DEVELOPMENT OF *BLENDED LEARNING-BASED* LACSA LEARNING MODELS DURING THE COVID-19 PANDEMIC TO IMPROVE STUDENTS' HOTS ABILITIES

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ABSTRACT

The ability to think at a high level is not only memorizing facts or concepts but also requires making something about these facts or concepts. Various studies reveal that *the higher-order thinking skills* (HOTS) of students in Indonesia are still low, coupled with the Covid-19 pandemic, which requires students to study online. For this reason, researchers develop learning models that invite students to learn, analyze, create, share and apply learning outcomes in life. The model developed is called LACSA, namely, *Learn it, Analyze it, Create it, Share it, and Apply it.* Lacsa learning model then saw its effect on students' high-level thinking skills. This quasi-experimental study used *a pretest-posttest nonequivalent control group design.* The research was conducted on two classes at SMPN 30 Tangerang City. One class is designated as a taught control class with K13 and one experimental class with LACSA learning. Data on students' high-level thinking skills and observation tests were then analyzed using descriptive statistics *one-way ANOVA*. The results showed that classes taught with a blended learning-based LACSA learning model *received* higher HOTS scores and differed significantly from K13 classes. In addition, lacsa's blended learning-based learning model has the potential to improve students' HOTS in both upper and lower academics. Therefore, the LACSA learning model based on *blended learning* during the Covid-19 pandemic is recommended for learning.

Keywords: *Higher Order Thinking Skills,* LACSA, *Blended Learning*

A. INTRODUCTION

Today, the education system is constantly changing as science and technology develop, especially information and communication technology, rapidly developing. So that the impact is very felt in the world of education, it is inseparable also in the state of the Covid-19 pandemic, which requires the world of education to change the learning process from initially face-to-face to online or distance learning.

This is a challenge for the world of education, especially for teachers and students who require them to do new things in the face of it. For the first time, teachers learn online using new approaches, models, strategies, methods, techniques, and tools/tools so that learning is by learning goals. According to Luthra & Mackenzi (2020), there are four ways Covid-19 is changing the way it educates future generations. First, the educational process around the world is increasingly interconnected. It was second, redefining the role of educators. Third, teach the importance of life skills in the future. Fourth, open more broadly the role of technology in supporting education.

According to Binkley *et al.* (2012), to be able to live in the 21st Century, ten skills that students must possess, these skills include creative thinking skills, critical thinking, metacognition thinking, communication, collaboration, information literacy, ICT literacy (Communication Information Technology), citizenship, work and career, and individual and social responsibility skills.

Based on the evaluation results from the *Programme for International Student Assessment* (PISA) in 2018, Indonesia in the fields of literacy, mathematics, and science, experienced a significant decline; Indonesia was ranked 70th out of 78 countries (OECD, 2019). For this reason, there is a need to improve the ability of both teachers and students in the learning process, especially during the Covid-19 pandemic.

High-level thinking skills in English referred to as *Higher Order Thinking Skills* (HOTS), are needed by students in facing the challenges of education today. HOTS is an ability that includes students' skills in analyzing *(analyzing),* evaluating *(evaluating),* and creating *(creating)*. Indicators that analyze, evaluate, and create are based on Bloom's

Taxonomy revision (Anderson and Krathworl, 2015).

Blended learning is one of the efforts to integrate various learning resources in suitable learning activities where students can interact and give each other ideas or innovations. Therefore, *blended learning* is very suitable for the situation during the Covid-19 pandemic because it combines face-to-face meetings with online materials provided by teachers simultaneously. According to Chaeruman (2018), the concept of blended learning system design models is closely related to blended learning and learning design models themselves. A model is a simple representation of physical phenomena' form, process, and function and more complex ideas (Gustafson & Brench, 2018).

In the current pandemic situation, changes in the learning system are needed to prepare students better to face the challenges of change in the 21st Century today. So to achieve this, there is a learning model developed to improve students' HOTS abilities, namely LACSA with the stages *of Learn it, Analyze it, Create it, Share it, and Apply it* based on *blended learning*. This learning model combines learning, analysis, creating, sharing, and applying.

The blended learning-based LACSA learning stages were developed based on the HOTS indicator in Bloom's Taxonomy revision. The suitability of these stages is expected to contribute to the improvement of learning outcomes in students' HOTS abilities.

Based on the description above about the *Learn it, Analyze it, Create it, Share it, and Apply it* based on *blended learning*, research was conducted on developing the LACSA model in IPA learning. The model is further applied in the classroom to see the improvement of students' HOTS abilities reviewed from different academic abilities. This quasi-experimental research was conducted in class IX SMPN 30 Tangerang City. This is based on the thinking, according to Fuad (2018), that the best learning model when it matches student characteristics and can empower students' thinking skills in the upper academic and lower academic groups.

B. Concepts And Theories That Underpin The Work Of Learning Innovation

1. *Higher Order Thinking Skills* (HOTS)

The skills needed in the 21st Century are higher-*order thinking skills* (HOTS) that are indispensable in preparing students for global challenges. The skills needed include Critical thinking and problem-solving skills (*Critical Thinking and Problem-Solving Skills*), Communication Skills (*Communication Skills*), creativity, innovation, and collaboration. High-level thinking is critical in the 21st Century because it is the era of information and technology. One must respond to change quickly and effectively, thus requiring flexible intellectual skills, analyzing information, and integrating various sources of knowledge to solve problems (Ministry of Education and Culture, 2017).

Wibawa and Agustina (2019) explained that learning based on *Higher Order Thinking Skills* (HOTS) is a process of thinking students at a higher cognitive level developed from various cognitive concepts and methods and learning taxonomies such as *problem-solving* methods, bloom taxonomy, and taxonomy of learning, teaching, and assessment.

In Bloom's revised taxonomy by Anderson and Krathwohl (2015), three aspects of the cognitive realm are part of the ability to think *high or Higher Order Thinking*. The three aspects are the analysis aspect, the evaluation aspect, and the creating aspect. Three other aspects in the same realm of low-level thinking ability *(Lower Order Thinking)* are remembering, the aspect of understanding, and the aspect of application (applying).

The importance of optimizing high-level thinking skills in learning is based on the fact that some students have not been able to connect the knowledge that has been learned in school with how to implement it in real life (Usmaedi, 2017).

Acesta (2020) suggests that high-level thinking skills are obtained from the student's experience in the following learning to construct and build knowledge in him so that he has awareness in the learning process. Learning like this makes students can develop and have the ability to reason.

While Kurniati *et al.* (2016) mentioned that *Higher Order Thinking Skills* (HOTS) would occur when a person associates new information with information that has been stored in his memory and relates it, and reorganize and develop the

information to achieve a goal or find a solution of a difficult situation to solve.

2. *Blended Learning*

Thorne (2003) in Chaeruman (2018) mentioned that *blended learning* is generally understood as a learning process that combines face-to-face and online learning. Blended *learning* is an opportunity to integrate the advancements of innovation and technology offered online with the interaction and participation offered in traditional learning.

Blended learning is referred to as integrating approaches and technologies with face-to-face and online, carefully selected and complementary (Garrison & Vaughan, 2008; Machumu *et al*, 2018). Based on the definition of Garrison and Vaughan, *blended learning* adapts the principles of practice and critical thinking in two effectiveness, first there must be a foundation of integration between face-to-face and online learning to create useful academic learning. Secondly, innovative technologies are used by teachers and students primarily for quality improvement and effectiveness (Norberg *et al*, 2011). Both affectives achieve the principle of collaborative learning where the main focus is to support, improve and improve the learning process.

Donnelly (2009) in Machumu (2018) states that *blended learning* is an intellectually stimulating process that involves an educational environment that allows students to share training, challenge each other, and actively engage in developing new learning experiences.

Wannapiroon (2014) mentioned that *blended learning* is divided into two stages, namely the preparation stage and the learning stage. Norberg *et al* (2016) added that in *blended* learning, learning designers must choose and determine the right strategy between the two to achieve learning goals. Therefore, in *blended* learning must emphasize the learning experience, both in planning and designing.

3. Syntax in LACSA Learning

LACSA learning is a learning developed to invite students by having short for learning *(Learn it)*, analysis *(Analyze it)*, create *(Create it)*, share *(Share it)* and apply *(Apply it)*.

a. *Learn it*

Learning as a process of behavior change as a result of some form of experience, activity, training, observation and the like. Learning is also defined as the relatively permanent process of behavior change that occurs as a result of practice and experience (Tomar and Jindal, 2014). In the learning process it is very important for students to learn the material to be discussed by exploring it or studying from various sources, while the teacher directs students to do individual learning. Learning the subject matter can be done with various sources, anywhere and with anything.

b. *Analyze it*

Analysis is the process of breaking matter into small parts and determining how the relationship between parts and between each part and its overall structure (Anderson and Krathwohl, 2015). In this case there will be a big *question (big question)* from the pieces of information he has. Anderson and Krathworl (2015) add that classified educational goals in analyzing learning covering important relevant pieces of information, determining how to organize those pieces of information, and determining the purpose behind that information.

c. *Create it*

In Bloom's Taxonomy revision by Anderson and Krathwohl (2015) Creating or creating is a process that involves arranging elements into a coherent or functional whole. Students are required to create products by reorganizing a number of elements or parts into a pattern or structure. The copyright process exists into three stages, namely problem description, solution planning and solution execution.

d. *Share it*

Sharing or sharing activities are a form of communication carried out by students in front of crowds or other students. At this stage students communicate the results of copyrights or products that have been made in the form of presentations with various media, both powerpoints, mid maps, posters, videos, and other media.

e. *Apply it*

At the stage of applying or applying is an application in life that involves the use of procedural that has been done in the activities of previous students. Students must understand the types of problems and alternative procedures that have been created by students. In this stage, teachers can evaluate the results of student work after doing the learning process.

C. Results And Discussions
a. Basic Ideas

This innovation work is based on the current situation, namely the Covid-19 pandemic in 21st century learning where students must experience high-level thinking skills. Based on Bloom's Taxonomy that has been revised by Anderson and Krathwohl, *higher order thinking skills* are analytical aspects, evaluation aspects, and creating aspects. Using the HOTS standard as one of the international standards is needed to improve the quality of education. By having HOTS students are expected to be able to answer the challenges of the 21st Century, where a student is not only enough to think and understand, but must be able to analyze, evaluate and create.

In the current Covid-19 pandemic situation, there is no one learning model that is very capable to be applied to all students with various conditions. A learning model can be said to be good and useful if the syntax corresponds to the characteristics of the conditions of a class. But so far, innovations developed in the form of learning media and learning resources created or developed by teachers. In the development of this model, researchers want teachers and students to be able to utilize and develop existing media or learning resources.

Blended learning is also still rarely used. *Blended learning* is commonly known as face-to-face and online mixed learning, but in the current condition must pay attention to health protocols. Face-to-face is not as long as it is in class, but can use applications that can replace the learning such as face-to-face learning such as zoom, google meet, webex, and other learning media.

Innovation work in the form of learning models should also accommodate the abilities of all students. Then it is also necessary to develop a learning model that is not only able to improve academics up or down, but needs to be inserted activities that involve students with upper and lower academic abilities together.

In order to achieve these goals, the LACSA learning model was developed, where in mentioning the word is familiar to the people of Tangerang City because of the characteristics of one of the foods in Tangerang City. This model has syntaxes, namely learn *(Learn it)*, analyze *(Analyze it)*, create *(Create it)*, share *(Share it)* and apply *(Apply it)*. This model is expected to improve (1) *higher order thinking skills* (HOTS), (2) train students to utilize and develop existing media or learning

resources, (3) narrow the ability gap in students' upper and lower academic abilities.

The first syntax is *learn it* will familiarize students to learn by exploring it or learning from various sources of learning materials. This activity will cause students' independence in reading. Learning will also arouse students' curiosity to learn more. *Analyze it* is the next syntax of the previous stage. Once the student studies the student will be on the catalysis and will raise big questions about his curiosity. This big question will familiarize students to have critical and creative thinking. *Create it* invites students to design, develop or create a product or result with their creative ideas. In the next hold *Share it,* students are asked to communicate and present the findings, products, or results of student discussions through learning media such as powerpoints, mind maps, posters or other media. The last stage is *Apply it,* inviting students to apply, implement, demonstrate, solve or use their work in the form of works, videos, or other products. In this last stage, teachers can evaluate and reward what students have done in the learning process.

b. Design of Learning Innovation Works

The design of innovation works developed in the form of LACSA learning models. This learning model was developed through a series of development research that has been conducted with reference to the Dick & Carey model (Dick *et al.*, 2015). Lacsa's learning model syntax and student and teacher activities are presented in table 3.1 below.

Table 3.1 LACSA Learning Model Syntax and Learning Media

NO	SINTAK	TEACHER ACTIVITIES	STUDENT ACTIVITIES	Learning Media during the Covid-19 Pandemic
1	*Learn it*	• Direct students to learn or explore it from various sources related to the material to be studied or investigated	• Study or explore from various sources related to the material to be studied or investigated	• Zoom • Teams • Google Meet • Cisco Webex • Whatsapp • Google Classroom • Slack • Trello
2	*Analyze it*	• Ask students to analyze and make big questions	• Analyze and make big questions	• Google • E-book
3	*Create it*	• Encourage and provide opportunities for students to design, develop or	• Design, develop or create a product or outcome with creative ideas	• Tools and materials from the surrounding environment

NO	SINTAK	TEACHER ACTIVITIES	STUDENT ACTIVITIES	Learning Media during the Covid-19 Pandemic
		create a product or outcome with their creative ideas		
4	Share it	• Provide students with the opportunity to communicate and present the findings, products, or results of student discussions through learning media such as powerpoints, mind maps, posters or other media	• Communicate and present the results of findings, products, or discussion results through learning media such as powerpoints, mind maps, posters or other media	• Power point • Mind map • Poster • Board • Video
5	Apply it	• Invite students to apply, implement, demonstrate, solve or use their work in the form of works, videos, or other products • Giving awards in the form of additional points to students for the work that has been made well	• Apply, implement, demonstrate, solve or use their work in the form of works, videos, or other products • Get additional points for the work that has been made	• Daily activities • Video • Powerpoint Evaluation • Google form • Quizizz • Educandy

c. Discovery/Update Process

This innovation work goes through three stages of research, namely:

1.Preliminary research

At this stage, the profile of students' high-level thinking skills is revealed. The research population consists of 68 students of class IX SMPN 30 Tangerang City spread across two classes. The research sample amounted to 34 students taken with *stratified random sampling* techniques. Each class is grouped into three groups representing the upper, medium, and lower academic abilities. Determination of academic ability groups based on student rankings. Table of population and sample numbers presented in table 3.2

Table 3.2 Population and Research Samples

Class	Academic Ability	Number (of students)	Sample
IX A	Above	10	5
	Keep	14	7
	Below	10	5
IX B	Above	10	5
	Keep	14	7
	Below	10	5
Sum		102	34

Therefore it is necessary to conduct development research to improve these variables.

2.Development Research

The development of this innovation work includes the development of lacsa learning models that are operationally carried out by developing models along with learning devices that refer to the Dick & Carey model (Dick *et al.*, 2015). The development step in this research consists of 10 steps. The learning development flow using a modified model is presented in Figure 3.1 below.
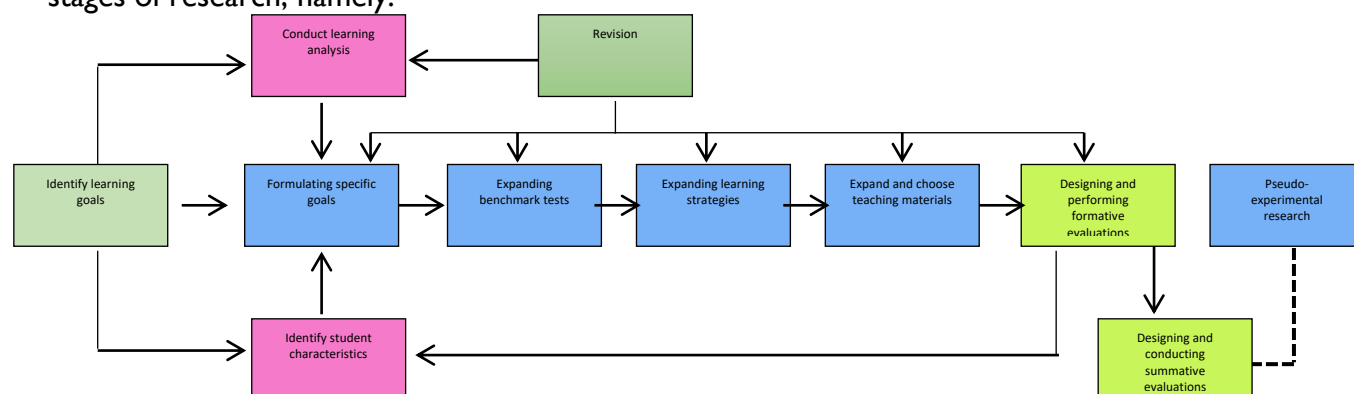

Figure 3.1 Learning Development Modifications from Dick & Carey (Dick *et al.*, 2015)

a. Identify learning goals

The first stage in the development of learning is to determine the goals related to the achievement of competencies by students. These

goals can be analyzed using *a need assessment.* Needs analysis has been conducted during preliminary research through the provision of high-level thinking skills tests for grade IX students.

The purpose of this goal is studied based on KI and KD in the 2013 curriculum. Related to the context of this research, according to the curriculum that applies in the school where the research is 2013 curriculum during the Covid-19 pandemic, ki and KD analysis is carried out on the subjects of IPA class IX even semester as referred to the standard content of Permendikud N0 21 of 2016 and Kepmendikbud No. 719 / P / 2020 concerning the implementation of curriculum in education units under special conditions with reference to Core Competencies (KI) and Basic Competencies (KD) IPA Even semester on biotechnology materials.

b.Conducting learning analysis

This second step aims to identify skills that must be mastered by students. This stage produces a map that shows the interrelationships between competencies. Analysis of IPA learning competencies that focus on high-level thinking skills.

c. Identify student characteristics

This stage aims to study students based on initial knowledge, level of cognitive development, and gender used as input in compiling developed learning devices.

In accordance with the order of learning of IPA SMP class IX curriculum 2013 under special conditions during the Covid-19 pandemic, the material for class IX even semester that will be used in research is about biotechnology. By the time of students in class VII, they have obtained materials related to the system of organization of living life and in class IX the previous material discusses the inheritance of nature. Based on these conditions, students already have knowledge provisions or knowledge prerequisites to study IPA materials in junior high school class IX.

In this study, the subject of the study was junior high school students who were generally aged 14-16 years. Based on Piaget's level of cognitive development, students have been at the formal operational stage so that students are allegedly able to understand abstract and logical thinking. According to Ibda (2015) in his journal it is written that at the age of 12 years and above, students can use concrete operations to form more complex operations.

d. Formulate specific goals

At this stage of formulating specific goals, it becomes a guideline for determining the model and developing the test instrument.

e.Develop benchmark reference test items

At this stage, the development of test instruments is carried out which begins with the development of grids, question points, and assessment rubrics to make measurements of bound variables from research.

f.Develop learning strategies

The initial langah in the development stage of this strategy is the selection of learning strategies, the presentation of materials that include the development of the Learning Implementation Plan (RPP) and learning activities. Rpp development refers to the format of the National Education Standards Agency (BSNP).

g. Develop and select teaching materials

Teaching materials in this study are in the form of curriculum books 2013 revision 2018 and student activity sheets (LKS). LKS is also developed based on the syntax characteristics of the LACSA learning model.

h. Designing and carrying out formative evaluations

At this stage it aims to collect data to revise learning devices that have been developed. The results of the evaluation are then used to be input to improve learning devices. The developed device has been equipped with a test grid and test instruments.

At this stage there are three types of formative evaluations used to be applied in developing learning devices, namely expert validation, small group trials and field trials but still online by complying with health protocols during the Covid-19 pandemic.

Validation from experts / experts also aims to meet the requirements to validate the contents of learning devices that have been developed in research. Validators in this development research come from experts, namely Bambang Afriadi, S.Pd, M.Pd (education lecturer who has studied master's program research and evaluation of education) and Jamilah, S.Pd (teacher of junior high school IX subjects). This stage is intended to produce a valid learning device based on the advice of experts / experts so that it is feasible to be used during the trial of the validated learning device design to then

be revised by experts / experts into input for revision or improvement.

This development research was conducted on students at SMPN 30 Kota Tangerang in February 2019. The trial for learning models and devices involved 34 students to obtain data on the implementation of learning models while still complying with the online health program.

i.Revise learning

Furthermore, in the last process of this development, there is the revision and implementation of the learning devices developed.

j. Develop and carry out summative evaluations

The end of the evaluation to find out the effectiveness of the learning that has been developed is to conduct a summative evaluation, but in general this step is not part of the learning development process, but the application of the developed devices in a wider scope. The purpose at this stage is to analyze the effectiveness of the use of learning devices that have been developed. Summative evaluation is carried out by researchers in the form of the application of devices that have been developed and revised. The application of such devices is made in the form of pseudo-experimental research.

3. Pseudo experimental research

In this study was conducted to test the learning model developed in the real classroom. The study treated and measured the consequences of treatment by not using random samples to infer changes caused in testing lacsa's learning model. The implementation is described in the following practical application of learning.

d. Practical Applications in Learning

The type of research used in this study is a *quasi experiment* with the design *of Nonequivalent Control Group Design* (Sugiyono, 2012). This study was conducted by giving treatment to the experimental group and providing the control group as a comparison by providing *pretest-postest.* The free variables in this study are the learning model (LACSA based on *blended learning* using various media and K13 using only google classroom) and academic ability, while the bound variable is *higher order thinking skills* (HOTS). The design of quasi-experimental research is found in table 3.3 below.

Table 3.3. Pseudo-experimental research design

Pretest	Group	Post
O_1	X_1A_1	O_2
O_1	X_1A_1	O_2
O_1	X_1A_1	O_2
O_1	X_1A_1	O_2

Information:
O_1= Pretest score, O_2= Postest score
X_1= K-13, X_2= LACSA
A_1= Academic ability down, A_2= Top academic ability
(Source: Fuad Revision, 2018)

The subject in this study was a student of class IX SMPN 30 Kota Tangerang with a population spread across two classes. Students of IXA SMPN 30 kota Tangerang as an experimental class, are taught using a *blended learning-based* LACSA learning model. The control class is a student of class IXB SMPN 30 Tangerang City who conducted K13 learning.

In each treatment class, students are divided into three groups based on *pretest* scores from highest to lowest. 10 students with the highest grades are designated as the Upper Academy (AA) group, while the 10 students with the lowest grades are designated as the Lower Academic group (AB). The rest is included in the Medium Academic (US) group. The group is divided into small groups that are already directed at Google Meet and through Google Classroom. Each group consists of five students consisting of 1 student from AA, 3 students from the US, and 1 student from AB.

While in the control class using K13 *science approach* learning which is generally applied 5M activities, namely observing, menanya, collecting information, processing, and communicating. In experimental classes, learning is carried out by applying a learning model *learn it, analyze it, create it, share it* and *apply it* (LACSA) based on *blended learning*.

As for the data collection instrument, it consists of 20 valid question points with the form of multiple choice questions with four answers, namely a, b, c, and d. For hypothesis testing is carried out on condition that the data is distributed normally and homogeneously. As for the analysis of research data, it is carried out with several tests, namely, descriptive analysis, normality test, *paired sample t test*, homogeneity test, and *independent sample t test*. Then conducted an analysis with IBM *Statistical Package for the Social Sciences* (SPSS) for window version 20.

e. Practical Application Results Data of Learning Innovation

The following is presented experimental class data using LACSA-based learning models based *on blended learning* and control classes with K13 learning using google classroom only.

Table 3.4 Class research results data

CODE	Experimental Class Pretest	Experimental Class Posttest	If	Control Class Pretest	Control Class Posttest	If
1	38	72	1	52	72	2
2	50	76	1	46	72	2
3	38	80	1	50	72	2
4	40	90	1	56	90	3
5	76	98	3	58	76	2
6	60	82	2	50	76	2
7	52	74	2	56	90	3
8	58	84	2	44	72	2
9	74	80	3	40	76	1
10	72	84	3	64	86	3
11	52	82	2	60	82	3
12	40	80	1	52	80	2
13	36	78	1	58	82	3
14	60	82	2	50	72	1
15	52	76	2	48	72	2
16	72	90	3	46	80	1
17	74	84	3	48	78	2
18	36	72	1	44	88	1
19	65	76	2	40	80	1
20	38	76	1	50	84	1
21	58	86	2	50	72	1
22	60	82	2	56	80	3
23	58	86	2	46	78	2
24	40	96	1	40	78	1
25	58	85	2	64	84	3
26	52	76	2	56	80	2
27	76	98	3	56	74	2
28	66	84	3	60	88	3
29	58	78	2	60	82	3
30	72	82	3	46	80	2
31	52	82	1	44	80	1
32	66	80	2	56	74	2
33	76	88	3	44	80	1
34	76	96	3	72	90	3
Average	57	83		52	79	

Experimental Class: LACSA based *on blended learning*
Control Class: K13 Learning
Academic: 1 = lower academic, 2 = medium academic, 3 = top academic

f. Data Analysis of Practical Application Results of Learning Innovations

1.Test Statistical Analysis on Learning Models

After research, further analysis of data from both classes was carried out. First, descriptive analysis is carried out to describe and describe research data, covering the amount of data, maximum value, minimum value, average value and so on. It was obtained that the students' high-level abilities in the student's posttest results using the *BLENDED learning-based* LACSA learning model were higher at 98 than the control class which was 90. The results of descriptive analysis data analyzed using IBM SPSS version 2.0, can be seen in table 3.5 below.

Table 3.5 Descriptive Analysis Results

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Experimental Pretest	34	36	76	57.38	13.434
Experimental Posttest	34	72	98	82.79	6.953
Control Pretest	34	40	72	51.82	7.649
Control Posttest	34	72	90	79.41	5.711
Valid N (listwise)	34				

Furthermore, normality tests were carried out in both classes, normality tests were carried out to find out whether the research data was distributed normally or not. Normal data is an absolute requirement before performing parametric statistical analysis. Based on table 3.6 it can be seen that all variables have a sig value. *Levene's Test of Equality of Error Variance* > 0.05, meaning that all data on each variable has been homogeneous.

Table 3.6 Normality Test Results

Tests of Normality		Kolmogorov-Smirnov[a]		
Class		Statistic	df	Itself.
Student Learning Outcomes	Experimental Pretest	0.137	34	0.103
	Experimental Posttest	0.137	34	0.106
	Control Pretest	0.124	34	.200*
	Control Posttest	0.135	34	0.117

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

To answer how the influence of the *BLENDED learning-based* LACSA learning model on students' *Higher Order Thinking Skills* (HOTS) abilities. Furthermore, it was conducted on the pretest data of the experimental class with the posttest of the experimental class using a BLENDED learning-based LACSA learning model. Then the control class pretest data with the control class posttest data uses K13.

Based on table 3.7 output pair 1 obtained sig (2-tailed) of 0,000 < 0.05, it can be concluded that there is a difference in the average ability of HOTS students with pretest experimental classes with posttest experimental classes using *a blended learning-based* LACSA learning model.

As for the output pair 2 obtained sig (2-tailed) of 0.000 < 0.05, it can be concluded that there is a difference in the average student learning outcome for pretest control class with posttest control class using K13 learning.

Tabel 3.7 Uji Paired Sample T Test

Paired Samples Test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Experimental Pretest - Experimental Posttest	-25.412	11.675	2.002	-29.485	-21.338	-12.691	33	.000
Pair 2	Pretest Control - Posttest Control	-27.588	7.182	1.232	-30.094	-25.082	-22.398	33	.000

Student Learning Outcomes	Equal variances assumed	.614	.436	2.192	66	.032	3.382	1.543	.301	6.463
	Equal variances not assumed			2.192	63.597	.032	3.382	1.543	.299	6.466

Based on *the output of independent sample t tests* obtained sig values. (2-tailed) of 0.032 < 0.05, it can be concluded that there is an average difference in students' HOTS ability between learning models using LACSA-based *blended learning* and K13 learning.

2. Discussion of Statistical Analysis Test on Learning Models and Academic Ability

From several statistical tests conducted using the IBM *Statistical Package for the Social Sciences* (SPSS) for window version 20, namely descriptive analysis, normality tests, *paired t test samples*, homogenity tests, and *independent t test samples*. Then it can be seen that there is an influence and unity between the use of LACSA learning models based on *blended learning* by using *science approach* in K13. From the results of the *paired sample t test,* it is stated that there is an influence of the LACSA learning model based on *blended learning* on students' HOTS ability in IPA subjects. So it can also be seen from the average pretest and posttest scores in each class, namely the improvement of students' HOTS abilities taught using blended learning-based LACSA learning models, then this shows that the LACSA learning model is able to improve students' HOTS ability in IPA lessons.

In the LACSA learner model based on *blended learning* students are asked to learn independently in advance this is in line with putra *et al* (2017) statement that self-learning can improve learners' learning outcomes. Self-study activities are one form of learning activities that focus on one's learning awareness and give students more flexibility in learning.

After conducting *an independent t sample t test* to both classes, it can also be seen that the difference in student HOTS averages between learning models using LACSA based *on blended learning* using *science approach* in K13. This answers the formulation of the problem of the difference in *Higher Order Thinking Skills* (HOTS) between lower academic ability students (AB) and upper academics (AA) on two different learning models.

High-level abilities are important to apply in learning, especially in making questions that are

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It can be concluded that there is an influence of *the BLENDED learning-based* LACSA learning model on students' HOTS abilities in IPA subjects. Then it can also be seen the descriptive statistical output in table 3.8 in the *paired sample statistics test* by looking at the average pretest and posttest scores in each class, namely the improvement of students' HOTS ability, then this shows that the BLENDED LEARNING-based LACSA learning model is able to improve students' HOTS ability in IPA lessons.

Table 3.8 Descriptive *paired sample statistics*

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Experimental Pretest	57.38	34	13.434	2.304
	Experimental Posttest	82.79	34	6.953	1.193
Pair 2	Control Pretest	51.82	34	7.649	1.312
	Control Posttest	79.41	34	5.711	.979

The next stage of the test is, the homogeneity test, the homogeneity test is carried out using *one way anova* with the aim of finding out whether the variance of experimental class posttest data using the LACSA learning model based on *blended learning* and the control class posttest data using K13 is homogeneous or not. Based on the output it is known that the significant value (Sig.) is 0.436 > 0.05, so it can be concluded that the variance of experimental class posttest data and control class posttest data is the same or homogeneous.

Table 3.9 Homogeneity Test Results

Test of Homogeneity of Variances			
Student Learning Outcomes			
Levene Statistic	df1	df2	Itself.
.614	1	66	.436

To answer whether there is a difference in student learning outcomes using a *BLENDED learning-based* LACSA learning model with K13 learning to students' *Higher Order Thinking Skills* (HOTS) abilities. So to answer the *independent sample t test*, the experiment class posttest data is carried out, namely using a LACSA learning model based on *blended learning* with the postetest data of the control class using K13 learning. The results of the *independent t test can* be seen in table 3.10 below.

Table 3.10 *Independent Test Sample t Test*

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Itself.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper

tested to students. High-level ability is a cognitive process that includes analysis, evaluation and creation (Arif, 2019). So this is in line if using a BLENDED learning model based on *BLENDED LEARNING* during the Covid-19 pandemic. The ability to think at a high level is not only memorizing facts or concepts but also requires to make something about these facts or concepts. Bloom's Taxonomy revision (Anderson and Krathworl, 2015) states that learning something doesn't always have to start at a low-level cognitive level and use all levels of verbs, but it's possible to use verbs at a certain level. So this strengthens the LACSA learning model which has stages, namely *Learn it, Analyze it, Create it, Share it, and Apply it* based on *blended learning*.

Based on the questionnaire provided using google form can also be concluded about the advantages and disadvantages of the LACSA learning model based on *blended learning* that is (1) learning trains students to be active, creative, fun and better understand the material taught, (2) motivate students to ask questions directly, discuss more purposefully and increase student confidence even though using online learning media, (3) Learning is not monotonous and not boring and not only focuses on concepts but can apply them in everyday life.

Based on questionnaires and observations online can also be described about the constraints and disadvantages of implementing this *blended learning-based* LACSA learning model that (1) the use of media online needs to be habituated by students to use it, (2) because learning takes place online, students are constrained in quotas, (3) teachers must be ready to guide students who are less active in asking questions, (4) require good learning preparation, especially time, (5) Habituation of students to read independently.

Based on the results of the questionnaire discussion and study, the *BLENDED learning* model-based LACSA learning model needs to be applied during the Covid-19 pandemic to improve students' high-level abilities. This ability needs to be trained and accustomed because it is an ability that is needed in the 21st Century during the Covid-19 pandemic.

g. Dissemination

This activity was carried out at the MGMP IPA SMPN 30 Forum in Tangerang City and together with smpn 30 teachers in Tangerang City which was attended by 23 teachers and principals on Friday, February 5, 2021. Based on the results of the desimination carried out there are several inputs, including the following:

1. It is necessary not to continue between teachers to develop this learning model in different subjects.
2. There needs to be seminars or training between teachers to use online learning media.
3. There needs to be guidance to teachers for the creation of high-level thinking questions.

D. CONCLUSIONS

From the results of the research conducted, it can be concluded that:

1. The *blended learning-based* LACSA learning model affects students' *Higher Order Thinking Skills* (HOTS) ability, based on statistical analysis tests that students who follow the blended learning model of BLENDED LEARNING-based LACSA score higher and differ significantly when compared to students in K13 learning.
2. There is an average difference in *Higher Order Thinking Skills* (HOTS) ability between lower academic ability (AB) and upper academic (AA) students in the two LACSA learning models based on *blended learning* and using K13.
3. The advantages of the *BLENDED learning* model are (1) learning to train students to be active, creative, fun and better understand the material taught, (2) motivate students to ask questions directly, directed and increase student confidence online, (3) learning is not monotonous and boring and can apply it in everyday life. The weakness of the model is, (1) the need for student habituation to use media, (2) students are constrained in quotas, (3) teachers must be ready to guide students who are less active in asking questions, (4) require good learning preparation, (5) habituation of students to read independently.

Suggestion

Some of the suggestions submitted related to the application of the results of this study are as follows:

1. There needs to be further research for the implementation of lacsa learning models based on *blended learning* face-to-face.

2. The learning model in schools should focus on students *(student centered) by* paying attention to aspects of student diversity and their usefulness to train *higher order thinking skills* (HOTS) students.

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This manuscript has participated in the "Learning Innovation Work Competition for Tangerang City Middle School Teachers in 2021". 2nd Winner of the Learning Innovation Competition for Middle School Teachers in the Context of the 28th Anniversary of the Tangerang City Education Office 2021 with the original author Mariatul Qibtiah, while Bambang Afriadi as Editor and Translator. The original title presented in the competition was "Pengembangan Model Pembelajaran LACSA Berbasis *Blended Learning* Pada Masa Pandemi Covid-19 Untuk Meningkatkan Kemampuan Hots Siswa"

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