia learning media can be developed by educators on an ongoing basis for different materials.

Learning media in the form of ASEAN encyclopedia class VI SD can be tested on different research subjects.

There are obstacles that researchers will face in making learning media in the form of encyclopedias on ASEAN grade VI SD material which will be an improvement for researchers that may be faced by developers who make encyclopedias on other materials such as words and pictures that are in accordance with the material.

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READING ALOUD ACTIVITIES IN ENHANCING STUDENTS' READING LITERACY SKILLS IN YOUNG LEARNERS' ONLINE LEARNING

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ABSTRACT

Indonesia was placed in the 72nd of 78 in the students' reading literacy surveyed by the Programme for International Student Assessment (PISA) in 2018. There should be numerous efforts made by related parties in education to make the students' reading literacy much better. Teachers as the agents of change can facilitate students by promoting some activities related to the reading skills in their classrooms. One of them is the reading aloud activities that can explore the students' reading literacy skills. Thus, this study is aimed to investigate the reading aloud activities that were done in one of the elementary schools in Kabupaten Bandung Barat. It used a qualitative research design that involves 35 students and their parents from Grade 1 to Grade 3. The instruments that had been applied in collecting the data included participant observation in the WhatsApp group and the questionnaires administered to the students' parents who had guided their children in following the learning. The results show that the students could do the reading aloud activities well, and the parents gave positive responses toward the activities. Therefore, it can be concluded that reading aloud activities can be one of the alternative ways in facilitating young learners to enhance their reading literacy skills.

Keywords: *reading aloud, literacy skill, literacy, young learners, online learning*

1. INTRODUCTION

Reading literacy is one of the literacy skills that need to be mastered by students since it can enlarge their knowledge and sharpen their critical thinking. Additionally, it is a cognitive ability that can be used when interacting with written texts (Urquhart & Weir in Liu, 2010). Nevertheless, Indonesia was placed in the 72nd of 78 in the students' reading literacy surveyed by the Programme for International Student Assessment (PISA) in 2018 (OECD, 2018). Therefore, the students' reading literacy skills should be improved and facilitated even from early age.

As a matter of fact, the Indonesian government has made continuous efforts to increase the students' literacy skills in all levels of educations by establishing Gerakan Literasi Nasional (National Literacy Movement) since 2016 (Kementerian Pendidikan dan Kebudayaan RI, 2016). It includes the school literacy movement, the family literacy movement, and the society literacy movement. However, the reading literacy skills of the students, in general, still need to be improved. There should be numerous efforts made by related parties in education to make the students' reading literacy much better.

Teachers as the agents of change can facilitate students by promoting some activities related to the reading skills in their classrooms. Many strategies can be applied by the teachers in exploring the students' reading literacy skills. One of the alternatives is reading aloud. Reading aloud can offer children access to content that they might not be able to access on their own (Peterson, 2020), especially for young learners.

Most previous studies show that reading aloud can improve students' reading literacy skills (Marchessault & Larwin, 2013; Nurlaelawati & Dzulqodah, 2014; Oueini et al., 2008; Senawati et al., 2021; Sofyan et al., 2021). It is also an excellent strategy for teaching a language to young learners (Senawati et al., 2021). It can increase students' vocabulary and comprehension (Oueini et al., 2008). Moreover, reading aloud is a research-based, proven technique to encourage students to read on their own (Oczkus, 2012).

Nowadays, teachers are challenged to use technology since most teaching and learning process modes are shifted from offline to online learning due to the Covid-19 pandemic. However, teachers may use technology as a practical teaching and learning toolkit to help students learn more effectively in the classroom (Eady & Lockyer, 2013). So that, students were able to study more effectively and easily as a result of the integration of technology into the learning process. Similar to Scott (2015), who stated that students will be able to operate in a modern environment with the necessary information and abilities, as well as use media and informal ways to deepen their learning and enhance basic literacy skills. Furthermore, technology in education, on the other hand, should not only focus on increasing students' technological abilities, but also on using technology as a teaching tool to increase students' capacity to cooperate with others, synthesize multiple sources of data, and set up essential tasks (Dewi, 2019). Therefore, technology should be used in the teaching and learning process to facilitate students' online learning.

Derived from the above explanations, this study is focused on two research objectives. First, it is purposed to describe the teaching and learning process when the students conducted the given reading aloud activities. Second, the study is aimed at investigating the participants' perceptions of the learning process.

2. METHODOLOGY

This study employed a qualitative research strategy to achieve the above-mentioned research aims. Two arguments for the use of qualitative research are mentioned. First, Hamied (2017) pointed out that qualitative research is not meant to generalize to other geographic locations or people, but rather to get a deep and thorough knowledge of a specific social context or issue. The study, therefore, attempts to obtain a deeper knowledge of reading aloud activities in enhancing students' literacy skills in young learners' online learning. Furthermore, the specific setting or phenomena being examined is within the context of a specific classroom, and the use of qualitative study design is regarded as helpful in this context (Creswell, 2014). Second, the qualitative approach helps researchers to detect issues from the perspective of participants, as well as to comprehend the meanings and interpretations that they attribute to behavior, events, or artifacts (Hamied, 2017). The voices and perceptions of the participants collected from the questionnaires were also reflected by the use of verbatim quotations in this study while examining the reading aloud activities in the research site.

In addition, this study has characteristics that are similar to those of a case study. Yin (2018: 15) noted that a case study is "an empirical method that investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident." Hence, a case study is an attempt to comprehend a real-life situation with significant contextual factors that are pertinent to the studied case. (Yin, 2018). Through the use of a case study, this research aims to illustrate, define, and examine how teachers and students perceived teaching and learning when reading aloud activities were undertaken in connection with their own context.

This study was conducted in one of the private elementary schools in Kabupaten Bandung Barat, West Java, Indonesia. It involves 35 students and their parents from Grade 1 to 3. In the research site, the reading aloud activities were conducted once a week. Every week the students were given a link to a YouTube video consisting of a read-aloud story. They were assigned to watch the video and afterward they were given some related questions that should be answered in the form of a voice note. They sent their works to the WhatsApp Group so their friends and teacher could hear their voices. The research was conducted for six weeks; therefore, there are six reading aloud tasks that the students submitted.

The instruments that had been applied in collecting the data included participant observation and questionnaires. The participant observation was conducted in the WhatsApp Group, where the students' parents submitted the given tasks since the teaching and learning were conducted online. The students' works were assessed based on their performance in answering the given questions. Furthermore, the questionnaires were administered to the students' parents who had guided their children in following the learning. Ten questions included two types of questionnaires: closed- ended questions, in which participants were given a list of current answers to choose from, and open-ended questionnaires, in which they may respond by writing their answers in the provided space, were administered to the participants. The aim of administering the questionnaires to the students' parents was to figure out their perceptions and to understand all the responses towards the reading aloud activities given to their children. Several aspects were included in the questionnaires including their general perceptions of the activities, the improvement on the students' literacy skills, the difficulties found during the teaching and learning process, their recommendations for future reading aloud activities. Furthermore, the data were analyzed using several procedures, including collecting data from instruments, reducing and coding the data, analyzing the data, drawing conclusions, and offering recommendations.

3. FINDINGS AND DISCUSSION

The analysis and interpretation of the results obtained from participant observation and questionnaires will be presented in this section. The explanation will be delivered in two parts, as well as the objectives of the research: (1) the reading aloud activities in the young learners' online learning and (2) the students' parents' perceptions of the activities.

a. The Reading Aloud Activities in the Young Learners' Online Learning

   In this study, the students were assigned to watch the reading aloud videos on YouTube that had been uploaded by the teachers. The research was conducted for six weeks and included six storybooks. The following table is the titles of the story of reading aloud videos that the students needed to watch.

Table 1.

The story titles of reading aloud videos.

Week	*Story Titles*
1	*Gurita yang Suka Menggelitik (Written by Ruth Galloway, Published by Erlangga for Kids)*
2	*Seribu Sahabat Selamanya (Written by Clara Ng, Published by)*
3	*Ashabul Kahfi (Written by Ana P. Dewiyana & Indrayani Mallo, Published by Pelangi Mizan)*
4	*Nabi Yunus dan Paus (Written by Risma Dewi, Published by Pelangi Mizan)*
5	*Qarun (Written by Iwan Yuswandi, Published by Pelangi Mizan)*
6	*Baarakallaahu Fiik (Written by Aan Wulandari U., Published by Tiga Ananda)*

All books were read and videotaped and could be accessed by the students from the YouTube links that had been shared by the teachers in their group. Every week, for six weeks, the students needed to watch one video and answer the given questions related to the story. After that, they recorded their answers by using a voice note or a voice memo and sent it to the WhatsApp group for each class. All activities were guided by their parents since they did the activities at home (online learning). Almost all students could submit the tasks on time. Some of them needed to be motivated to submit the voice memo, though.

Based on the observations made in the WhatsApp group and the work submitted by the students, it can be concluded that most of the students performed well in the activities. Moreover, the quality of their work indicated that their reading skills were improving week by week. Thus, it shows a similar result with the previous studies which claimed that reading aloud can improve students' reading literacy skills (Marchessault & Larwin, 2013; Nurlaelawati & Dzulqodah, 2014; Oczkus, 2012; Oueini et al., 2008; Senawati et al., 2021; Sofyan et al., 2021). It is also an excellent strategy for teaching a language to young learners (Senawati et al., 2021). Moreover, it can increase students' vocabulary and comprehension (Oueini et al., 2008).

b. The Students

Concerning the participants' parents' responses to the implementation of reading aloud activities in their children's classrooms, the data from questionnaires were analyzed. The responses will be delivered in some categories: general perceptions on the activities, the improvement on the students' literacy skills, the difficulties found during the teaching and learning process, their recommendations for future reading aloud activities.

In responding to the close-ended questionnaire Item Number 2, 3, and 5 regarding the participants' general perceptions on the reading aloud activities, the participants' responses can be observed in the following table.

Table 2.

The participants' general perceptions on the reading aloud activities.

Item No.	Statement	Like	Dislike
2	Students' parents' perceptions of the activities	35 (100%)	0 (0%)
3	Students were engaged in the learning activities	32 (91.4%)	3 (8.6%)
5	Students' perceptions of the activities	34 (97.1%)	1 (2.9%)

From the table above, it can be concluded that all students' parents claimed that they like to have reading aloud activities for their children. The followings are the excerpts of the open-ended questionnaires of the same number item.

- *Menjadikan anak antusias* (Motivate children to be enthusiastic in learning) (Participant 7)
- *Karena meningkatkan kreatifitas dan daya ingat dalam berfikir* (It can increase students' creativity and memorization) (Participant 8)
- *Karena lebih menarik untuk anak belajar* (It is interesting for students) (Participant 17)
- *Supaya anak bertambah wawasannya* (My children's knowledge is increased) (Participant 19)

From the excerpts above it can be noted that the students' parents responded to the given reading aloud activities positively. Moreover, six of the participants stated that the learning activities helped their children to be more motivated when the teaching and learning had to be done from home. However, from Table 2, in answering question item 3, three participants (8.6%) stated that their children were not enthusiastic about following the learning. Two of them stated that their children were getting bored and one of them claimed that the story was too long. Moreover, from question item 5, one student did not like to have the activities in her/his class. No reason was stated by the participant.

Nevertheless, from the results of the questionnaires, it can be concluded that almost all participants agreed that they like to have reading aloud activities for their children.

Concerning the improvement of the students' literacy skills, question item 6 (Is your children's interest in reading increase after following the reading aloud activities?) was given to the participants. In responding to the question, 32 participants (91,4%) claimed that their children's interest in writing was increased, as they pointed in the questionnaires.

- *Karena setelah adanya pelajaran menyimak cerita, anak senang membaca cerita, membaca buku* (after the reading aloud activities, my child likes to read story, read book) (Participant 8)
- *Sangat meningkat, baca anak saya jadi lancar* (significantly increased, my child's reading is getting better) (Participant 10)
- *Jadi mereka tau dan memahami isi ceitanya* (They become know and understand the gist of the story) (Participant 23)

From the excerpts above, it can be stated that the students' parents agreed that their children's interest in reading was increased.

Regarding difficulties found during the teaching and learning process, from the administered questionnaire, Item 7 (*Did you find any difficulties in guiding your children in performing the reading aloud activities?*), 24 of the participants (68.6%) claimed that they found some difficulties in guiding their children in preforming the reading aloud activities. The difficulties found among others their children were reluctant to do the activities, they preferred to play; were not focused so they need to watch for several times to understand the stories; and did not have much time, since their parents had to go to work. Nevertheless, 11 participants (31.4%) stated that they did not find any difficulties.

In addressing the last part of the questionnaire about the possibility of future reading aloud activities implementation, almost all participants (32 participants or 91,4% of them), responded that they agreed if the reading aloud activities are continuously implemented in their children's class. Additionally, they wish to have a more varying story to be read, so that, their children can be more engaged with reading and their children's knowledge can be enlarged.

To sum up, most of the students performed well in the activities. They and their parents gave positive responses toward the reading aloud activities. It then shows a similar result with some previous studies which agreed that reading aloud can improve students' reading literacy skills (Marchessault & Larwin, 2013; Nurlaelawati & Dzulqodah, 2014; Oczkus, 2012; Oueini et al., 2008; Senawati et al., 2021; Sofyan et al., 2021).

A number of reasons have led to this conclusion. First, the students were exposed to new experiences that stimulated their interest. Reading aloud was new for the participants in the research site, it was one of the reasons why they were so enthusiastic in following the given activities. The students' parents have also recognized the importance of reading aloud for their children. Therefore, they like to have more reading aloud activities from their children, as is reflected from their responses in the questionnaires.

Second, input and exposure the students got from storybooks. Reading aloud is a research-based, proven technique to encourage students to read on their own (Oczkus, 2012); so that, by having the input and exposure to books, the students' reading literacy skills can be increased.

Third, the students' experiences with technology. In completing their works, the students were getting in touch with technology. They use applications (*WhatsApp, YouTube*, and voice note applications) that they accessed from their gadgets. Students were able to study more effectively and easily as a result of the use of technology in online learning (Eady & Lockyer, 2013). Similar to Scott (2015), who stated that students will be able to operate in a modern environment withthe necessary information and abilities, as well as use media and informal ways to deepen their learning and enhance basic literacy skills.

4. CONCLUSION

The purpose of this study is to examine the reading aloud activities conducted in one of Kabupaten Bandung Barat's elementary schools. The results suggest that the children were capable of performing well in the reading aloud activities and that the activities were well appreciated by the parents. As a result, reading aloud activities might be one of the alternate strategies for encouraging young learners in improving their reading literacy skills in their online learning.

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AUGMENTED REALITY FOR LEARNING BIOLOGY IN DISTANCE EDUCATION

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ABSTRACT

Augmented reality (AR) is an added virtual object on real object. An advantage of Augmented Reality (AR) is that it is a combination of virtual and real object, interactivity, and collaboration. AR may enrich learning experience, while it is not to replace real practice or object. DNA replication is one important topic of genetics. DNA is the blueprint of genetic traits of every organism. It's replication, transcription, and translocation will affect metabolism. The authors developed an AR for supporting students to learn DNA replication. The topics of the AR are beginning site of replication and separation of double helix DNA. There are two AR objects produced in this study, the first explain how DNA replication begins and the next one explains how double helix DNA separate prior to the replication. The AR is included in online tutorial of BIOL4219 and BIOL4115 Genetics and General Biology. A survey was conducted to 35 students who take the course in 2021. The questions in the survey are open ended questions about how they learn using the AR and how AR can help them learning. The survey was sent online. There are 10 students replied the survey. Most students feel that the AR help them by showing DNA replication as three- dimensional object. Instead of imagining the DNA replication process as abstract process, this AR allows students to see it like a real object. Another student pointed out that a benefit of using AR is that it allows observation of DNA components which are involved in the replication.

Keywords: *Augmented Reality, Biology, Distance Education.*

1. INTRODUCTION

Universitas Terbuka is a pioneer of open distance education at the tertiary level in Indonesia. UT has a specialty as a university that only provides remote empowerment. One advantage of UT is that it has a very large capacity and can reach various corners of the country.

Augmented Reality (AR) is a virtual display that is added to real objects. The advantages of AR are the combination of reality with virtual displays, interactive nature, and collaboration (Chazopoulos, et al, 2014). AR is useful for expanding the learning experience and not for replacing practical activities with real materials or tools (Torregrosad et al, 2014). DNA replication is one important topic of genetics.

DNA is the blueprint of genetic traits of every organism. It's replication, transcription, and translocation will affect metabolism process (Diki & Dwisatyadini, 2020; Hartl, 2020; Pierce, 2020).

Department of biology at Faculty of Science and Technology at UT provides learning material and learning support system for their students. For example, students attend laboratory practice to get practical experience. In addition, students can utilize different multimedia to learn biology (Diki et. al, 2015; Diki, 2007; Hardjojo et. al, 2007)

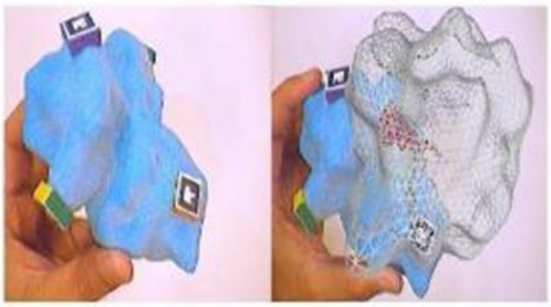
The use of AR at UT can be started by making AR based on mobile phones (HP). AR is used to explain concepts in Basic Material Book. The advantage of AR based on mobile phones is that the equipment is owned by many students and is easy to use. So far, UT has not used AR as a complement to the Basic Material Book. Therefore, there needs to be research to develop AR as a complement to the illustrations in Basic Material Book. This research was conducted to develop AR as a complementary illustration in the Basic Material Book course for the BIOL4115 and BIOL4219 General Biology and Genetics course. Both courses require AR and can be used as examples for AR development in other subjects and in other study programs.

2. METHODOLOGY

The stages of the research are as follows:

a. Identification of BIOL4115 and BIOL4219 Basic material book materials that require AR. The BIOL4115 Basic material book materials that will be identified for their AR needs are: DNA transcription (Module 5 KB1), Translation (Module 5 KB 3), Regulation of gene expression in bacteria (Module 6 KB 1), and Regulation of gene expression in eukaryotes (Module 6 KB 2). The BIOL4115 Basic material book materials that will be identified for their AR needs are: Model, properties, and composition of plasma membrane (Module 2 KB 1), The role of the plasma membrane and communication between cells (Module 2 KB 2).
b. Determining which ICT requires AR.
c. Development needs inventory.
d. Preparation of outline of teaching program. Preparation of story boards (determination of LO, LA, and Assessment).
e. AR program development.
f. Selection of three-dimensional objects, the selected objects are objects that are already available either free or purchased. Thus, the AR development process can run faster than developing the object itself.
g. Preparation of three-dimensional objects into AR objects;

Figure 1.
Example of a physical model of a ribosome without AR and with AR. (Marzouk, 2013)



Courses whose Basic material book requires AR include:

a. BIOL4115 Cell Biology
b. BIOL4219 Genetics
c. The Cell Biology course requires AR because it uses a lot of illustrations about cell structure, cell metabolism processes and cell division. So far, the illustrations in the module are not clear. Students have difficulty understanding the concept without adequate tools.
d. Genetics courses require AR because it describes a lot of replication, transcription, and translation. So far, the illustrations in the module are not clear. There needs to be AR material so that students can understand the role of each component of DNA, RNA and protein in the process of replication, transcription and translation.
e. The material in the genetics module can also be used for AR material in the cell biology module. Thus, AR development for these two courses can be done simultaneously for these two courses. The use of this AR material can be used for both courses.

3. FINDINGS AND DISCUSSION

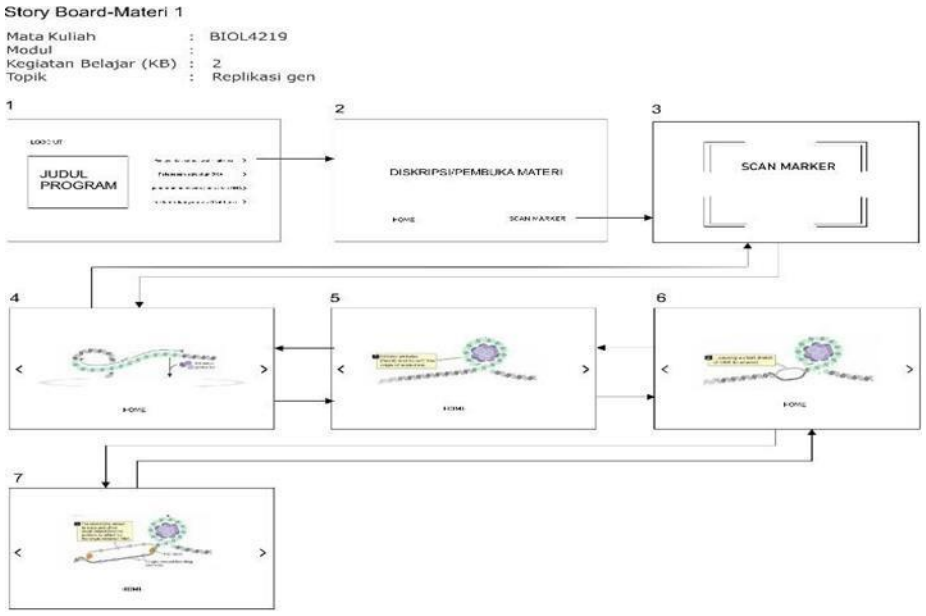
Utilization of augmented reality materials for biology students, Faculty of Science and Technology, Universitas Terbuka :

a. Story Board Material 1

This research is an initial research in the form of two main activities, namely the development of AR materials and the development of Moodle-based AR materials. Research that applies this R&D method needs to be followed up at the expert trial stage and field trials to obtain input for improving product prototypes.Sub-subsection: Guidelines for Abbreviations and Acronyms.

Figure 2.

Sample Story board material 1



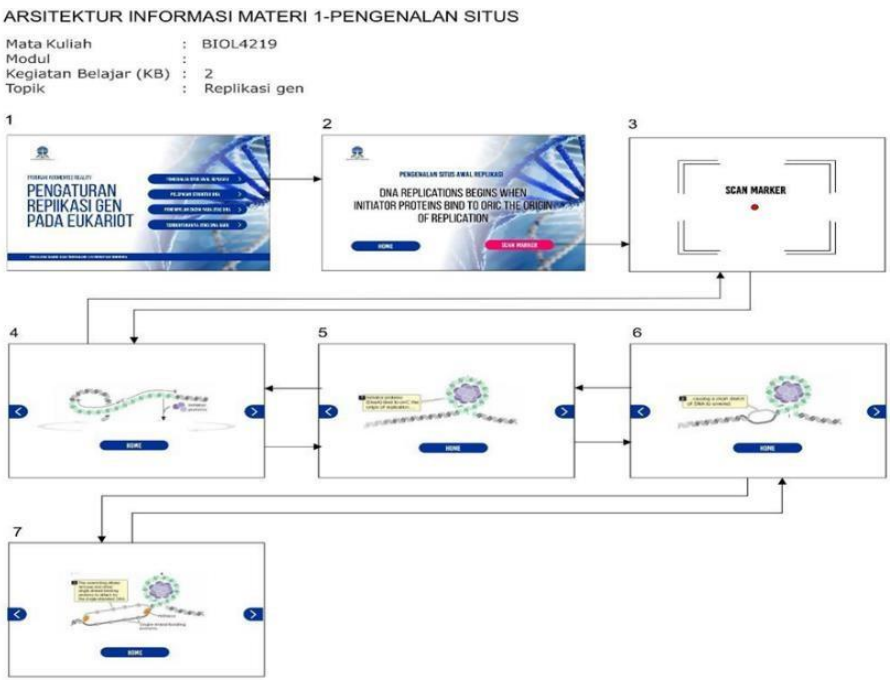
Designing the program interface (cover display and program navigation layout:

Figure 3.
Example of the initial/cover program interface

Figure 4.
Example of a button design for navigation

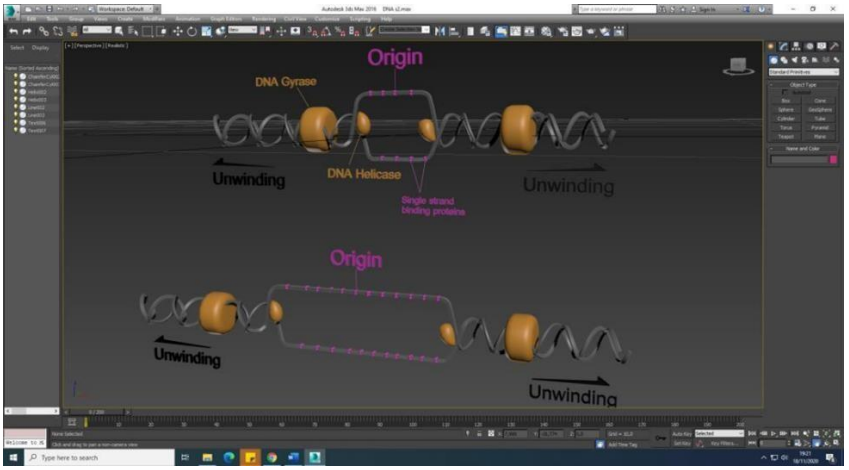
Material one architect information.

Figure 5.
Material one architectinformation



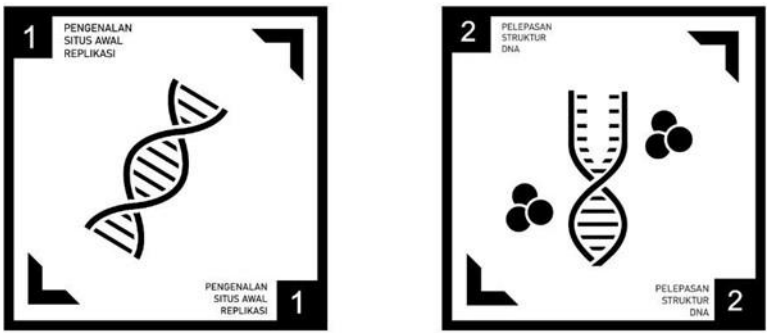
Modeling 3D objects/assets according to the object image in this figure 6.

Figure 6.
Example of modeling material 2



Designing Markers

Figure 7.
Example of material marker



Design 1 and 2 Programming the results of modeling 3d objects in the unity software.

1) AR menu display layout
2) Generating AR+3D+layout menu
3) Compile AR android version
4) Phase 1 trial (Video is on WA)

Stages still in progress

1) Modeling material 3 and 4
2) Programming for material 3 and 4

Result and discussion problems in design

a. Object/asset references are very diverse, so it is difficult to determine the shape or character of the object that best corresponds to the actual object
b. Reference images presented in the manuscript are not very clear. So it is difficult to modify or redesign objects to be more informative.
c. Technical 3D modeling and animation with 3d Max software is still limited.
d. Technical AR programming is still limited to displaying the form and providing a description of the form without displaying the concept of more interactivity.

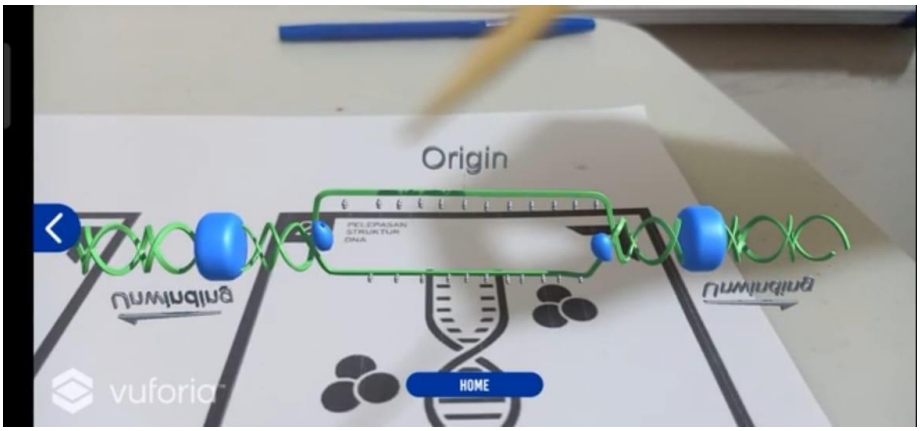
The next step of this study is gaining feedback from students. A survey was conducted to 35 students who take the BIOL4219 course in 2021. All students took BIOL4219 online tutorial that includes videos of the AR.

The questions in the survey are open ended questions about how they learn using the AR and how AR can help them learning. The survey was sent online. There are 10 students who replied the survey.

Most students feel that the AR help them by showing DNA replication as three-dimensional object. Instead of imagining the DNA replication process as abstract process, this AR allows students to see it like a real object. This result is supported by previous study by Diki et. al (2015) that students learn biology by connecting subjects they learn into a real object. In this case, the AR help them as a virtual object of a model of DNA.

Another student pointed out that a benefit of using AR is that it allows observation of DNA components which are involved in the replication. The components of DNA within the AR are described in Figure 6. This result is in line with a study by (Diki, 2015) that students are more likely to succeed when they learn to understand the content. The AR that include components of DNA in a three-dimentional object help students to learn more thoroughly.

Figure 8.
Components of DNA in the AR



4. CONCLUSION

AR helps students learn abstract concept. An abstract object can be presented like a real object in AR. AR showed details of an object.

Further studies are required to measure students' satisfaction as well as feedback to improve the AR.

5. ACKNOWLEDGEMENTS

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INTERPRETATION OF STUDENTS ABILITY TO IDENTIFY HOAXES AND INFORMATION DISORDER DURING THE COVID-19 PANDEMIC

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ABSTRACT

Hoax news becomes a new problem in society, which often biases original information. Meanwhile, social media has now transformed into one of the main media for exchanging information and communicating in Indonesia, especially in the era of the COVID-19 pandemic. This research is applied research that tries to answer the challenges in the pandemic era where we also experience massive distortions of information due to changes in all online communication media. As the subject of this research are students in their teens at the high school level. Teenagers are the subject of research because they are the biggest users of social media and are in the phase of forming an identity so that it is easier for them to accept wrong information without being clarified first. As a sample in this study amounted to 93 vocational students in Surabaya. The results of this study indicate that most of the students lack good literacy so they are still unable to identify hoax news, and they tend to be catalysts in spreading the hoax news.

Keywords: *Hoax, interpretation, information disorder.*

1. INTRODUCTION

Fake news or commonly called hoax is news that is intentionally made to disguise the original news (Stanley et al., 2021). The first hoax news recorded in history began in 1661. The spread of hoax news can also be spread in any form, ranging from words that come out of the mouth, news printed on paper, and others (Bonet-Jover et al., 2021). Along with the development of communication technology, the spread of hoax news occurs very quickly, which was initially only known by a small area, can develop in the wider community (Saputra, 2020). Hoax news can enter any field, for example in the academic, religious, health, technology, and political fields (Sumardi et al., 2019).

Amid the COVID-19 pandemic, the number of Hoax news has increased sharply and poses the danger of various interpretations, related to handling policies, to drugs used to deal with COVID- 19 (RAHAYU, 2020). This makes the danger of fake news even more real because errors in the interpretation of this news have fatal consequences (Rizky & Tarmizi, 2020).

Communication using new media or internet technology can reach directly and quickly to all parties which are currently widely enjoyed (Zakharov et al., 2019). Society has experienced a change in mindset towards an increasingly critical in responding to existing conditions, quickly. Currently, social media has become a new platform for sharing news and information quickly with the help of the internet and changing paradigms in society. Social media has transformed into one of the main means of exchanging information and communication in cyberspace(Awaliyah et al., 2021). However, with all the ease in communicating, a new negative impact emerged, namely hoaxes. Especially during this pandemic, the number of hoaxes related to COVID-19 is increasing very rapidly, both misinformation and disinformation that often occurs in the handling of COVID-19 which can be fatal if underestimated (Rahardi, 2020).

Hoax or term for information from sources that cannot be accounted for. This bias is dangerous because it can mislead human perception by conveying false information as truth (Bonet-Jover et al., 2021). Hoaxes can influence many people and can easily tarnish an image and credibility (Broder & Kunert, 2021). Hoaxes can aim to influence readers with false information so that readers take action according to the contents of the hoax. As a message of false and misleading information, hoaxes can also frighten people who receive them (Martens et al., 2018). A hoax can also be defined as current issues that are used as political weapons, irrelevant truths, or deliberately spread false news (Awaliyah et al., 2021). Thus, it is better if the hoax can be explained, identified and classified to reduce the danger posed (Brianna et al., 2019). Many types of research related to hoaxes have been carried out in the last five years, due to the increase in the number of hoax news in the community. However, until now there have not been many studies related to the classification of hoax news using Indonesian.

This study raises the theme of teenagers as subjects because they are the largest users of social media and have intense digital access (Saddam et al., 2021). In accessing information as to their main information medium, they use news from the internet compared to other formal news (Saputra, 2020). Especially when teenagers are in a developmental and impulsive phase so they are quite vulnerable to hoax news if they are not balanced with a good understanding (Yaddarabullah & Permana, 2021).

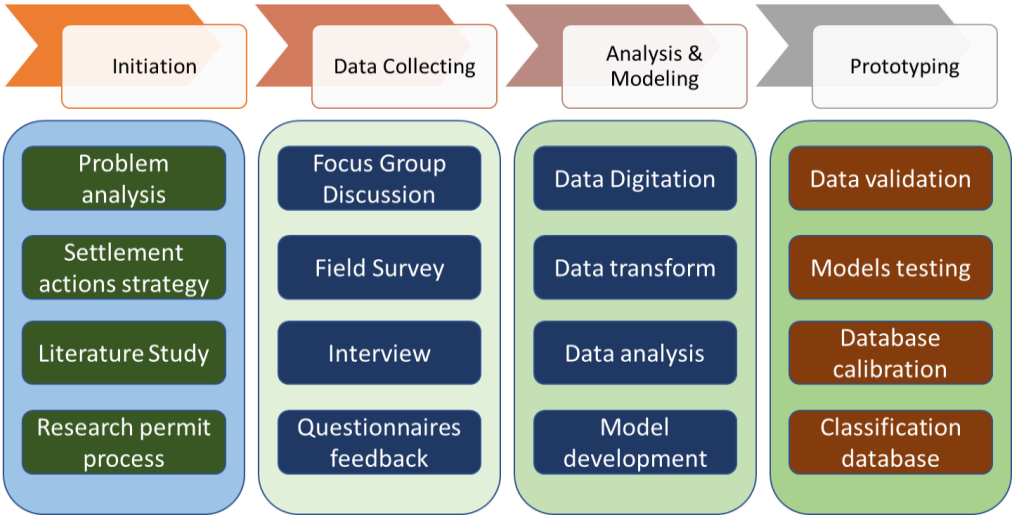
In line with this, studies are needed that help in interpreting students' abilities in understanding hoax news. This is necessary as an initial step of prevention through mentoring students to understand more deeply in analyzing information, especially those obtained on social media. From the background that has been given, several main problems can be raised, namely: 1) it has not been studied more deeply in the characterization of the hoax news identification process by students 2) there is no hoax news classification system 3) the limitations of the content database to support training data 4) counselling and assistance content awareness culture for students is still lacking. Based on these problems, this study aims to try to develop an information model to increase youth awareness of hoax news and collect data in classifying hoax news based on the results of a survey of respondents.

2. METHODOLOGY

The stages of this research can be briefly seen in Figure 1, the research roadmap, as follows:

Figure 1.

Research Roadmap



Previous Studies:

Covid-19 and Hoax on Social Media (Rizky & Tarmizi, 2020), Building critical awareness of corona virus- related news: Cyberpragmatic study of Covid-19 hoaxes on social media (Rahardi, 2020), Analytic- thinking predicts hoax beliefs and helping behaviours in response to the COVID-19 pandemic (Stanley et al., 2021), Analisis Berita Hoax Covid-19 di Media Sosial di Indonesia (RAHAYU, 2020)

In practice, this research tries to divide the problem by taking a theoretical approach and study of the problem of classification of hoax news. At the initiation of the process, analysis and identification of needs are carried out based on the section and the determination of the expected targets. At this stage, a study was also carried out on previous studies that have been carried out including, research from Saputra (Saputra, 2020) which states related to paradigm changes in social media as well as the ease and dangers of disseminating information widely and in line with research from Brothers (Brothers). & Kunert, 2021) who stated the need for data mining to carry out early detection of news that was indicated to be fake/hoax, and Rahardi (Rahardi, 2020) who stated the need for major changes in the reporting mechanism so that the spread of fake news could be reduced.

A. Data Collecting & Sampling

The method used to conduct sampling is a stratified random sampling model. Where the mechanism for collecting data is as listed in Figure 1. The research roadmap is direct observation to the field, interviews, focus group discussions with partner schools and students, who then collect data through questionnaires.

This research partnered with schools at the vocational studies or SMK level as a sample and a means of research trials. This is in line with the research theme by taking samples of adolescent age as described previously in the introduction. As a sample in this study, it involved students in their teens who are generally Generation Y or millennials, who are currently in the age range of 14-18 years. The number of samples in this study was 93 students of SMK YPPI Surabaya. The sample is divided by grade level from grade 10 to grade 12.

The data collection instrument used in this study in addition to using structured interviews also utilizes online questionnaire media. The questionnaire consists of 30 structured questions that represent the classification of hoax news. Further, related to the classification of hoax news, it can be represented in table 1 below.

Table 1.
Hoax Classification Questionnaires

No	*Variables*	*Number of Question*	*Cronbach's Alpha*
1	*Able to illustrate the satire or parody from news*	*3*	*0.79*
2	*Classifying the misleading content*	*5*	*0.91*
3	*Identify the false connection from an article*	*3*	*0.75*
4	*Clarify the false context from an article / video*	*5*	*0.86*
5	*Portray the imposter content from news*	*5*	*0.86*
6	*Interpret the manipulated content from an article / video*	*5*	*0.86*
7	*Depict the fabricated content in form of news/video*	*4*	*0.82*
8	*Personal opinion regarding the hoax on media*	*1*	-

Before the questionnaire is distributed to the sample group, validity and reliability tests will be carried out beforehand to ensure its validity and ability to measure (Hari et al., 2020). As the scale used in this study refers to the Likert scale which has a range from 1 to 5. Where in the following order 1 is absolute reject and 5 is absolute agree. The use of this Likert scale aims to provide a measurement of the value of respondents' perceptions of questions or statements in the questionnaire (Hari et al., 2021).

The validity test is shown by measuring the correlation between variables from the question items on the questionnaire with the total variable value (Lin et al., 2014).

The correlation testing process refers to the product of moment correlation formula, which can be explained as follows:

$$\vartheta_{\alpha\beta} = N\sum \alpha\beta - (\sum \alpha)(\sum \beta) \Big/ \sqrt{(N\sum \alpha^2 - (\sum \alpha)^2 (N\sum \beta^2 - (\sum \beta)^2))}$$

wherein:

$\vartheta_{\alpha\beta}$ = Correlation coefficient between α and β N = is the number of questions tested.

Furthermore, after testing the validity of the required reliability testing which aims to measure the consistency of the scale that has been used. So that the instrument used is still able to provide answers consistently and relatively stable within the specified period. In this study, the reliability value was measured by the *Cronbach Alfa* formula and had a value greater than 0.7.

3. FINDING AND DISCUSSION

The results of this study have very positive implications for partner activities related to the material presented. Unfortunately, there is very little understanding regarding hoaxes for teenagers so information distortion and misinformation often occur in this phase. Documentation of activities carried out at partner schools of this research activity can be seen in Figure 2.

Figure 2.
Research Process Documentation

The results of this study have very positive implications for partner activities related to the material presented. Unfortunately, there is very little understanding regarding hoaxes for teenagers so information distortion and misinformation often occur in this phase.

Documentation of activities carried out at partner schools of this research activity can be seen in Figure 2.

Table 2.
Result of interpreting hoax

No	Variables	μ % Mean	μ Student Class		
			X	XI	XII
1	Able to illustrate the satire or parody from news	56.51 %	3.697	3.8125	4.3571
2	Classifying the misleading content	54.19 %	3.5454	4.1785	3.6562
3	Identify the false connection from an article	51.41 %	3.3636	3.9642	3.4687
4	Clarify the false context from an article / video	52.34 %	3.4242	4.0357	3.5312
5	Portray the imposter content from news	57.90 %	3.9063	3.7879	4.4643
6	Interpret the manipulated content from an article / video	59.75 %	3.909	4.6071	4.0313
7	Depict the fabricated content in form of news / video	49.56 %	3.2423	3.8214	3.3438

Based on table 2, can be described further that the student has totalled 93 people and divided into three classes. There are 33 class X students, 28 class XI students and 32 class XII students. Then from the table, we can be seen the average value of each variable divided by the level per class.

In the first variable, which is measuring students' ability to illustrate from satire or parody news, it can be seen that students in class X can interpret with an average value of 3,697 from a Likert scale between 1 to 7. Then class XI with a value of 3.8125 and class XII with a value of 4.3571. Based on the results of the three, it can be concluded that the average value is 56.51% on a scale of 7. This result represents that students tend to be able to interpret which news is a type of satire or parody of an incident. This result is quite low considering that only more than 50% of students are able to analyze it. This result is also in line with research conducted by Saddam (Saddam et al., 2021), where students are vulnerable to disinformation.

Furthermore, based on the sixth variable, namely the ability of students to describe the manipulated news results in the form of pictures or videos, it gives a positive tendency. It can be seen that students in class X can interpret with an average value of 3,909 from a Likert scale between 1 to 7. Then, class XI with a value of 4,607 and class XII with a value of 4,031. Based on the results of the three, it can be concluded that the average value is 59.75%. This result is the result of the best student analysis of all the variables of this study. Students tend to be able to find out easily if there is a change in the manipulated object, such as a manipulated photo and then given the wrong narration. This ability is the latent intelligence possessed by the current generation of students as stated by Prasetyono (Prasetyono et al., 2018).

While the lowest value can be seen in the seventh variable where students are asked to classify content that is fabricated. The average result from this point shows a value below the baseline, which is 49.56%. More deeply, it can be seen that class X students tend to have difficulties in detecting and classifying this news, as well as class XII students with a score of 3.3438 and finally class XI students with a score of 3.8214. The results of the assessment also show the vulnerability of students in their teens to becoming victims of hoax news. This shows the need for a transformation in our reporting model and an increase in literacy in analysing news (Martens et al., 2018).

4. CONCLUSION

Finally, based on the results of this study, can be concluded that several things can be agreed, as follows,

a. In general, students' understanding of hoax news can be said to be relatively low, because based on the survey results, on average only about 53% can analyze well, and they still have a tendency to spread the hoax news.
b. The ability of students to detect hoaxes is not directly correlated with the level of education or age of the child, for example, the results from class X or Class XII do not show significant differences and tend to be constant on the same error.
c. Students get the main information from news on social media, their tendency to read on other sites such as news sites is also very rare. These trends and changes in literacy behaviour make information channels faster and easier to be biased.
d. Increased understanding of students regarding hoax news is deemed necessary to be improved and become a culture so that it is not easily influenced or misled by hoax news that is not appropriate so that it has a negative impact and a narrow paradigm.

5. ACKNOWLEDGEMENTS

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THE EFFECT OF UNDERSTANDING OF 2013 CURRICULUM IMPLEMENTATION ON THE MOTIVATION AND PERFORMANCE OF SD TEACHERS IN CONTEXTUAL LEARNING IN TEMANGGUNG DISTRICT

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ABSTRACT

Elementary and secondary level education units have implemented a new curriculum to replace the 2006 KTSP Curriculum, becoming the 2013 Curriculum. So with this curriculum change, researchers are trying to research whether understanding the 2013 curriculum affects teacher motivation and performance.

Considering the Covid-19 that has hit the world, including Indonesia, this has led to new rules, namely the implementation of physical distancing so that the spread of the Covid- 19 virus can be minimized, so that research during this pandemic is carried out by practicing physical distancing which then becomes the basis for conducting research using technology, one of which is the other is by using the google form as a questionnaire distribution and data collection. The data were collected from September to November 2020. The sample consisted of 62 respondents in answering the questionnaire from the variable understanding of the 2013 curriculum implementation, the variable motivation and the variable teacher performance. Dissemination and data collection of questionnaire results using the google form and SPSS-26 assistance for statistical tests and used to answer the formulated hypothesis, namely the influence of understanding the implementation of the 2013 curriculum on the motivation and performance of elementary school teachers in contextual learning. The results showed that: 1) there is a positive and significant effect of the 2013 curriculum understanding variable on motivation by 2,99%, 2) there is a positive and significant effect of the 2013 curriculum understanding variable on teacher performance by 6,56%, 3) there is a positive and significant effect simultaneously at 9,5%. The conclusion is that understanding the implementation ofthe 2013 curriculum has a positive and significant on the motivation and performance of elementary school teachers in contextual learning during the covid-19 pandemic.

Keywords: *2013 Curriculum Implementation Understanding, motivation, teacher performance and contextual learning*

1. PRELIMINARY

Motivation starts from the basic word "motive" which means energy, which is able to move and be able to master the personal will to initiate and carry out the arrangement of activitiesin a behavior. Besides that it can be interpreted as a driving force, motivation also has a meaning, namely a collection of efforts in the process of providing a certain condition.

Teachers need a motivation as a stimulus when doing tasks, in order to obtain learning objectives. Motivation functions as a motivator and stimulant for teachers when carrying out their duties as educators, so the teacher tries to carry out his duties to the maximum and always rebuilds his performance.

The 2013 curriculum or listed in SISDIKNAS puts more emphasis on thinking competencies that focus on skills, knowledge, and attitudes. Based on this, it can be seen about the motivation of each teacher in the implementation process of the 2013 curriculum.

Teacher performance is an obligation in the process of improving the quality of learning services which includes the implementation of the curriculum for all components of the subject. One of the parameters that is considered to be able to improve the performance of elementary school teachers is the level of understanding of the curriculum used.

Contextual learning prioritizes the involvement of a student in finding the material. It can be defined as a learning process, which is linked to direct experience. In the contextual learning process, students are expected to be able to find and find subject matter independently.

Students with a high level of learning activity in seeking and finding out for themselves about a material can later have extensive knowledge. This is because they have studied science as awhole which has a relationship between a science and other sciences. The knowledge gained is not only in the form of memorization, but knowledge that is learned and believed by students themselves. With an understanding of the implementation of the 2013 curriculum, the process of inculcating the concept of knowledge is easier to do, because the concept of the 2013 curriculum is thematically based with character deepening.

One of the sub-districts in Temanggung Regency that has successfully started the implementation of the 2013 Curriculum at the elementary school stage is Temanggung District. There is a division of elementary schools in Temanggung District, namely 7 clusters which are divided into 8 to 10 elementary schools. Each cluster in a dabin consists of 5 to 6elementary schools, which have one primary school as the core primary school. Then, elementary schools that are not included as core elementary schools are called impacted primary schools. Management Unit rom the Temanggung District Education Office, indicated that elementary schools are plotting or pilot schools that are expected to be able to implement the 2013 Curriculum. In Temanggung District, there are 20 elementary schools that have been designated as core primary schools. Therefore, it can be said that there are 20 elementary schools as pilot schools that use the 2013 Curriculum.

The implementation process of the 2013 Curriculum is carried out in the 2016/2017 school year. The application was carried out in pioneering elementary schools in Temanggung District, only in grades and 4. This is due to the need for a lot of preparation in the implementation of the 2013

Curriculum. Starting from the students, teachers, learning media, and textbooks that still do not meet the requirements. Based on observations made in the teaching and learning process of public elementary schools in Temanggung District that have implemented the 2013 Curriculum, the majority of elementary school teachers in Temanggung encounter many obstacles in the process of understanding the 2013 Curriculum. If the teacher has not been able to understand how the process of implementing the 2013 Curriculum, there will be a lack of clarity in the learning process that is applied. Obstacles in understanding the theory and practice of implementing the 2013 Curriculum occur due to too fast changes in a curriculum and the necessity for a particular school to implement it. In fact, there has not been a thorough socialization process for teachers. This causes difficulties experienced by teachers to adapt to existing changes. In addition, the abilities of teachers at the Temanggung District Elementary School are very varied. This happens because the age and educational background of each teacher is different.

Older teachers have a passion for learning that tends to be lower in the process of understanding the 2013 Curriculum compared to teachers with younger ages. In the effort to understand the 2013 Curriculum, a difficulty occurred, namely the teacher did not get explanations, materials, time, knowledge, and examples. In order to become a professional teacher, teachers are required to master personality, pedagogic, professional, and social competencies. In addition, the limitations of infrastructure in elementary schools in Temanggung District cause the teacher's ability to be less than optimal in understanding the 2013 Curriculum.

Based on the background of the problem described above, the following problems are formulated:

a. Is there an influence on understanding the implementation of the 2013 curriculum on the motivation of elementary school teachers in contextual learning in the Temanggung district?
b. Is there an effect of understanding the implementation of the 2013 curriculum on the performance of elementary school teachers in contextual learning in the Temanggung district? How big is the influence of understanding the implementation of the 2013 curriculum on the motivation of elementary school teachers in contextual learning in Temanggung District?
c. How big is the influence of understanding the implementation of the 2013 curriculum on the performance of elementary school teachers in contextual learning in Temanggung District?

With reference to the problem, the research objectives are:

a. To describe whether there is an effect of understanding the implementation of the 2013 curriculum on the motivation of elementary school teachers in contextual learning in Temanggung District.
b. To describe whether there is an effect of understanding the implementation of the 2013 curriculum on the performance of elementary school teachers in contextual learning in Temanggung District.
c. To analyze how much influence understanding the implementation of curriculum 2103 has on the motivation of elementary school teachers in contextual learning in Temanggung District.
d. To analyze how much influence understanding the implementation of curriculum 2103 has on the performance of elementary school teachers in contextual learning in Temanggung District.

2. LITERATURE REVIEW AND THEORY

Based on its understanding, the curriculum is a determining place of an education. The success of education itself depends on the curriculum applied. The curriculum is an important factor in the implementation of an applicable educational activity. If there is no curriculum, learning activities cannot be carried out properly. Therefore, each educational unit must pay attention to the applicable curriculum.

Based on Law No. 20 of 2003 concerning the national education system, the definition of curriculum is a collection of arrangements and plans regarding the material, objectives, and content of lessons, as well as the methods used as a basis in organizing learning activities to achieve an educational goal. After studying the curriculum based on Law Number 20 of 2003, it can be seen that there are two types of curriculum dimensions. The first type of curriculum dimension is plan and arrangement. This curriculum dimension contains objectives, lesson materials, and content. The second type of curriculum dimension is the method or stages. In this type of dimension, the method or stage in question is a way of organizing learning activities.

Based on its understanding, the 2013 curriculum is a curriculum based on character and competence systematically, which is the result of improvements from the Education Unit Curriculum (KTSP).

The 2013 curriculum has several differences with the previously implemented curriculum. In the 2013 curriculum, there is an aspect that did not exist in the previous curriculum, namely a scientific approach and authentic assessment in learning activities. After successfully passing the curriculum testing process at several selected schools, the 2013 curriculum was then simultaneously used in all schools in the 2014/2015 academic year. In the process of implementing the curriculum, there are three main programs, namely development, implementation, and evaluation. In the 2013 curriculum, there are several changes to the four main elements of the curriculum, namely process standards, graduate competencies, research, and content. Hidayat (2013) explains that the direction of implementing the 2013 Curriculum is an increase and a balance between knowledge, attitude, and skills.

The educational method used in the 2013 curriculum is no longer in the form of a teaching system aimed at passing the exam (teaching to the test). In the 2013 curriculum, the teaching system used pays more attention to aspects of character abilities, love of national culture, character, and social values.

By implementing the 2013 curriculum, it is hoped that it will produce young people who are creative, productive, and innovative, so that they can survive in international competition. This may happen because the 2013 curriculum based on competence and character has several advantages conceptually. According to Mulyasa (2013), the 2013 curriculum has the advantage of using a scientific approach based on character and using a competency approach that focuses on a field. According to Kurniasih and Sani (2013), in improving the 2013 curriculum, there are several important aspects, including a good evaluation system, student activity, holistic assessment, character education, and competencies as needed.

The teacher is one of the important aspects in the process of implementing the 2013 curriculum (Rohman, 2012). In the process of changing the curriculum, not all teachers are able to master the objectives, purposes, and steps for implementing the 2013 curriculum. Therefore, the development of lesson plans, implementation, and evaluation cannot be carried out optimally which has an impact on the non- fulfillment of objectives.

According to Hasibuan, motivation has the meaning of a psychological process that arises from within a person and is influenced by various factors. There are two types of factors that influence motivation, namely internal factors (intrinsic) and external factors (extrinsic).

According to Rusman (2008: 581), teacher performance is a form of behavior from duru activities in the process of learning activities, which is related to the method used by teachers in planning and implementing learning activities and evaluating the results of learning activities. Meanwhile, performance also means an activity that is carried out and completes a responsibility based on predetermined goals.

Nanik (2010: 72) explains that the concept of learning can support teachers in connecting the material with situations in the real world. In addition, the concept of learning can direct students in connecting the knowledge gained with the application of that knowledge in everyday life. According to Johnson (2008), the contextual learning method is education which has the aim of helping students understand the meaning of the academic material obtained and how to relate it to the application in the real world. Based on this explanation, it can be seen that the contextual learning method is a learning concept. The learning concept in question is a concept where the teacher is able to direct students in connecting the material with its implementation.

3. METHOD

This type of research is research in the form of correlational research. In this study, the population in question is all public elementary school teachers in Temanggung District, totaling 73 people from 7 schools located in Temanggung District, then taken randomly.

The independent variable in this study is motivation (Y1) and the implementation of the 2013 curriculum (Y2) and the dependent variable in this study is the increase in teacher performance, namely variable (X). In this study, the teacher's motivation and performance questionnaire were used as primary data. In the research conducted, the data collection process was carried out by distributing questionnaires to the sample. In the distributed questionnaires, the statements listed are well made, so that they have clear objectivity and objectives for the respondents.

To analyze the data in this study used descriptive analysis and statistical analysis using SPSS V26. Before processing the data with SPSS, it was first tested for normality, linearity, hypothesis testing and partial t-test. This model is used to determine the effect of independent variable to the dependent variable.

Results

1. Simple Regression Test Results Curriculum Understanding with Work Motivation

Model		*Unstandardized Coefficients B*	*Std. Error*	*Standardized Coefficients Beta*	*t*	*Sig.*
1	*(Constant)*	*92.434*	*11.519*		*8.025*	*0.000*
	P Kurikulum	*-0.157*	*0.136*	*-0.147*	*-1.151*	*0.254*

a. Dependent Variable: Motivasi

From the results of the simple regression test above, tcount = 8.025 Sig is 0.000. This means that tcount ttable is 8.025 1.999, then the hypothesis test is H0 is rejected and Ha is accepted. This means that understanding the curriculum has a significant influence on work motivation.

2. Simple Regression Test Results Curriculum Understanding with Performance

Model		*Unstandardized Coefficients B*	*Std. Error*	*Standardized Coefficients Beta*	*t*	*Sig.*
1	*(Constant)*	*99.728*	*12.482*		*7.989*	*0.000*
	P Kurikulum	*-0.223*	*0.148*	*-0.192*	*-1.513*	*0.136*

. Dependent Variable: Kinerja Guru

From the results of the simple regression test above, tcount = 7,989 Sig is 0.000. This means that tcount ttable is 7.989 1.999. So the hypothesis test is H0 is rejected and Ha is accepted. Where it means that understanding the curriculum has a significant influence on teacher performance.

3. Simple Regression Test Results Curriculum Understanding with Motivation and Performance

Multiple Regression Results X, Y1, Y2

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	103.554	11.481		9.019	0.000
	Motivasi	-0.097	0.124	-0.103	-0.781	0.438
	Kinerja	-0.141	0.113	-0.164	-1.244	0.219

a. Dependent Variable: P Kurikulum

Based on the data listed in table 4.16, it is obtained that tcount = 9.019 and the value of Sig is

0.000. This means that tcount ttable is 9.019 1.999, then the hypothesis test is H0 is rejected and Ha is accepted. This means that there is a simultaneous significant influence on curriculum understanding on teacher motivation and performance.

Multiple Regression Results X, Y1, Y2

Model		*Unstandardized Coefficients B*	*Std. Error*	*Standardized Coefficients Beta*	*t*	*Sig.*
1	*(Constant)*	*103.554*	*11.481*		*9.019*	*0.000*
	Motivasi	*-0.097*	*0.124*	*-0.103*	*-0.781*	*0.438*
	Kinerja	*-0.141*	*0.113*	*-0.164*	*-1.244*	*0.219*

Dependent Variable: P Kurikulum

Based on the data listed in table 4.16, it is obtained that tcount = 9.019 and the value of Sig is 0.000. This means that tcount ttable is 9.019 1.999, then the hypothesis test is H0 is rejected

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	75.008	17.564		4.271	.000			
	Y1	-.181	.146	-.156	-1.244	.219	-.192	-.160	-.154
	Y2	.267	.137	.245	1.956	.055	.268	.247	.242

a. Independent Variable: X

Variable X to Y1 = -0.156 x -0.192 = 0.0299 = 2.99%

Variable X to Y2 = 0.245 × 0.268 = 0.0656 = 6.56%

Based on the results of the partial percentage calculation above, it can be seen that understanding the implementation of the 2013 curriculum has a positive effect on motivation of 0.0299 or 2.99%, for understanding the implementation of the 2013 curriculum has a positive effect on teacher performance of 0.0656 or 6, 56%.

5. Partial Determination Test R Square

Predictors: (Constant), Y1,Y2

Thus, the value of the coefficient of determination is 0.095 or 9.5% which shows the meaning that understanding the implementation of the 2013 curriculum has a simultaneous (together) effect of 9.5% on teacher motivation and performance. While the remaining 90.5% is influenced by other factors not observed in this study.

3. CONCLUSION

The results of the study indicate that the understanding of the 2013 Curriculum that has been implemented in Temanggung District has a positive influence on teacher motivation and performance in contextual learning, while the major effects are as follows:

a. Hypothesis testing, using a simple regression test X against Y1 obtained tcount = 8.025 Sig of 0.000. This means that tcount ttable is 8.025 1.999, then the hypothesis test is H0 is rejected and Ha is accepted, meaning that there is a significant influence on understanding the 2013 curriculum on work motivation, the magnitude of the effect is 2.99%, so the first hypothesis which states "Understanding the implementation of the 2013 curriculum (X) has a significant and positive influence on teacher motivation in contextual learning (Y1) at SD Negeri Temanggung District" has been proven and declared accepted.
b. Hypothesis testing, using a simple regression test X against Y2 obtained tcount = 7,989 Sig of 0.000. This means that tcount ttable is 7.989 1.999, then the hypothesis test is H0 is rejected and Ha is accepted, meaning that there is a significant effect of understanding the 2013 curriculum on teacher performance by 6.56% so that the second hypothesis states "Understanding the 2013 Curriculum Implementation (X) have a significant and positive influence on teacher performance in contextual learning (Y2) at SD Negeri Temanggung District" has been proven and declared accepted.
c. Meanwhile, the results of the multiple regression test of X against Y1 and Y2 obtained tcount = 9.019 and the Sig value of 0.000. This means that tcount ttable is 9.019 1.999, then the hypothesis test is H0 is rejected and Ha is accepted, that is, there is a significant effect simultaneously on understanding the 2013 curriculum on teacher motivation and performanceby 9.5% so that the third hypothesis states "Understanding Curriculum Implementation 2013 (X) has a significant and positive effect on motivation (Y1) and teacher performance (Y2) in contextual learning at SD Negeri Temanggung District" has been proven and declared accepted.

4. SUGGESTION

Based on the conclusions of the study as described above, several suggestions are proposed as follows:

a. Advice fpr Teachers

   To teachers in order to increase high teaching motivation and create a good work environment as well. Understanding fosters teaching motivation is not only influenced by external factors, the most important is the factor from oneself (intrinsic motivation), namely efforts to improve performance and profession.

b. Advice for Principals

   The principal should pay more attention to and motivate school members in creating a supportive work environment as well as preparing facilities and infrastructure in schools.

The principal pays attention to efforts to develop a good work environment, thereby influencing the performance of teachers in carrying out their responsibilities and duties as educators.

c. Suggestions for the Temanggung District Education Office

The Education Office of Temanggung Regency should facilitate various educational and training activities, workshops, and seminars on a regular and continuous basis in order to increase motivation and teacher performance by facilitating the provision of facilities and infrastructure in order to create a conducive work environment.

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