
Teacher's Delivery Format and ADDIE Model to Adjust the Online Learning System during the Pandemic Period

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Abstract

The type of the research is research and development by using the ADDIE model. The ADDIE model of instructional design is a generic instructional model that provides an organized process for developing instructional materials. This systemic model is a five-step cyclical process that can be used for both traditional and online instruction. The five steps are analyzing, designing, developing, implementing, and evaluating. The sample of the research were 36 students of Biology study program at one public university in Sulawesi Barat. The learning tools developed consist of semester learning plan (RPS), lecture contracts, learning media, and evaluation instruments. The research found that the validity of the learning device was 90.4% and in the very valid category with minor revisions. Then, the practicality of learning devices based on the implementation of RPS and observation results was 94% which indicates a very practical category to use. The effectiveness of learning devices based on student learning test results was 80.45% which indicates an effective category. Thus, the results of this research were valid, practical, and effective.

Keywords

Development, learning tools, online learning, pandemic, research and development

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Introduction

The Covid-19 pandemic that hit the world has implications for all aspects, not least in education praxis. Responding to this, the government through the Ministry of Culture, Education, Research and High Education issued the circular Letter No. 4 of 2020 on the conduct of online learning, ranging from the elementary school level to universities. The learning process that was originally carried out face-to-face in the classroom is transferred to the online learning process, so that all learning is carried out by teachers and students from their respective homes/places of existence. The basis for the temporary closure of educational activities in schools and campuses due to the readiness of all parties (teachers, students, communities, and the government) is not adequate. The ministry does not support learning activities with strict health protocols during the Covid 19 pandemic. The circumstances in question, including the provision of facilities, tools, personal protective equipment (APD), and habituation attitudes behave disciplined obeying the rules of protocol covid-19 (still low). This condition is a challenge as well as an opportunity for teachers to transform the learning process from offline systems to online systems (Pusdiklat Kemdikbudristek RI, 2020)

Online learning is an advancement from conventional distance learning that still uses printed teaching materials such as books or modules. In the era of conventional distance learning, there is no technology that allows information sharing like the current era, where all information can be connected to the internet. According to Anderson and McCormick (2005), there are 10 principles in online learning, including related to curriculum, planning, material design, learning process, teaching process, and assessment. This principle can be achieved if the learning tools used in the implementation of online learning are designed and made in accordance with the needs of curriculum and learning characteristics.

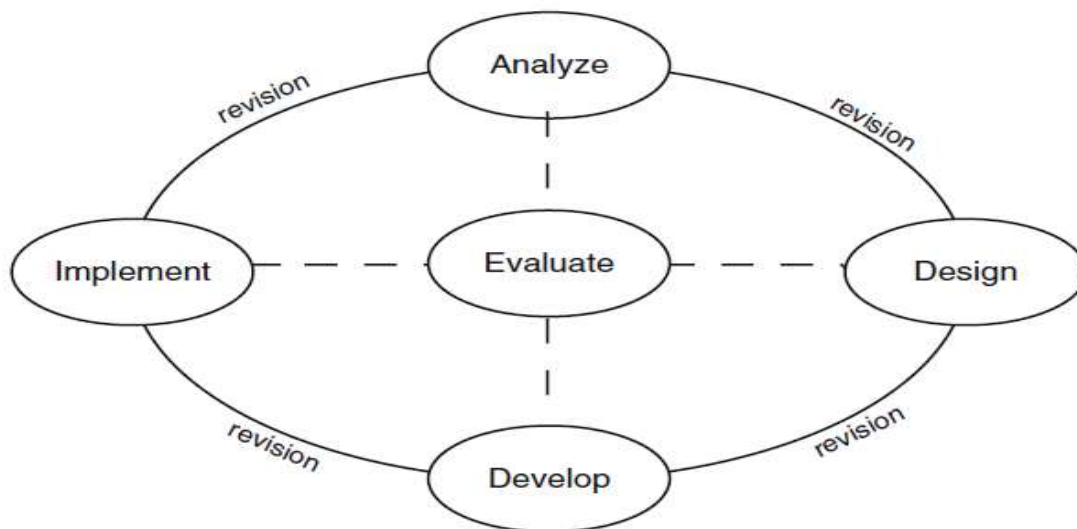
Currently, the main problem for lecturers to enter the lecture process in the Odd Semester TA 2020/2021 is that the learning tools available are still in the form of learning devices designed for face-to-face meetings and have not adapted to online / non-face-to-face learning, including learning devices in Learning and Learning Courses at FKIP West Sulawesi University. The preparation of learning devices is the initial stage in learning. According to Nababan and Tanjung (2018), the quality of the device used determines the quality of learning to be produced, so the learning device must be carefully arranged. If the problem is not immediately addressed, then it can be ascertained that the learning process will run in no uncertain direction. This is due to several factors including: (1) on the learning device, there is a lecture contract. The lecture contract is important to be conditioned in accordance with the Covid-19 situation. In the lecture contract will be contained a contract agreement between lecturers and students for one semester. In this contract, it is also necessary to emphasize the policy of lecturers if there are students who are constrained by networking during the learning process. (2) On the learning device there is a semester learning plan (RPS). RPS contains materials that will be taught in accordance with the lecture schedule. RPS must also adjust to the online / non-face-to-face learning process because it will have a direct effect on the substance and depth of the material to be achieved. (3) In the learning device there are teaching materials and teaching media.

The selection of the right teaching materials and media determines the continuity of learning. There needs to be adjustment of teaching materials and media applied in online / non-face-to-face learning. (4) In the learning device there is an evaluation instrument. In the evaluation process, there is an evaluation process and an evaluation of the results. Of course, the evaluation process applied during face-to-face meetings and evaluations applied in online/non-face-to-face learning will differ in indicators and method. Therefore, this research aims to develop learning tools in Learning and Learning Courses that are systematically designed based on online learning characteristics and student needs. The learning tools developed consist of RPS (semester learning plan), lecture contracts, teaching materials in the form of handouts, learning media and evaluation instruments. Developing learning model is very important to do in the era of the Covid-19 pandemic. So, the researchers consider that this study is very important. ADDIE model is highly recommended to be used in this research.

Methodology

The type of the research is research and development (R&D) by using the ADDIE model. The development model consists of 5 stages, namely an analysis, design, development, implementation, and evaluation. The sample of the research were 36 students of Biology study program at one public university in Sulawesi Barat. The 36 students were from two classes, namely Class B with 18 students and Class A with 18 students. The research instrument used was a validation questionnaire to test the feasibility of the product and evaluation questions to find out the effectiveness of the product that had been developed. The stages carried out in this research consist of several steps as in figure 1 below.

Figure 1. ADDIE stages



Analyzing, at this stage, there are several steps that have been done, including: (1) analyzing problems during online learning, (2) analyzing the characteristics and needs of students / learners, (3) analyzing the characteristics of learning and learning lecture materials, and (4) mapping the relatedness of material substance, media types, and evaluation instruments.

Designing, at this stage that is done is designing products that will be applied based on the results of analysis that has been done in the next stage.

Developing, there are several activities carried out at this stage, namely: (1) developing learning devices, (2) consulting with the teaching team related to the results of learning device development, (3) revising based on the results of consultation with the teaching team, (4) doing validation by three validators of material and media experts, this validation activity aims to find out the validity of the product developed and (5) make revisions based on improvement suggestions and ma sports of validators. To assess the feasibility of the product developed, the results of the validator assessment are adjusted to the following mortality level table.

Table 1. *Product validity level*

Mortality Rate (%)	Qualification	Information
81 – 100	Excellent	Very valid but needs minor revisions*
61 – 80	Good	Valid but needs minor revisions*
41 – 60	Enough	Quite valid and needs major revisions*
21 – 40	Less good	Less valid and needs major revision*
0 - 20	Very lacking	Invalid and needs major revision*

*Description = The concept of material must be 100% correct (Modified from Arikunto, 2009)

Implementing, the implementation activity is the implementation stage of a learning device that has been valid based on validation results by material and media expert validators. This stage aims to test the practicality and effectiveness of the learning tools developed. The categorization of practicality and effectiveness can be seen in table 2 and table 3 below.

Table 2. *Product practicality level*

Mortality Rate (%)	Qualification	Information
81 – 100	Excellent	Very practical but needs minor revisions.
61 – 80	Good	Practical but needs minor revisions
41 – 60	Enough	Quite practical and needs major revisions
21 – 40	Less good	Less practical and needs major revisions
0 - 20	Very lacking	Impractical and needs major revisions

Modified from Arikunto (2009)

Table 3. *The level of effectiveness of the product*

Mortality Rate (%)	Qualification	Information
81 – 100	Excellent	Very effective but needs small revisions
61 – 80	Good	Effective but needs minor revisions
41 – 60	Enough	Quite effective and needs major revisions
21 – 40	Less good	Less effective and needs major revisions
0 - 20	Very lacking	Ineffective and needs major revisions

Modified from Arikunto (2009)

Evaluating, the evaluation applied to this study is horizontal, so that every step / stage that is done, there will be an evaluation process to see the shortcomings / errors contained in each stage. The evaluation is important to look at what happened in every stage that was conducted in this study.

Ethical considerations

In this study, participation was voluntary. Additionally, our participants' data were concealed in order to keep the privacy of their identity such as the names, gender, etc. This was done in order to ensure ethical research practice and to protect participants' safety, privacy, and confidentiality.

Results and Discussion

In this study, our findings will be presented by following what we presented in our methodology part. Therefore, the results and discussions in this study are divided into several stages including analyzing, designing, developing, implementing, and evaluating. In every stage, we will present that will be discussed in the following.

The analysis stage

According to Putri and Amir (2018), a product can be said to be viable if it meets valid, practical, and effective criteria. Therefore, a structured initial analysis is needed to collect all the problems or obstacles found related to online learning. In the analyzing stage, there are several steps taken to analyze the learning device to be developed including the analysis of online learning problems, analysis of student needs, analysis of materials, media and evaluation instruments, and mapping the relatedness of material substances, media types, and evaluation instruments.

Table 4. *Learning device analysis*

Stages	Results of analysis
Analysis of online learning problems	Unavailability of learning devices that are suitable for distance learning / non-face-to-face. The existence of the covid pandemic makes some learning materials unable to adjust to online learning.

Table 4. *Learning device analysis (continued)*

	<p>There is no teaching material that can be used as the main source of learning of students</p> <p>Learning methods that do not vary due to lack of online learning preparation</p> <p>Some students are constrained by unstable networks that inhibit live online learning for example through zoom meetings.</p>
Analysis of student needs	<p>Characteristics of students are mostly passive looking for teaching materials / media that can be used as an alternative learning source or literature as a support for lectures,</p> <p>Students tend to prefer teaching materials provided directly by lecturers.</p>
Analysis of materials, media and evaluation instruments	<p>The characteristics of the material in mk learning and learning consist of 4, namely material that is factual, conceptual, procedural and metacognitive.</p> <p>Learning media used are learning videos, movies, journal articles and handouts</p> <p>The evaluation instrument applied will be adjusted to the type and technical assessment and substance of the material</p>
Mapping the relatedness of material substances, media types, and evaluation instruments	<p>This mapping aims to adjust between the characteristics of the material with the appropriate type of media and the evaluation instrument that can be applied. This is done so that the assignment methods given vary, improve problem-solving skills in students and add new references.</p>

Table 5. *Analysis of evaluation instruments*

Types of assessment of learning outcomes	Technical	Materials
Assessment of learning outcomes with traditional approaches	Standardized tests	-
	Teacher made test (teacher made test)	<p>Test essays on material</p> <p>1. The nature of learning</p> <p>2. The nature of learning</p> <p>3. Neuroscience learning</p> <p>In this material selected essay tests to find out the cognitive level of students</p>
Alternative assessment	Portfolio	-
	Rubric	-
	Journal of learning/learning journal	-
	A brief note about learning logs	<p>Learning log behaviorism</p> <p>Learning social cognitive log</p> <p>Learning log constructivism</p>

Table 5. *Continued...*

	Learning log of industrial revolution era 4.0
	Learning log learning problems
	In this material selected learning log because the learning source used in the form of film / video / novel related to the material to increase the understanding of students
Self assessment	-
Concept map	-
Focus group discussion	-
Investigation	Analysis of articles on classroom planning and management materials
	Learning design on SCL learning materials, HOTS-based learning, biology learning and learning

The design stage

The design stage is the stage of learning device design activities based on the results of analysis that has been done in the previous stage, namely the analyze stage. According to Rahma (2012), the proficiency and creativity of educators in designing learning tools can optimize the ability of learning indicators and educational goals. At this stage there are several activities carried out starting from the first stage of RPS design and lecture contracts. The format used in the creation of RPS and lecture contracts uses forms that have been predetermined by the faculty.

The RPS section consists of identity, learning achievement, short description of courses, study materials / subject matter, reference list, name of powerful lecturers, prerequisite courses, lecture meetings, sub-CPMK, form and method of learning, time estimation, student learning experience, and assessment column consisting of assessment criteria and forms, assessment indicators, and assessment weights. While in the lecture contract contains the identity of the course; description of the course; CPMK; sub CMPK; learning strategies; materials and learning structures in which contained meeting schedules, subjects, sub-subjects and sources of reference; references; assessment system; order, others, and attachments. The second stage is to design learning media and evaluation instruments that are in accordance with material characteristics. The results of learning media design can be seen in table 6 below.

Table 6. *Design of materials, media and evaluation instruments*

Material	Media		Evaluation instruments
	Kind	Heading	
The truth of learning and learning	Handout	The truth of learning and learning	Essays
Theory of learning behaviorism	Handout	Theory of learning behaviorism	Form learning log
	Novel	Totto Chan Little Girl in the Window	
Social cognitive learning theory	Handout	Theory of cognitive social learning	Form learning log
	Film	Front of The Class	
Theory of learning constructivism	Handout	Theory of learning constructivism	Form learning log
	Film	Freedom Writers	
Neuroscience learning	Video	What is the difference between the right and left brain? How do nerve cells work?	Essays
Industrial Revolution 4.0 in learning	Video	Industrial Revolution 1.0-4.0	Form learning log
SCL Learning	-	-	Learning plan form
HOTS-based learning	-	-	Learning plan form
Classroom planning and management	Journal article		Journal critical analysis form
Learning problems	Learning video	Learning difficulties	Form learning log
	Film	Pencil bridge	
Study and study biology	-	-	Learning plan form

The learning media used in this study are divided into two types, namely (1) learning media compiled by researchers themselves, such as handouts and learning videos on learning problem materials and (2) media obtained from internet literature, such as films, journal articles and other learning videos. The design on the handout uses the canva application that can be accessed online on the www.canva.com website. to help design cover templates while for learning video creation using Wonder share Filmora 9. There are several educational-themed films that have been used for the making of learning videos, including rainbow warriors, in the east of the sun, freedom writers, front of the class, pencil bridges, Ananda's dream of reaching the universe, wonderful life, the great debater, jungle sokola, stand and deliver, how funny this country is, dahlan shoes, the dreamer, the land of 5 towers, and several other relevant videos. Early prototypes on handouts and learning videos can be seen in the following image.

Figure 2. *The handout covers*

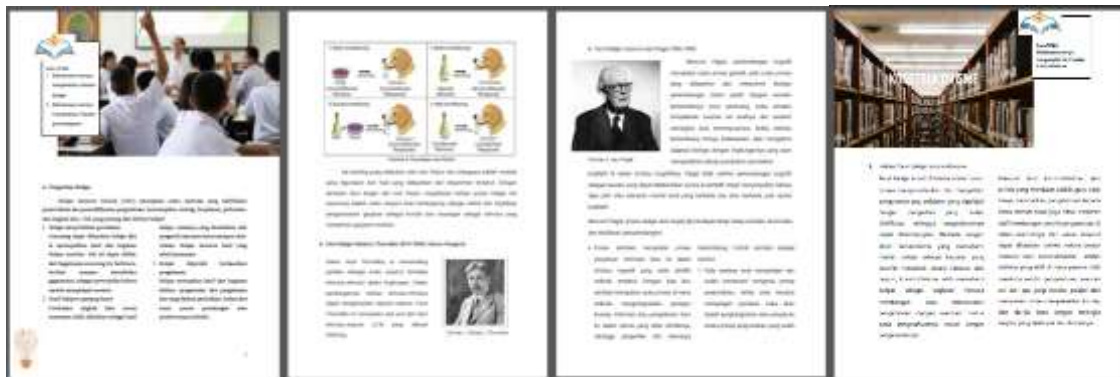


A

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Figure 2. a. handout cover of the nature of learning and learning; b. cover handout theory learning behaviorism; c. cover of social cognitive learning theory; d. the cover of constructivism learning theory; e. the contents of the handout theory of learning constructivism; f. the contents of the handout theory of learning behaviorism; g. the content of handout theory of social cognitive learning; h. fill the handout of learning and learning; i. a learning video titled learning difficulties.

The development stage

At this stage, the initial prototype that has been designed in the previous stage is then validated by an expert validator of materials and media to determine the validity of the product that has been developed. Development activities on learning devices are intended to get input on the development carried out to improve or revise the deficiencies contained in all components of the learning device and in its application (Listyawati, 2012). There are several suggestions and inputs from validators, including: (1) from the aspect of material feasibility, the examples presented need to be adjusted to the conditions in the surrounding environment and support student understanding. (2) In terms of language eligibility, it is best to use a simpler language and adjusted to the level of cognitive understanding of early semester students. (3) It is necessary to pay attention to the allocation of time for learning log assignments whether it can be completed in accordance with the predetermined duration of time, so that students can collect tasks in a timely manner. More complete suggestions and feedback can be seen in table 7. As for the results of product feasibility assessments from the three validators, namely 86.25%; 95% and 90. The average validity value obtained by him, based on validation results obtained is concluded if the learning device that has been developed is very feasible to use with small revisions. Similar research has been conducted by Zagoto and Dakhi (2018) that on the development of mathematical learning tools based on valid scientific approaches used to improve the learning ability of students of grade XI SMAN.

Table 7. *Validators' suggestions on learning device*

Prototype	Validators' suggestions
RPS	Add more CPMK to sub CPMK 2
	CPMK-3 needs to be reviewed whether it can be implemented in online learning, otherwise it should not be written down.
	In the short description column of the course needs to be included about learning Higher Order Thinking Skill (HOTS) as a logical consequence of the development of the situation in the era of the industrial revolution 4.0
	In the study material / learning material column, the word HOTS added higher order thinking skills.
	In the reference list column, it is necessary to add a handout developed, as well as other supporting articles
	All terms in a foreign language are written/italic printed

Table 7. Continued...

	In the sub-CPMK 2 column of meeting 2, add the sentences of obstacles that occur that occur in the lecture contract and introduction to learning and learning.
	In the student's learning experience column at the second meeting, add one more point that provides common examples of learning barriers (individual assignments).
	In the criteria column and meeting assessment form 2, add the results of the individual task assessment
	In the indicator column of meeting assessment 2 add clarity in making individual tasks about examples of learning barriers
	In the student experience column, all films or videos given to students are written the title.
College contract	In the section of the reference source column, the literature is written in full (each meeting), just write the order number in accordance with the order in the reference and the page.
	In the order section, make detailed details of the rules, including how the agreement if students experience network barriers, what if they cannot follow virtual zoom meetings, and others
Handout	Each page, please be numbered
	In the fact handout of learning, A person who stops learning is an elderly person, even though he is still a teenager. A person who never stops learning will forever be a young man.- <i>Henry Ford</i> – These quotes should be replaced because they are not in accordance with the concept of lifelong learning.
	In the handout of behaviorism theory, providing reinforcement (maybe positive reinforcement or negative reinforcement), or punishment
	In the handout of behaviorism theory, there needs to be an independent task, students are asked to identify the advantages and disadvantages / limitations of behaviorism theory in learning, as well as ways / efforts to minimize the effects of these shortcomings / limitations (asked to include a list of references in the answer sheet)
	In the handout of constructivism theory, the steps of learning according to the theory of learning constructivism
	In the handout of constructivism theory, there needs to be an independent task, students are asked to identify the advantages and disadvantages / limitations of constructivism theory in learning, as well as ways / efforts to minimize the effects of these shortcomings / limitations (asked to include a list of references in the answer sheet)
	In the handout of social cognitive theory, the level of learning steps according to social cognitive learning theory
	In the handout of social cognitive theory, there needs to be an independent task, students are asked to identify the advantages

Table 7. *Continued...*

	and disadvantages / limitations of social cognitive theory in learning, as well as ways / efforts to minimize the effects of these shortcomings / limitations (asked to include a list of references in the answer sheet)
"Learning Difficulties" Video	At the end of the video, the appropriate conclusions are appeared for relaxation. The word "normal" in the underachiever explanation should be replaced with the word "average."
Evaluation instruments	In the material of the nature of learning, for the problem no. 5 point a, "give an example of an overview to find out the achievement of each of these realms" In the learning log instrument, the question column after reading literature / watching a movie, the word "explain" is added "put forward by deciphering it"

The implementation stage

Implementation of learning devices that have been developed is carried out for one semester to determine the practicality of use and effectiveness of the final prototype produced. According to Kurniawan (2016), the practicality of learning devices can be analyzed through the implementation of RPS during the learning process, student activities, and obstacles during the learning process as measured through observation. The results of the analysis on the implementation of RPS in class A 88% and class B 100%, so that the average implementation of RPS is 94%. During the learning process, students do not find any significant obstacles or obstacles related to the use of learning devices used. Based on the results of the analysis, it can be concluded that mk learning and learning tools are very practical to apply to FKIP students of West Sulawesi University.

As for the effectiveness of the learning device, based on the results of final assessments in both classes that were used as research subjects obtained on average in class A which is 77%, there is 1 student who rarely does the task. While in class B obtained the average final value is 83.9%. The average for all study subjects was 80.45%. Therefore, it was concluded that the learning tools in MK Learning and Learning are effectively used at FKIP University of West Sulawesi. Similarly, research conducted by Sulistyani and Retnawati (2015) that the learning device builds space with a problem-based-learning approach that has been developed effectively used in junior high school which is seen based on the results of KD achievement tests, critical thinking and student attitudes. Indicators to state the effectiveness of a product can be seen from several components, including (1) student learning outcomes; (2) student activities; and (3) students' abilities in some skills, such as creative thinking, being able to solve problems, and others (Rahma, 2012). According to Akhlis and Dewi (2014) in their research related to the development of cultural deviance solution-oriented learning devices that learning devices are developed as well as possible, not only produce graduates with high cognitive abilities but can also follow the development of information and technology, creative, independent and responsible.

The evaluation stage

Evaluation is a data collection activity to measure the extent to which the effectiveness of learning activities and learning goals are achieved. In this study, two types of evaluation were conducted, namely process evaluation and evaluation of results. Evaluation of the process is carried out from the problem analysis stage to the implementation stage. At each stage, an evaluation is carried out to find out what aspects need to be improved, improved or maintained for the improvement of all stages of research by discussing with the teaching team. The evaluation of results is carried out with two stages as well, namely formative evaluation and summative evaluation. Formative evaluation is given to students at each meeting with varied assessment work, while the summative evaluation is carried out twice, namely at mid test meetings and final tests. According to Wu, Huang, Han, & Zhang (2022) without evaluation researchers cannot determine whether a problem has been solved satisfactorily or not. The evaluation stage is required in each phase and is carried out repeatedly until the desired problem solving is achieved (Amir, 2018).

Conclusion

Through the research and development by using the ADDIE model including analyzing, designing, developing, implementing, and evaluating, the development of online learning and learning courses during the Covid-19 Pandemic, the learning devices have been produced, including lecture contracts, RPS, teaching materials and teaching media, and instrument evaluation which are valid, practical, and effective.

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