Augmented Reality Technology to Improve Student Learning Outcomes at SMK Negeri 1 Bantaeng

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ABSTRACT

Study This aim to: a) Knowing results Study student with use technology Augmented Reality on material computer hardware at SMK Negeri 1 Bantaeng, b) Knowing teacher and student responses to application technology Augmented Reality for Increase results Study students on the material computer hardware at SMK Negeri 1 Bantaeng. Type research used _ is study action class with 4 stages namely: planning, action, observation and reflection. subject study This is student class X TKJ 1 Bantaeng State Vocational School 1, totaling 27 students Research results show that application technology Augmented Reality can increase results Study material Computer Hardware. This showed with exists increase in the average cycle I from 67 to 78 in cycle II. Percentage enhancement completed students _ by 34 % from 44% to 78%. Based on results interviews that have done with teachers and students can concluded that technology Augmented Reality is very good and more effectively used in learning Because technology This characteristic interactive and fun making student more active engaged and enthusiastic as well as easier understand material computer hardware. Besides that, use technology this is also relatively easy, simply with install applications on smartphones then, do a marker scan, students Already can see object hardware computer.

Keywords: Improvement, Augmented Reality, Learning Outcomes, Students of SMK Negeri 1 Bantaeng.

1. INTRODUCTION

Role technology have Lots utility in various field and in aspect life. Among them in the world of education, technology that can make it easy student obtain material learning is Smartphones. In Indonesia, smartphones are marketed at a very low nominal cost, p the cause user Smartphones in Indonesia are increasing increase. According to research, Indonesia has percentage user smartphones highest to four in the world [1].

System most popular operations moment This For smartphones is android. Compared to with system operation another, smartphones android based have amount remote user higher [1]. In 2015, around 58.9% users' smartphones Android based around the world. This caused the more many devices available software for smartphones based on android [2].

Technology Augmented Reality in the world of Education yet applied to be a supporting medium for interactive education on a variety of level education start from elementary, middle, high school, as well College. Technology This Actually has brought up inspiration which gave birth to educational media about all type field science [3]. Learning media is all something used in the activity purposeful learning for get feedback from students, feelings, interests' attention as well as perspective, so the process of communication between the teacher and student Can walk with smoothly [4].

Based on results interview directly with an eye teacher lesson Computers and Basic Networks Mrs. Rohadijah, S.Pd. on January 18 2022 which took place at the TKJ Laboratory of SMK Negeri 1 Bantaeng. Researcher get information that students at SMK Negeri 1 Bantaeng specifically for material Computer hardware Still Not yet reach completeness in learn as for the criteria minimum completeness (KKM) for eye lesson Komjardas ie 75. Because, demands circumstances student given repair value. In the learning process, learning media are applied that is use book print, material served in form power point as well as use tool display for help the learning process. Moment this, students required for understand, recognize and observe computer hardware. However, no A little able students absorb all material delivered learning. If student want to learn return material at home, students no have device hardware associated computer _ Because all device only available in the laboratory school. Besides that, use 2D drawing or utilization still images presented in the book lesson form student tend passive as well as not enough interactive, observation very limited students caused by media images not enough seen concrete and lacking interesting so that arise feeling bored students and not Can give good feedback.

it originates of learning media that is applied and made student Not yet seen enthusiastic in implementation learning. If student No involved in implementation learning so will impact on results Study student. So, the role of learning media is very necessary at the time implementation learning. Based on matter that, teacher must build atmosphere that learning effective and dynamic. With interactive learning media, you can increase attitude enthusiastic student in implementation learning. The use of learning media is also increasing understanding student about material Computer hardware with thereby results learn to increase.

One method very effective teaching is with use of learning media technology Augmented Reality. known technology _ with Augmented Reality can blend virtual object two or three dimensions Then project object the in a manner real time [5]. With use of learning media said, delivery material about hardware computer Can helped. Technology Augmented Reality used with objective for increase results Study student, added interest Study students and their current understanding follow learning material computer hardware Good in a manner theory nor practice [6].

Based on description problem such, then writer lift title research "Applicability Technology Augmented Reality For Improving Learning Outcomes Students at SMK Negeri 1 Bantaeng " Study This addressed For help teacher become more practical in introduce component computer hardware, and also simplify student understand as well as motivating student in the learning process especially in material the with more media presentation interesting through technology Augmented Reality so Can increase results Study student.

2. RESEARCH METHOD

2.1 Procedure Study

Procedure Study This refers to research action class or classroom action search. Classroom Action Research (PTK) namely done with four stages namely: (1) Stage planning (planning), (2) Action Stage (action), (3) Stage observation (observing), (4) Stage reflection. Connection between fourth stages the can see in Figure 1.

2.2 Time and Place Study

Place implementation study This carried out at SMK Negeri 1 Bantaeng, Jl. Eagle No. 7, Kelurahan Pallantikang, District Bantaeng Regency Bantaeng, on the moon July-December 2022.
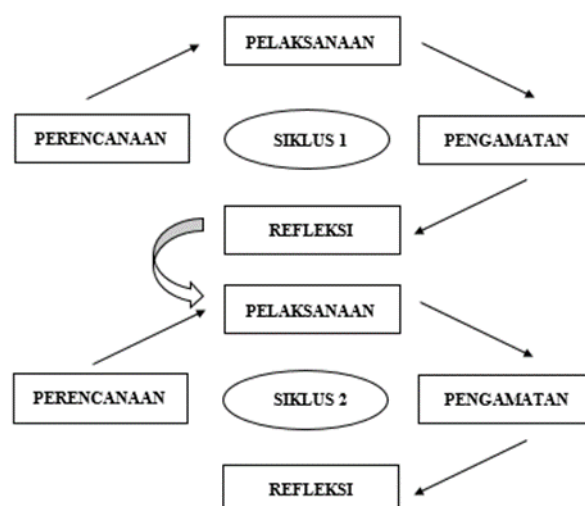

Figure 1. Cycle Model Classroom Action Research

2.3 Subject Study

Subject study This that is student class X TKJ-1 SMK Negeri 1 Bantaeng as many as 27 people, consisting of 9 students' boys and 18 student's girls.

2.4 Procedure Study

2.4.1 Implementation Cycle 1

2.4.1.1 Stage Planning

Stage planning is stage drafting planning to be become instruction in implementation research. Plan they are:

1. Do initial observation for now problems that occur on site through interview with an eye teacher lesson Basic Computers and Networks.
2. Do communication with the teacher concerned related Syllabus learning.
3. Making Plans Implementation Learning (RPP) and tools learning other.
4. Composing instruments as data collector, in the form of sheet observation activity students and teachers who will used in research, tools evaluation form question pre-test and post-test.
5. Prepare equipment as well as room for implementation research.

2.4.1.2 Action Stage

Steps stage action in Cycle I namely as following:

1. Train teachers in use technology Augmented Reality
2. Student enter to room class that has prepared.
3. The teacher starts class with give greetings, continued pray and ask condition student.
4. Teacher informs objective learning to student.
5. Teacher checks readiness Study student.

6. Teacher delivers to student material computer hardware with using technological media Augmented Reality in clear and specific with arrange intonation, tone, volume, and speed talk.
7. The teacher conducts a question and answer to students and give feedback to answer.
8. The teacher reflects and concludes material already _ discussed.
9. Give flash material furthermore for studied at home.

2.4.1.3 *Stage Observation*

Activity stage observations in Cycle I, can look at the steps following:

1. Observe effectiveness activity Study teach.
2. Observe activity students at the time implementation learning.

2.4.1.4 *Stage Reflection*

Stage This done Reflection For review What just happened before and after action based on results test, and results observation on students. Test results student considered succeed If completeness learns 75% of amount students in class the obtain KKM value of 75. Observation data that is produced furthermore analysed and reflected on together for now is happen change during gift action through application technology Augmented Reality as an introduction medium material hardware computer. The results of data analysis carried out in stages This used as reference repair for carry out cycle II.

2.4.2 *Implementation Cycle II*

Research in this second cycle is part improvement of learning strategies cycle I, planning action in cycle II is based on results reflection on cycle I. If the increase has happened in accordance with indicator success, cycle II was carried out as stabilization from cycle I. Conversely, if enhancement No happen in accordance with indicator success, then implementation stages Work cycle II is the same like cycle I.

2.4.3 *Implementation Cycle 3*

Implementation Cycle III is also the same like cycle I and cycle II. However, if in section cycle III yet meet the target value that has been set so need held the next cycle.

2.5 *Data Analysis Techniques*

The analytical technique used ie technique analysis statistics descriptive show in table 1 and table 2.

Objective from analysis the is for describe activity student during implementation learning. As for the description that is done namely analysis quantitative. Analysis quantitative used For process results test student every the cycle. Analysis quantitative This through a number of stages, namely:

2.5.1 *Comparing Means*

Means is average. Means technique-based explanation on the average value of whole value obtained student. Mean Value counted with formula as following:

$$Me = \frac{\Sigma X}{N} \qquad (1)$$

Note:
Me = Mean (average)
ΣX = Amount mark whole student
N = Amount student

2.5.2 *Percentage Completeness Study Classical*

Quantitative data obtained from results test processed with use description percentage. For results test, percentage This used for now percentage completeness Study student in a manner classic. Completeness Study classic counted with use formula:

Completeness Study Classical=
$$\frac{\Sigma \text{ Score} \geq 75}{\Sigma \text{ Subject}} X\ 100 \qquad (2)$$

3. RESULT AND DISCUSSION

3.1 *Discussion Result*

Study This aim for now enhancement results Study student with use technology Augmented Reality on material Computer hardware at SMK Negeri 1 Bantaeng Study This done with 2 cycles. In Cycle I carried out as much three meetings _ also with Cycle II. Every Cycle consists from four stages, that is stage planning stage action, stage observation, as well stage reflection. However, compiling plan action cycle II refers to the results reflection implementation learning Cycle I, so produce repair action from Cycle I.

3.1.1 *Implementation Cycle 1*

3.1.1.1 *Stage Planning*

1. Researcher do communication with the teacher concerned related Syllabus learning, lesson plans, along with tool evaluation students in the form question pre - test and post - test.
2. Researcher do communication with an eye teacher another lesson for Act as an observer and provide evaluation through sheet observation eye teacher activities lesson komjardas, meanwhile researcher do observation to activity student through sheet observation during the learning process going on.

3.1.1.2 Action Stage

Stage implementation This first cycle done as much three meetings. At stage this, execution learning held together with stage purposeful observation for record learning data during implementation learning.

Implementation meeting First i.e. day Thursday October 6 which took place for two hours, Learning started with Greetings, the teacher did presence, deliver objective learning, as well check readiness student then the teacher introduces researcher to student class X TKJ 1 along with intent and purpose.

After that, the teacher allows researcher for start share sheet pre-test as step for dig knowledge beginning students on the material computer hardware. On the side student fill in sheet pre- test given the researcher also started teach to the way teacher use Technology Augmented Reality. After implementation pre-test, the teacher discusses related question the previous pre -test given. Next, the learning process teach terminated with give strengthening to student. Then, give introduction short related technology Augmented Reality that will used for meeting learning next.

Meeting both are taking place for two hours. Learning started with Greetings, the teacher did presence, deliver objective learning, as well check readiness student. Furthermore, in the learning process the teacher introduces Augmented media Reality and the process of its use. Then, direct teacher form student into 5 groups

At stage this teacher welcome student tries Alone in use of technological media Augmented Reality in the learning process teach it, so that in implementation learning this time student allowed for access Mobile as a supporting medium learning during implementation learning. This meeting, students expected capable in describe and identify computer hardware.

Stage furthermore is student apply technology Augmented Reality as well as identify every hardware displayed computer. Stage Finally, the teacher reflects with give question to every group related a number of functions from computer hardware, and welcome student for submit question related what have not understood. After that, the teacher closes learning with conclude results learning at meetings this.

Meeting third held like timetable previously namely on Thursday, October 20, 2022 with same time. Learning started with Greetings, the teacher did presence, deliver objective learning, as well check readiness student. After Therefore, the teacher displays learning media form technology Augmented Reality and delivers explanation about previous material discussed.

Stage next is the teacher asks every representative the previous group has formed For convey what have obtained from given material through help technology Augmented Reality. Next, the teacher conveys that for measure understanding student related material that has taught with help technology augmented reality then, will give sheet test. After that is, learning terminated with gift sheet test form post-test by researchers.

3.1.1.3 Stage Observation

Teacher and student observation held as much three meetings in Cycle I. Observation this done during the learning process through application technology Augmented Reality. Observation This done for measure coherence between planning action already arranged with implementation in produce changes to activities students and teachers during implementation learning. Observation sheet This used by eye teachers another lesson as eye teacher observer lesson komjardas whereas researcher act as student observers during implementation learning.

Observation Results for 3 meetings show that implementation learning Still Not yet fully follow steps action learning that has designed. this because First time implementing learning media AR based inside class, teachers and students also not yet used to with situation class attended by the inner observer matter this is eye guru other subjects and researchers, students also still Embarrassed put forward opinion and submit question, and still Lots students who do activity addition during learning going on.

3.1.1.4 Stage Reflection

Based on results observation during the learning process teach takes place, then the average obtained in Cycle I is 67 or 44% of students who complete reach KKM value. this show that results action Not yet reach indicator 75 % success student. For results teacher and student activities as grain observation Not yet running optimally.

this because at the time study experience obstacle like a number of student chatting and joking so that raises commotion inside class, some student Still often request permission for go out class, student Not yet brave for ask and suggest his opinion, have disturbance in use technology Augmented Reality due at the moment installation application room storage student full. because it is necessary done repair for implementation Cycle II.

3.1.2 Implementation Cycle II

3.1.2.1 Stage Planning

Implementation action This II cycle the same with implementation in Cycle I. However, it is necessary exists repair for implementation Cycle II with see reference the obstacles that occur in Cycle I. With so, there is a number of solutions made For implementation this second cycle that is change pattern as well as student seats so that more maximum in accept material and reduce A little activity additions made by students _ like talking and joking , the teacher held quiz as well as games for awaken Spirit student as well as courage For appear in front Friend the class , the teacher should be appreciate active students during implementation learning as well as maximization application technology Augmented Reality. because it, researcher discuss related teachers' maximization implementation of the learning process teach. Whereas For test in Cycle II consists of 20 grains question Multiple Choice with material about PC assembly.

3.1.2.2 Action and Observation Stage

Stage the actions carried out in this Cycle II The same like Cycle I i.e. started with gift pre-test with different material that is related material PC assembly. Learning in this Cycle II done meeting 3 times. At stage this, execution learning done together with stage purposeful observation _ For record learning data during the learning process teach going on.

Meeting First after do pre-test that is gift material lesson related material PC assembly. Implementation learning in Cycle II in general. The same case with implementation learning Cycle I however, slightly exists enhancement that is learning going on in accordance with plans drawn up. After learning ends, then researcher return give test to student form post-test with time not enough more 30 minutes. Test This given For now changes in knowledge student after application technology Augmented Reality.

3.1.2.3 Stage Reflection

The results of reflection in Cycle II, namely discuss with the teacher, change pattern and student seating, held games as well as appreciate student with gift mark addition for active student's class proven Can overcome related obstacles in Cycle I implementation learning and activity student.

Study results Basic Computers and Networks increased from Cycle I to Cycle II. The average value of Cycle I, namely by 67 or 44% of students complete or value reach KKM. In Cycle II the average value was obtained that is by 76 or 78% of students complete or value reach KKM. Based on improvements the so Can concluded application technology Augmented Reality can increase results Study students on the material Computer Hardware. Based on matter such, research This resolved with using two actions different cycle.

3.2 Test Result Data

3.2.1 Cycle 1

3.2.1.1 Pre-Test Results

Pre-test held before apply technology Augmented Reality in the learning process in the classroom. Giving Pre-test aim for measure understanding beginning student about material to be they learn. Pre-test for material hardware computer This use test form choice double. Based on results pre-test values student grouped to in category Statistics descriptive. Statistics descriptive mark pre-test students in Cycle I got seen in table 3. following:

Table 3 Statistics Descriptive *Pre-Test* Value Students in Cycle I

Category	Mark
Top Rated	75
Lowest Value	35
Average value	62

Based on Table 3. Got concluded that pre-test Cycle I of 27 students class X TKJ I with mark highest 75, value the lowest is 35, and the average value is 62. As for the table completeness results Study students on the pre-test Cycle, I got seen in table 4. Following:

Table 4 Mastery Learning Outcomes Students in Cycle I Pre-Test

Mark	Amount Student	Percentage	Category
< 75	23	85%	No complete
≥ 75	4	15%	complete

Based on Table 4. results pre-test Cycle I ie there are 23 students No complete with percentage of 85%, and 4 students complete with percentage of 15% of amount student whole as many as 27 people.

Based on table distribution frequency results Study students on the pre-test Cycle I, got concluded that amount students who got mark No complete more Lots compared to with amount students who got mark complete. In matter this is KKM for eye lesson computer and network base i.e. 75, so for the learning process will base media applied technology Augmented Reality as

effort for increase results Study students in class X TKJ 1 at SMK Negeri 1 Bantaeng.

3.2.1.2 *Post-Test Result*

After applied technology Augmented Reality in the learning process then, students given test form Post-test For now knowledge student related material Computer Hardware. Post- test given form test choice double. Based on results post-test, mark student grouped to in category statistics descriptive. Statistics descriptive mark post-test students in Cycle I got seen in table 5. following:

Table 5 Statistics Descriptive Post-Test Values Students in Cycle I

Category	Mark
Top Rated	90
Lowest Value	40
Average value	67

Based on Table 5. can concluded that on the Post-test Cycle I, totaling 27 students class X TKJ 1 value highest obtained _ i.e. 90, value the lowest is 40, and the average value is 67. As for the table completeness results Study students on the post-test Cycle, I got seen in table 6. following:

Table 6 Mastery Learning Outcomes Students in Post-Test Cycle I

Mark	Amount Student	Percentage	Category
< 75	15	56%	No complete
≥ 75	12	44%	complete

Cycle I of 27 students class X TKJ 1 there are 15 students who do not complete with percentage of 56%, and 12 students who pass with percentage 44%.

3.2.1.3 *Observation*

Teacher Observation Results

Sheet results teacher observation is carried out for 3 meetings in Cycle I. Observation sheet This used by observers as observer teacher activities during the research process going on. As for the results of the teacher's observation, seen in table 7 Following:

Table 7 Recapitulation of Cycle I Teacher Observation Results

Meeting	Item Score Observation				Amount	Average Percentage
	1	2	3	4		
P1	-	-	11	-	33	75%
P2	-	-	11	-	33	75%
P3	-	-	9	2	35	79%
Average						76%

Based on results observation show that at the meeting First obtained results with an average percentage of 75% of 11 items observation obtained score 3 with category ok. At a meeting second obtained results with an average percentage of 75% of 11 items observation obtained score 3 with category ok. At a meeting third obtained results with an average percentage of 79% of 9 items observation obtained score 3 with category good and as much as 2 points observation obtained score 4 with category Good once.

Observation Results Student

Sheet results observation student done for 3 meetings in Cycle I. Observation sheet This used by the observer inside matter This researcher as observer activity student during implementation learning. As for the results observation student can see in table 8. following:

Table 8 Recapitulation of Observation Results Student Cycle I

Meeting	Item Score Observation				Amount	Average Percentage
	1	2	3	4		
P1	-	5	6	-	28	63%
P2	-	4	7	-	29	66%
P3	-	1	10	-	32	73%
Average						67%

Based on results observation show that at the meeting First obtained results with an average percentage of 63% of 5 items observation obtained score 2 with category enough and as many as 6 points observation obtained score with category ok. At a meeting second obtained results with an average percentage of 66% of 4 items observation obtained score 2 with category enough and as many as 7 points observation obtained score 3 with category ok. At a meeting third obtained results with an average percentage of 73% as much as 1 item observation obtained score 2 with category enough and as many as 10 points observation obtained score 3 with category ok.

3.2.2 *Cycle II*

3.2.2.1 *Pre-Test Result*

In Cycle II student given pre-test before return apply technology Augmented Reality in the learning process in the classroom. Pre-test given for measure understanding beginning student about material to be they learn. Pre-test for material assembly of this pc use test form choice double. Based on results pre-test values student grouped to in category Statistics descriptive. Statistics descriptive mark pre-test students in Cycle II can see in table 9.

Table 9 Statistics Descriptive Pre-Test Value Students in Cycle II

Category	Mark
Top Rated	85
Lowest Value	40
Average value	65

Based on Table 9. can concluded that on the pre-test Cycle II of 27 students class X TKJ 1 value highest obtained _ i.e. 85, value the lowest is 40, and the average value is 65. As for the table completeness results Study students on the pre-test Cycle II can see in table 10.

Table 10 Mastery Learning Outcomes Students in Pre-Test Cycle II

Mark	Amount Student	Percentage	Category
< 75	18	67%	No complete
≥ 75	9	33%	complete

Based on Table 10. can see that on the pre-test Cycle II of 27 students class X TKJ 1 there are 18 students who do not complete with percentage of 67%, and 9 students who pass with percentage 33%.

3.2.2.2 *Post-Test Result*

After applied technology Augmented Reality in the learning process then, students given test form Post-test for now knowledge student with different material _ that is pc assembly. Post- test given form test choice double. Based on results post-test, mark student grouped to in category statistics descriptive. Statistics descriptive mark post-test students in Cycle II can see in table 11.

Table 11 Statistics Descriptive Post-Test Values Students in Cycle II

Category	Mark
Top Rated	85
Lowest Value	40
Average value	76

Based on Table 11. can concluded that on the Post-test Cycle II, totaling 27 students class X TKJ 1 with mark highest 85, value the lowest is 40, and the average value is 76. As for the table completeness results Study students on the post-test Cycle, I got seen in table 12.

Table 12 Mastery Learning Outcomes Students in Post-Test Cycle II

Mark	Amount Student	Percentage	Category
< 75	6	22%	No complete
≥ 75	21	88%	complete

Based on Table 12. can see that on the post-test Cycle II of 27 students class X TKJ 1 there are 6 students who do not complete with percentage of 22%, and 21 students who passed with percentage 78%.

Based on results test learning students who have analysed in Cycle I and Cycle II with apply technology Augmented Reality on material Computer hardware experience improvement. it can see in table 13.

Table 13. Recapitulation of Learning Outcomes Students in Cycle I And Cycle II

No	Test	Cycle I	Cycle II	Improved Learning Outcomes
1	*Pre-test*	15%	33%	18%
2	*Post-test*	44%	78%	34%

Based on Table 13. can concluded that results pre-test Cycle I with percentage of 15% while in Cycle II the percentage results Study student i.e. 33%. this show that happens enhancement by 18% of results pre-test Cycle I and Cycle II. Then For results post-test in Cycle I percentage results Study student namely 44% while in Cycle II the percentage results Study student i.e. 78%. this show that happens enhancement by 33% of results post-test Cycle I and Cycle II.
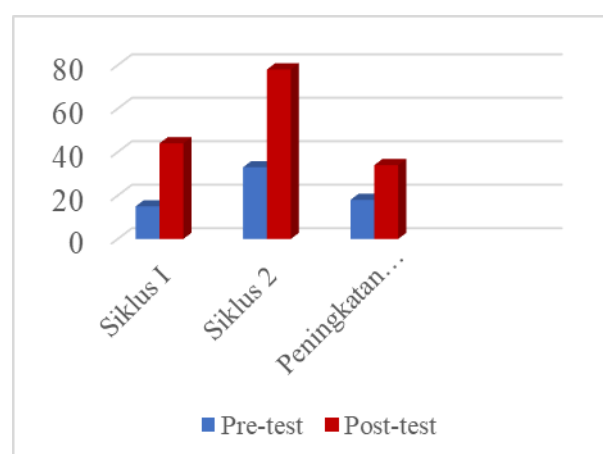

Figure 2. Chart Recapitulation Improved Learning Outcomes Student

3.2.2.3 *Observation*

Teacher Observation Results

Sheet results teacher observation is carried out for 3 meetings in Cycle II. Observation sheet This used by observers as observer teacher activities during implementation learning. As for the results of the teacher's observation, seen in table 14.

Based on results observation show that at the meeting First obtained results with an average percentage of 82% of 8 items observation obtained score 3 with category good and as many as 3 points observation obtained score 4 with category Good once. At a meeting second obtained results with an average percentage of 86% of 6 items observation obtained score 3 with category good and as many as 5 points observation obtained score 4 with category Good once. At a meeting third obtain the average yield percentage of 91% as many as 4 items observation obtained score 3 with category good and as many as 7 points observation obtained score 4 with category Good once.

Table 14 Recapitulation of Cycle II Teacher Observation Results

Meeting	Item Score Observation				Amount	Average Percentage
	1	2	3	4		
P1	-	-	8	3	36	82%
P2	-	-	6	5	38	86%
P3	-	-	4	7	40	91%
Average						86%

Based on results observation show that at the meeting First obtained results with an average percentage of 82% of 8 items observation obtained score 3 with category good and as many as 3 points observation obtained score 4 with category Good once. At a meeting second obtained results with an average percentage of 86% of 6 items observation obtained score 3 with category good and as many as 5 points observation obtained score 4 with category Good once. At a meeting third obtain the average yield percentage of 91% as many as 4 items observation obtained score 3 with category good and as many as 7 points observation obtained score 4 with category Good once.

Observation Results Student

Sheet results observation student done for 3 meetings in Cycle II. Observation sheet This used by the observer inside matter This researcher as observer activity student during implementation learning. As for the results observation student can see in table 15.

Table 15 Recapitulation of Observation Results Student Cycle II

Meeting	Item Score Observation				Amount	Average Percentage
	1	2	3	4		
P1	-	-	8	3	36	82%
P2	-	-	9	2	35	79%
P3	-	-	7	4	37	84%
Average						82%

Based on results observation show that at the meeting First obtained results with an average percentage of 82% of 8 items observation obtained score 3 with category good and as many as 3 points observation obtained score 4 with category Good once. At a meeting second obtained results with an average percentage of 79% of 9 items observation obtained score 3 with category good and as much as 2 points observation obtained score 4 with category Good once. At a meeting third obtained results with an average percentage of 84% of 7 items observation obtained score 3 with category good and as many as 4 points observation obtained score 4 with category Good once.

Interview Data

[1] Interview Results with Master

Based on results interviews that have done with an eye teacher lesson computer and network based on Mrs. Rohadijah, S.Pd who was housed in the room class X TKJ 1 SMK Negeri 1 Bantaeng that is that technology Augmented Reality is very good and more effective used in learning Because technology This characteristic interactive making student more active involved in the learning process . Besides that, use technology this is also relatively easy, simply with install applications on smartphones then, do a marker scan, students Already can see object hardware computer.

[2] Interview Results with Student

Based on results interviews that have done with a number of one of the students named Siti Maryam Tika who is housed in the room class X TKJ I SMK Negeri 1 Bantaeng that is Technology Augmented Reality is technology that can displays picture visuals become real. According to I, technology This easy used Because enough with do scan on the marker provided so Already appear device 3D objects loud and some information related object the. Technology this also works make it easy understand material computer hardware Because there is the fun in it.

4. CONCLUSION

1. Application technology *Augmented Reality* on material *hardware* computer at SMK Negeri 1 Bantaeng capable increase results Study student with

ok. this showed with exists increase in the average cycle I from 67 to 78 in cycle II. Percentage enhancement completed students by 34 % from 44% to 78%. Enhancement results Study student determined with achievement every aspect result categorized learning complete reach KKM value ≥75 with minimum percentage of 75%.

2. Interview results with student along with teachers about application technology *Augmented Reality* on material Computer *hardware,* that technology *Augmented Reality* is very good and more effectively used in learning Because technology This characteristic interactive and fun making student more active engaged and enthusiastic as well as easier understand material computer *hardware*. Besides that, use technology this is also relatively easy, simply with install applications on *smartphones* the, do a marker *scan*, students Already can see *hardware* 3D objects computer.

AUTHORS' CONTRIBUTIONS

Writer First role as conceptualization idea research to be done, as formal analysis with give techniques data analysis that can used in study this, as well validate results research that has done. Writer second role as data curation with processing data, giving description, at once ensure correct data from study this. Do investigation with do experiment and collect data. Writer third role in methodology, develop and design methodology used _ in study this, besides that too as supervision results research.

ACKNOWLEDGMENTS

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