

Analysis of Learning Effective Improvement through the Application of Digital Literature in Learning in Kristen Rantepao SMA

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Abstract

The aims of this research are 1) to be able to find strategies to improve teacher pedagogic competence in implementing digital literacy; 2) to improve the aspect of collaboration between students so that they can collaborate in learning with the implementation of digital literacy; 3) to improve aspects of students' attention in learning by implementing digital literacy; 4) to improve the aspect of student interest/curiosity in learning with the implementation of digital literacy; 5) To improve the communication aspect of students in learning by implementing digital literacy; 6) To improve aspects of student creativity in learning by implementing digital literacy. The method used is qualitative with a participatory action research (PAR) approach. The results obtained: 1) the benefits of digital literacy in the aspects of cooperation and teacher pedagogical competence are the sharing of resources through social media (WhatsApp, Telegram, messenger) or e-mail; 2) With digital literacy, teachers can present more concrete digital media in learning; 3) It is easy to obtain information from digital sources so that the information obtained by students is always updated so that students are more communicative and open in learning; 4) The presence of digital teaching materials that are more interesting and interactive makes the desire/curiosity of students increase so that students are more active in learning and become independent learners; 5) The existence of various interactive media, digital learning resources, and innovative findings on the internet that are easily accessible through digital tools make student creativity increase along with the application of digital literacy; 6) The application of digital literacy in learning can run well if the teacher's pedagogic competence is good to guide students to learn digitally according to their abilities and interests.

Keywords

Learning effectiveness; pedagogic competence; digital literacy



I. Introduction

Education is a very meaningful asset for the development of a country; therefore every citizen is obliged to participate in education ranging from early childhood education to higher education. the 1945 Constitution article 31 paragraph (1) every citizen gets an education; (2) Every citizen is obliged to attend basic education and the government is obliged to pay for it. Two paragraphs in Article 31 of the 1945 Constitution mandate that every citizen has the right and is obliged to attend education.

According to the attachment to the Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 103 of 2014, related to the principles of primary and secondary education (point 12), it is stated that to achieve good education quality, it is

necessary to use information and communication technology to improve the efficiency and effectiveness of learning. Learning can be effective and efficient if it fulfills 5 (five) activity principles (Permendikbud No. 14 of 2014 article 2), namely: 1) the implementation is interactive and inspiring; 2) fun, motivating, challenging students to participate actively; 3) contextual and collaborative; 4) provide sufficient space for the initiative, creativity, and independence of students; and 5) according to the talents, interests, abilities, and physical and psychological development of the participants. Of the five principles of learning activities, the teacher's role is very important in managing learning in schools. Teachers are the spearhead of the education system as well as have a function in schools as agents of change in the education system itself, including improving the quality of education.

Education management in the 4.0 era can no longer be separated from technology, so learning must be managed with technological tools such as computers, laptops, and even cellphones. Mandatory education management is transformed from conventional to digital-based education. The teacher is no longer the main source of learning but rather plays a role as a facilitator in teaching their students. Thick printed books are no longer the only source of learning but through mobile phones, students can obtain learning resources from various sources that can be accessed online using technological tools, so teachers are required to be technology literate to be able to facilitate students in learning so that learning effectiveness runs according to its objectives.

The importance of digital literacy in all sectors of human life today and in the future so that countries seek to develop and implement digital literacy transformation. The digital literacy movement has begun to be aggressively driven by the government in Indonesia, both from the Ministry of Communication and Information and the Ministry of Education and Culture, which is marked by the launch of four digital literacy modules, namely: 1) Good at digital media, 2) Ethical in digital media, 3) Safe in digital media, and 4) Digital media culture. (Press Release NO.123/HM/KOMINFO/04/2021). This kind of movement should start from school by integrating learning with digital literacy to prepare the nation's generation for the future. But in reality, there are still many teachers who have not been able to integrate learning with digital literacy and still maintain conventional learning methods.

Expectations mandated in the 1945 Constitution and Law No. 20 of 2003 concerning the national education system are still far from expectations. Indonesian education problems have not been resolved such as the uneven distribution of skilled teachers, inadequate facilities and infrastructure, lack of innovation in finding learning materials, education costs are still considered expensive, quality of education is low, and it is difficult for disabled groups to get inclusive schools (Khotimah et al., 2019). The problems of education in Indonesia also occur in Rantepao Christian High School. Based on initial observations, teachers often complain of low student learning outcomes, low interest in learning, low student motivation, inadequate learning resources, and lack of time. Problems like this are an indication that learning is not running effectively. For this reason, it is necessary to research to answer educational problems in schools with the title, "Analysis of Increasing Learning Effectiveness through Teacher Pedagogic Competence Development and Application of Digital Literacy in Learning at Rantepao Christian High School"

II. Review of Literature

Effectiveness comes from the word effective which can be interpreted as a satisfying impact that arises because there is a process carried out to achieve the goals or objectives of the organization. Another definition in general, effectiveness is an achievement that an organization wants to achieve. According to Hidayat (Ismail, 2021) explains bahwa, "effectiveness is a measure that states the achievement of targets (quantity, quality and time) that can be achieved, the higher the percentage of targets achieved, the higher the effectiveness. So effectiveness is something the level of success obtained by a person or an organization based on the goals to be achieved.

The measure of learning effectiveness can be seen from the interaction between teachers and students in the learning process in an educational atmosphere to achieve learning objectives. John Carroll in Rohmawati (2018) states that the effectiveness of learning depends on 5 factors, namely: 1) attitude; 2) the ability to understand learning; 3) persistence; 4) opportunity; 5) learning quality. The existence of an attitude of acceptance of students will cause students' interest in learning in the classroom. Education is the foundation of a successful career, financial freedom, the ability to think and reason critically and to make informed decisions. Without education we will be limited to perform tasks and we will be ignorant to the things that are happening in and around our surrounding, and according to Martin Luther King, a people without knowledge is like a tree without roots. For education to be of great value, curriculums should be implemented. (Philips, S. 2020)

The effectiveness of learning can also be seen from the learning outcomes of students, of course, more effective learning will produce more satisfying results. The level of achievement of a learning process can be expressed in the form of attitude values, knowledge values, and skill values. These three values are used as a measure of learning outcomes as changes experienced by individuals during the learning process. Asriningtyas, AN, et al (2018) state that: "learning outcomes are the results obtained by a person from the activities carried out by changes in behavior". Meanwhile, Hernawati (2018), states that: " Learning outcomes are changes in skills, skills, behavioral habits, interpretations, insights and appreciation/appreciation, in terms of knowledge/cognitive, attitude/affective and skills/psychomotor". So in learning, learning outcomes are abilities possessed by students after obtaining learning experiences that include aspects of attitude/affective, knowledge/cognitive aspects, and skills/psychomotor aspects. Waisman in Situmorang (2019), states that: " the learning outcomes that can be achieved by a person are the result of the interaction of various aspects that influence him, both internally and externally". In detail it is explained as follows: 1) Internal factors, namely factors originating from oneself in the form of intelligence, motivation, interests, attitudes, study habits, and physical and mental health; 2) External factors, namely factors that come from outside themselves in the form of the influence of family, school, and community.

From the description above, it can be concluded that the indicators of the effectiveness of the learning process can be seen in the value of student attitudes, namely aspects of cooperation between students or students and teachers, aspects of student attention to teaching materials, aspects of communication in Digital Literacy

The word literacy comes from the Latin "literatus", which means people learn. Literacy refers to a person's abilities and skills in reading, writing, speaking, calculating, and solving problems at a certain level of expertise that can be used every day (Munir, 2017). Meanwhile, Paul Gilster in the Ministry of Education and Culture (2017) states that

" Digital literacy is defined as the ability to master and use information in various forms from a very wide variety of sources that can be accessed via computer devices.

The form of applying digital literacy in learning refers to the Connectivism learning theory. According to Sujak (2020), " Connectivism learning philosophy argues that knowledge is created as a result of connectivity between "nodes" (the points or nodes that contain data sources)". It is clear in the theory of connectivism that there are many nodes which he calls "nodes" to create individual knowledge and from each node as a source of knowledge will be connected without being controlled by a particular organization. Downes (Sujak, 2020), states, "in connectivism, there is no real design about transferring knowledge, creating knowledge, or creating knowledge, but rather it is shown that there are activities carried out". With the activities carried out by each individual at each node, knowledge will grow and develop based on each connected/connected node. Siemens (Sujak, 2020) states that "connectivism in learning has principles, namely: 1) knowledge and learning are in various kinds of views/opinions; 2) learning in the form of a system of connecting between data sources and specific node points; 3) the ability to know more is more important than the existing knowledge; 4) continuously build connectivity so that the learning process continues; 5) the capacity to see the connectivity between ideas and concepts at each node will be a core competency; 6) current knowledge is the will of each party who is in a connected situation; 7) the decision is the result of the learning process".

The context of learning in schools is always related to two main parties, namely teachers and students. Teachers and students in the learning system in the 4.0 era are interconnected, meaning that students are no longer in a passive position as recipients of information but have become active learners. Teachers and students play a role in providing information to each other. According to Riyana (2020), for teacher-student interaction to occur, ICT-based tools are needed. The functions of ICT tools in learning are 1) teacher aids; 2) teacher-student interaction aids; 3) student aids. According to Bejaković & Mrnjavac (2020) in a study entitled, " *The importance of digital literacy on the labor market* ", states that, "digital literacy is an important factor for the socio-economic development of society and competence for the workforce". This can be interpreted that someone can't participate properly in all-digital economic activities without adequate digital literacy. For this reason, students need to be equipped with digital literacy as a provision to enter the world of work in the future. The results of another study conducted by Anh & Nguyen (2021), found that most students in Vietnam can access digital technology at home and in other institutions including at school. Not only that, students can develop knowledge by using digital literacy, and their technological expertise is increasing. From Anh & Nguyen's research, it can be said that easily accessing the internet in various places will provide benefits, including 1) being able to study independently both at home and school, 2) being able to choose applications that match the material being studied, 3) collaboration between teachers and students. students or parents-students are younger, 4) learning resources are very diverse, and 5) children's digital literacy is getting more trained.

III. Research Method

The research method used is a descriptive qualitative research method, with a *Participatory Action Research approach (PAR)*. The participatory study was developed by Stephen Kemis and Robin MC. Taggart with various variants, namely *Participatory Action Research (PAR)*, *Critical Action Research (CAR)*, *Classroom Action Research (CAR)*, *Action Learning (AL)*, and *Action Science(US)* (Kemmis et al., 2014). At the beginning of

PAR which was based on the transformation from the old way to a more modern way, this research was also designed as a joint movement in transforming from conventional learning to digital literacy learning, and also accompanied by an increase in the pedagogic competence of teachers. Two actions are increasing the pedagogic competence of teachers at the beginning of the semester and the application of digital literacy in learning to increase the effectiveness of learning at Rantepao Christian High School.

Data analysis techniques include data analysis on the learning process of each phase, and data on supervision/observation of principals using a Likert scale of 1 to 4, which are then described into qualitative values; less, enough, good, very good. The observation data for each phase from the collaborative teacher is interpreted in the form of a bar graph to describe the 5 aspects observed by each collaborative teacher. For reflection data that is used to correct the action, data that is interpreted in a pie chart is used to describe student achievement in each of the observed aspects. All required data are described in the form of learning effectiveness tables, pedagogic competency improvement tables, and digital literacy tables. The next step is to interpret the three tables into qualitative values with the status of very good, good, sufficient, and lacking in one table to simplify the overall data analysis.

IV. Result and Discussion

4.1 Discussion on Cooperation Aspects

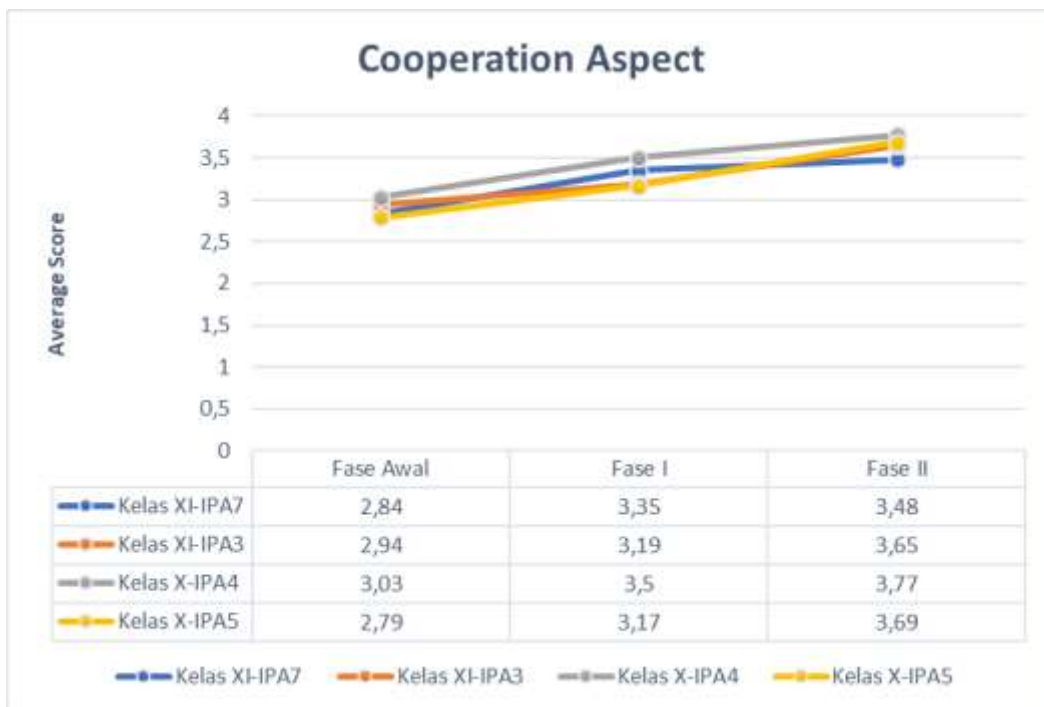


Figure 1. Changes In the Aspect of Cooperation

If the picture above is considered, on average from the initial phase, phase I, and phase II, if a straight line is drawn, an almost linear line will be formed in each class that is observed, especially in classes X-IPA4 and X-IPA5. If you look at the early phase of this class, the chemistry and biology teachers have not fully utilized digital literacy (see table 3). Then in phase, I, chemistry and biology teachers used digital literacy fully so that the

value of the student collaboration aspect increases from phase I to phase II with some improvement actions in phase 2. In class XI-IPA 7, XI-IPA3 has an increase that is not too linear because physics and mathematics teachers have used digital literacy fully from the beginning to phase II, an increase because there are several corrective actions taken in each phase.

The importance of the aspect of cooperation is measured in the learning process because in learning in the 21st century, one of the skills expected is collaboration skills. Because the collaboration/cooperation aspect will train students to work in teams, solve more difficult problems, share creative ideas, and do other things that require cooperation. In the learning process for the four collaborative teachers, it was found that students' collaboration abilities were more enhanced by using digital literacy in completing school assignments. Now, teachers and students can make good use of digital learning platforms, which are marked by the use of Google Meet and Jamboard when online learning is needed. When the COVID-19 pandemic hit Indonesia, teachers at Rantepao Christian High School had used Google Classroom as a learning management system (LMS) and Google Meet which was integrated with a learning account facilitated by the Ministry of Education and Culture. Teachers and students are given an account with the extension learn. id. In google meet, students can be divided into discussion groups that not only prepare video and audio but students can collaborate and interact interactively using the jam board. With the digital literacy abilities of teachers and students increasing along with the increase in teacher competence and students' digital competence getting better, the collaboration skills of students also increase.

Using digital tools such as mobile phones, tablets, laptops, or PCs in learning will give birth to better collaboration/collaboration skills. This can be seen when the 4 collaborative teachers use digital literacy continuously in learning aspects of the value of students' attitudes in terms of collaboration, experiencing an upward trend as shown in Figure 4.5. In the four classes studied by four teachers who collaborated to implement digital literacy in the learning process through three stages, namely the initial phase, phase I, and phase II, the four teachers got the value of student attitudes in the collaborative aspect increased from the initial phase to phase II, increased. This can be seen when students complete group assignments on time and are active in discussing through a jam board that can be observed by the teacher in real-time.

In terms of asynchronous discussions, the teacher as a student guide in learning both at school and outside of school is very likely to be able to work together no longer confined by space and time because it is so easy to send information via digital media such as WhatsApp, telegram, e-mail. . So that interaction between students or students with teachers allows *sharing of resources* through social media (WhatsApp, Telegram, messenger) or e-mail.

From the description above, it can be said that the application of digital literacy in synchronous and asynchronous learning is very effective in improving students' collaboration skills so that the effectiveness of learning is getting better.

Discussion Aspects of Attention



Figure 2. Graph of changes in student attention aspects

In the aspect of attention, the results obtained are similar to the aspect of cooperation, in that the two classes in class 10 experienced an almost linear increase from the initial phase to phase II due to the full application of digital literacy with several corrective actions in each phase. While two 11th graders experienced a less linear increase because two teachers had implemented full digital literacy since the beginning of the action phase, the increase occurred because there were several corrective actions in each phase.

The aspect of attention is one aspect that needs to be observed in learning because the aspect of student attention is one measure of the effectiveness of ongoing learning. Not infrequently we hear that students are less focused on learning because their attention is not focused on the teaching material being studied, young students are also bored and bored. With the presence of various digital learning formats that are increasingly interactive, such as learning videos that are easily obtained from YouTube, digital images, and digital simulations through learning sites, and digital learning platforms. From the very diverse learning options, teachers are required to have pedagogical competence in choosing and utilizing digital literacy carefully according to the character of the material being taught and the characteristics of students. In the research, MIPA teachers (Mathematics, Physics, Chemistry, Biology) photographed students' attention by applying digital literacy according to the learning syntax in phase I and phase II. In Figure 4.6 it can be seen that by applying digital literacy in learning aspects student attention tends to increase from the initial phase, phase I, to phase II. This can be seen when the teacher chooses the right digital media to explain abstract concepts into more concrete concepts.

Attracting students' attention is very important because abstract learning will make learning ineffective because the messages conveyed tend to be verbal, namely the messages conveyed by the teacher are not the same as student perceptions. In explaining a concept, you need a prop or property that can represent an object being studied. To present

a real object in the classroom is not an easy matter, so we need a prop that can resemble the object being studied. Through digital media, teachers can explain more concrete or simpler concepts.

With the explanation above, by applying digital literacy teachers can present more concrete digital media in learning so that students' attention is more focused and focused on the material being studied, which has an impact on increasing learning effectiveness.

4.2 Discussion of Communicative Aspects

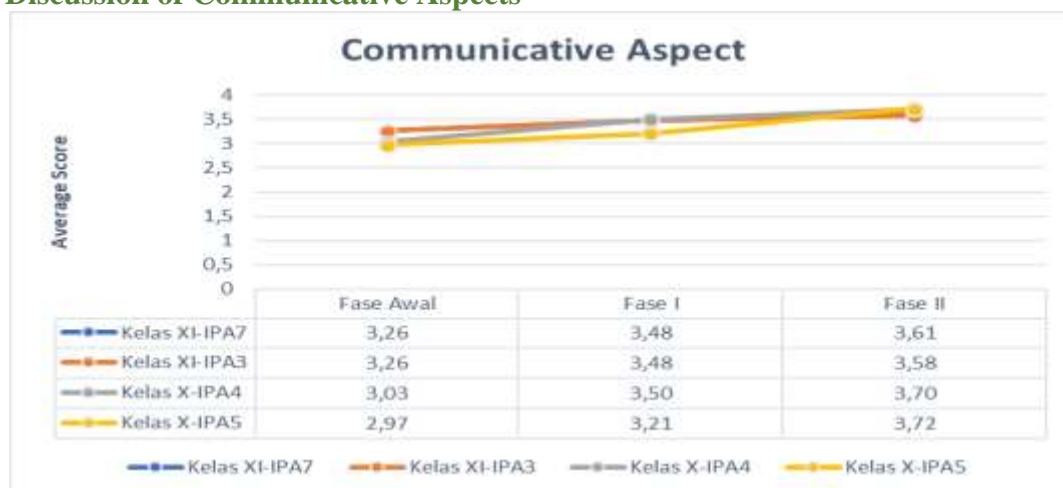


Figure 3. Graph of changes in the Communicative aspect of students

In the communication aspect, the 4 classes observed were actually in good grades on average, because students had fully used ICT tools well. So in this aspect the students as a whole are in good grades, the teacher just directs it and students can do it because communication tools are in the hands of students every day.

The communication aspect needs to be measured because the communication aspect is an important skill in 21st-century learning (communication skill). Because learning is an activity that involves a person acquiring knowledge, skills, and positive values by utilizing various sources for learning. In learning, there are two parties directly involved, namely the teacher as a facilitator and students as learners. Teachers can function as facilitators if they have competencies that can facilitate student learning well, including interaction, this shows that the learning process is a communication process.

The learning process is the process of conveying information from the teacher to students or from other sources to students. So the aspect that needs to be analyzed in this research is the communication aspect related to the application of digital literacy (according to the learning syntax in phase I and phase II). The graph in Figure 4.7 shows that the communication aspect of students has increased from each phase of action due to using digital literacy. In the study, it was observed how well students interacted in the WhatsApp group, or discussions in the classroom were getting easier to do. It is easier for teachers to convey information through social media such as WhatsApp, Telegram, and Messenger than using paper/print media. With the ability of teachers and students in the ICT field to improve, the use of digital media in learning makes it easier to transmit information from teacher to student, student to student, or student to teacher. In a modern learning system, students are not only recipients of messages but also students who convey messages, with the presence of digital media, two-way *traffic communication can occur*, even multi-way *traffic communication*.

Information will travel very quickly from various directions so sources of information are very easy to find. The ease of obtaining information from digital sources makes the information obtained by students always *updated* so that students are more communicative and open in learning. Good communication and many choices of learning resources allow students to learn independently, learn according to their interests and abilities so that learning effectiveness can increase.

Curiosity Aspect Discussion

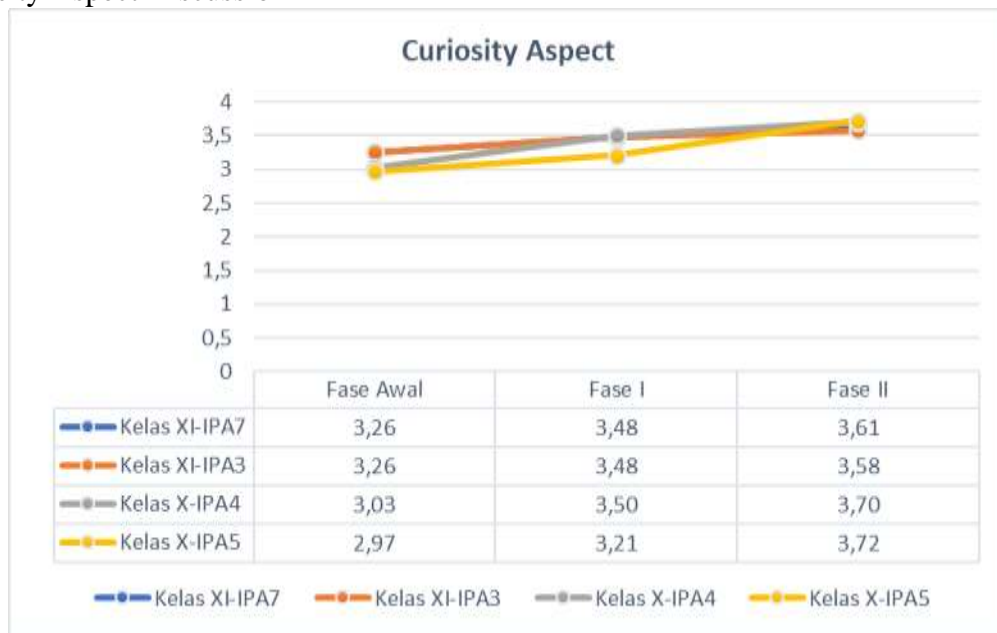


Figure 4. Graph of changes in students' curiosity aspects

If you look at Figure 4, as well as aspects of communication and aspects of curiosity, almost all students are in good grades, because students who enter Christian High School are students who are on average enthusiastic about learning well. In class X-IPA5 on average in the initial phase, it is still below the good average value, but in phase 1 and phase II, after the teacher uses digital literacy, it significantly increases even being at the highest value at the end of the observed phase compared to the class other. This proves that digital literacy can increase student enthusiasm for learning.

The aspect of curiosity will make students more critical of the object being studied so that the expected result is that students can think critically (critical thinking skills). This aspect is also one of the aspects that determine the effectiveness of ongoing learning. Students who have good curiosity will make students active learners and critical learners. So that the aspect that is of concern to the teacher is to make students active in learning, the teacher will try to present methods and media that can attract students' interest or passion for learning. In Figure 4.8, it can be seen that collaborative teacher observations experienced an upward trend from the initial phase to phase II so that the application of digital literacy in learning can make students passionate about learning. In this study, the four collaborative teachers observed student activity in learning by utilizing digital literacy. One of the easiest things to observe is that students are more active in looking for teaching materials using mobile phones compared to reading printed books because the materials on the internet are very diverse, interactive, and easily accessible. It is easy for students to find learning materials through the google search engine, android, and web-based learning

platforms, learning videos available on YouTube, and there are also many digital books facilitated by the government. So that students will no longer have trouble finding learning resources.

With the presence of diverse, easily accessible, and interactive learning resources through technological tools such as mobile phones, tablets, and computers, making students more active in looking for materials that are easy to understand and can foster independent learning, the teacher only guides and reviews mastery of the material. by students. The presence of digital teaching materials that are more interesting and interactive makes students' desire/curiosity increase so that students are more active in learning and independent learners so that learning will be more effective and efficient.

4.3 Discussion of the Aspect of Creativity

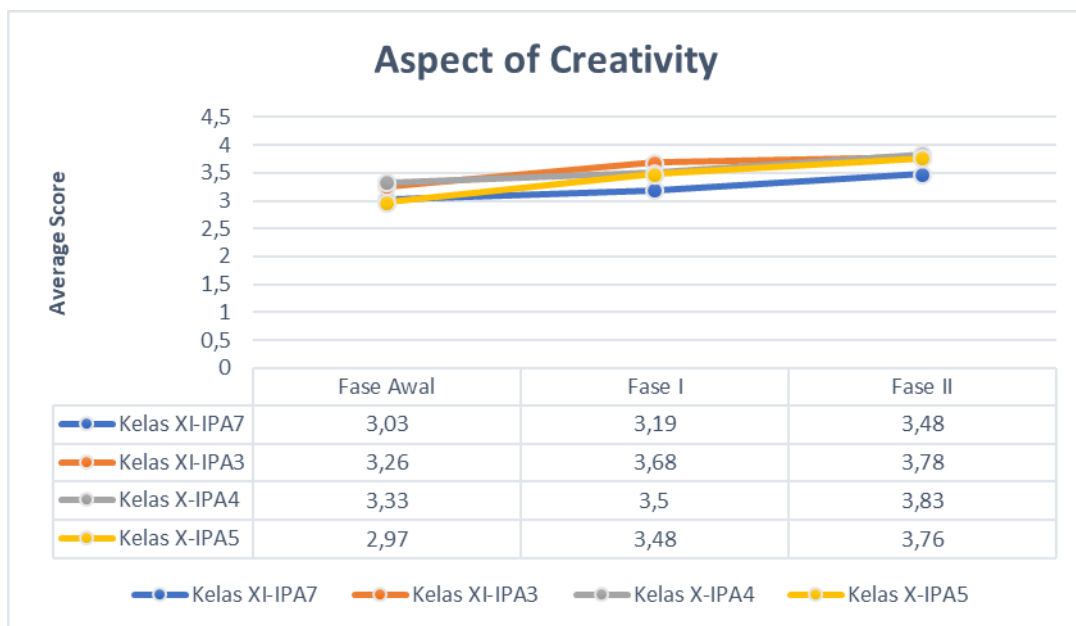


Figure 5. Graph of changes in student creativity aspects

Aspects of students' creativity in the 4 classes studied were at a good average value. Even from the initial phase to the final phase, there is an almost linear improvement with the consistent use of digital literacy. This indicates that digital literacy is very important to put forward in learning today. The aspect of creativity is a very important aspect to measure because this aspect is one of the competencies expected in 21st-century learning, namely creativity competence.

Creativity is very important for teachers and students because it is from the creativity that learning innovations will be born which will be useful for students and teachers. Teaching today's children who are usually called generation z or *millennial generation* who are accustomed to very high internet usage and switch media from print to digital media who are accustomed to social media that presents information without filtering, do not know which information is true and all hoaxes using simple language that is easily digested by generation z children, the generation that is always labeled as the generation whose reading literacy level is very low because they have switched to internet media, the generation that likes to watch videos online or listen to music online and also read books online. With many creative videos available on YouTube, online training prove that digital learning is now more effective than conventional learning.

One of the aspects observed in this research is the aspect of creativity. Student creativity has greatly increased along with the implementation of digital literacy in Christian high schools (Figure 4.9). This can be seen when given project assignments, students no longer have trouble finding the required reference materials, timely collection of assignments, utilizing varied learning resources, making their meeting rooms for discussions using Google Meet, or creating WhatsApp groups for discussion. discuss with friends with the teacher. Even students have been creative by making learning posters and creating learning content using videos uploaded by themselves to YouTube social media.

The existence of various interactive media, digital learning resources, and innovative findings on the internet that is easily accessible through digital tools make student creativity increase along with the application of digital literacy. The benefit obtained from the consistent application of digital literacy is that the creativity of teachers and students will increase along with the development of increasingly sophisticated technology, and everything will be easy to do because to get reference sources it is easy to find.

V. Conclusion

With the implementation of digital learning at Rantepao Christian High School, several conclusions can be drawn based on the analysis data as follows:

1. The benefit of digital literacy in the aspect of cooperation and teacher pedagogic competence is the sharing of resources through social media (WhatsApp, Telegram, messenger) or e-mail.
2. With digital literacy, teachers can present more concrete digital media in learning so that students' attention is more focused and focused on the material being studied, which has an impact on increasing learning effectiveness.
3. Easy to obtain information from digital sources makes the information obtained by students always updated so that students are more communicative and open in learning. Good communication and many choices in digital learning resources allow students to learn independently and learn according to their interests and abilities so that the effectiveness of learning will increase.
4. The presence of digital teaching materials that are increasingly interesting and interactive makes students' desire/curiosity increase so that students are more active in learning and become independent learners.
5. The existence of various interactive media, digital learning resources, and innovative findings on the internet that is easily accessible through digital tools make student creativity increase along with the application of digital literacy.
6. The application of digital literacy in learning can work well if the teacher's pedagogic competence is good to guide students to learn digitally according to their abilities and interests.

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