Research Article

Developing Computer Course Models Based on Learning Management System for Early Children Education Teachers

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Abstract.

Course and training institutions as a nonformal education unit organized for people who need knowledge, skills, life skills, and attitudes for self-development, professional development, work, independent business, and/or continuing education to a higher level. Currently, the world is faced with the phenomenon of digital disruption, which is a situation shown by the movement of the industrial world or job competition that is no longer linear. In the field of courses and training, the current era of disruption has also led to online course and training services that can be accessed via the service provider's web/page. These service providers are not in the form of educational units, but several experts in their fields have joined forces with several experts in information and communication technology to create courses and training services that can be accessed through electronic devices such as computers, laptops, and communication devices.

One of the development of courses and training in the field of information and communication technology is based on *learning management system* (LMS)—a web-based application system that allows instructors and/or students to share material, submit, and return assignments, and communicate online.

Results of research and development of computer-based course models and training that have been tested shows that the level of practicality of this model is very good according to the instructor, course, and training organizers. Results of course learning and computer-based training can improve the skills of early childhood education teachers in the office application computer course program.

Keywords: non-formal education, courses and training, learning management system, early childhood education teachers

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1. Preliminary

Non-formal education is provided for members of the community who need services, education that functions as a substitute, enhancement, and / or complement to formal education in order to support lifelong education. One of the non-formal education is skills education and job training. The non-formal education unit consists of course institutions, training institutions. Courses and training are held for people who need knowledge, skills, life skills, and attitudes to develop themselves, develop professions, work, work independently, and / or continue their education to a higher level.

("Course," 2019) Courses and training are a teaching and learning activity as well school. The difference is that courses and trainings are usually held in a short period of time and only learn one Skills certain. Many courses and trainings are organized by communities, institutions, organizations independently in order to serve people who, for some reason, are less fortunate in life so they do not have skills, are unemployed or work in an unfavorable position.

The world is entering the digital revolution or fourth industrialization. The use of the Internet of Things (IoT), big data, cloud databases, blockchain, and others will change the pattern of human life. Students, for example, can easily find information via the internet to complete school assignments. In fact, for certain conditions such as in 3T areas (frontier, outermost, disadvantaged), devices can replace parents and teachers. In areas like this, most parents are unable to guide their children to study. Even good teachers are rarely found. In the future, teaching students could be a function of digital companies too. Apart from school, children can study anywhere. currently the world is faced with the phenomenon of digital disruption, which is a situation shown by the movement of the industrial world or job competition that is no longer linear. Change occurs very quickly and fundamentally, in the field of education, the era of disruption has encouraged and even "forced" the digitalization of the education system.

Courses and training in the current era of disruption have also led to online course and training services that can be accessed through the service provider's web / page. These service providers are not in the form of educational units, but several experts in their fields have joined forces with several experts in information and communication technology to create courses and training services that can be accessed through electronic devices such as computers, laptops and communication devices.

The results of a preliminary study by researchers from February to March 2019 in South Sulawesi Province through a survey method using an online google form based instrument / questionnaire, related to online learning organized by course and training institutions, data was obtained, only 15% of course and training institutions had implementing online learning and 85% still provide conventional course and training services, both in terms of services and in the learning process. Researchers also conducted observations and direct interviews related to the implementation of courses and trainingbased on Learning Management System. Based on the results of observations and interviews, there is no course and training institution that has organized courses and training based on Learning Management System. ThingThis is due to several problems faced by course and training institutions, namely (1) no internet network, (2) teachers do not have electronic devices to access online course learning, (3) costs used to provide

devices and networks expensive internet, and (4) educators (instructors) who do not yet understand the main network-based learning Learning Management System.

2. Research purposes

Knowing the level of validity, the level of practicality and the level of effectiveness of the script and the product model development computer courses based on the Learning Management System application in support of improvement competence of early childhood education teachers in the field of computer office applications.

3. Research design

The approach and type of research to be used is research and development using the concept of product development from ADDIE According to Branch (2009: 2) which consists of 5 stages, namely (1) analysis, (2) design, (3) development, (4) implementation, and (5) evalution

4. Research Scope

The scope of this study is to determine the level of validation, the level of practicality and the level of effectiveness of the course-based learning and training model *Learning Management System*. The theories used are as follows; 1) Constructivism, theory pconstructivist learning (Riyanto, 2012), said that an important principle in educational psychology is that teachers can not just provide knowledge to students, but students must build their own knowledge in their minds. and 2) Progressivism which states that humans have the ability to develop and enhance their environment by applying the intelligence they have (Gerald Lee Gutek, 2010), 3) *Learning Management Systems* (LMS) is a web-based system that allows instructors and / or students to share material, submit and return assignments, and communicate online (Lonn and Teasley, 2009)

5. Research Instruments

The instruments used in this study were 3 kinds as follows:

1. Instrument validation by linguists, material experts and media experts. This process is carried out to test the validity level of the model script and the compiled model product.
2. Instrument practicality model by teachers and instructors. This process is carried out to test the level of practicality in implementing the learning model.
3. Instrument model effectiveness by the results of the pre-test learning assessment before applying the learning model and the posttest results after following the learning model.

6. Data collection and analysis

The data collection technique was carried out in accordance with the stages in the ADDIE model development procedure as described below.

1. At the analysis stage, the data collection technique used was to use a google form-based questionnaire, then an unstructured interview was conducted, and direct observation was made to the course and training institution.
2. At the design preparation stage, the data collection techniques used werediscussion, focus group discussion.
3. At the development stage The data collection technique used was a questionnaire which will be filled in by media expert validators, material expert validators, linguist validators.
4. At the implementation stage The data collection technique used was a questionnaire which will be filled by instructors and teachers.
5. At the evaluation stage The data collection technique used was a questionnairewhich will be filled by course and training teachers related to the evaluation of the implementation of learning by the instructor. And pretest and posttest instruments to measure the effectiveness of the modellearning that has been given to the teacher.

The data analysis technique was carried out by means of qualitative data analysis and quantitative data analysis for each stage in the ADDIE procedure as described below.

1. At the analysis stage the data analysis technique used is Qualitative and quantitative. preliminary study instruments that have been filled in by the respondents; 1)

course and training providers, related to the implementation of courses and training that have been implemented, both online and offline. 2). Instructors regarding the use of the application*Learning Management System* in learning.

2. At the design compilation stage, the data analysis technique used isqualitative. Model and product designwhat has been written by the researcher is then assessed by the supervisor, based on input or suggestions then corrected, and produces data in the form of qualitative data.

3. At the development stagethe data analysis technique used is Qualitative and quantitative. validation instruments that have been provided and have been filled in by media expert validators, material expert validators and language validators are then analyzed using the Microsoft Excel application (quantitative data) and input or suggestions are analyzed and produce data in the form of qualitative data.

4. At the implementation stage the data analysis technique used is Qualitative and quantitative. The data collection instrument filled in by the Instructor on the aspects of use Course model and training based on the Google classroom Learning Management System application, the results of data analysis in the form of quantitative data and qualitative data.

5. At the evaluation stage the data analysis technique used is Qualitative and quantitative.The data collection instrument filled in by the teacher on the aspects of use and utilization Course model and training based on google classroom Learning Management System application as a medium of learning. As well as the results of the teacher's pretest and posttest after following the learning model. The results of data analysis were in the form of quantitative data and qualitative data.

7. Research Findings

a. Result Expert Validation Test

Validation is carried out by five experts/practitioners which is an activity of evaluating experts on the learning model products that have been made. Experts are asked to validate all model products that have been made in the previous stage. Suggestions from experts / experts / practitioners are used as a reference in revising the product model.

The categorization of model validity is quoted from Sugiyono (2017: 165) as follows:

Validity Categorization Table

Very Invalid (STV) if the score : $0 \leq \overline{x} \leq 1$

Invalid (TV) if score : $1 \leq \overline{x} \leq 2$

Sufficiently Valid (CV) if the score : $2 \leq \overline{x} \leq 3$

Valid (V) if the score : $3 \leq \overline{x} \leq 4$

Very Valid (SV) if the score : $4 \leq \overline{x} \leq 5$

Table 1: Average Results of Expert Validation for Model Books and Curriculum Materials.

Assessment Aspects	(Ai)	$\overline{x}$	Info
Model Book Components	4,2	4.09	SV
Curriculum	4,1	4.09	SV
Content of the Material	4,2	4.09	SV
Learning	4,3	4.09	SV
Interaction and Feedback	3,7	4.09	V
Total Value	20.5		
Average	4.09		SV

The total average value of the validity of the model book and curriculum according to the material expert validator for all aspects of the assessment was obtained = 4.09 based on the validity criteria mentioned above, this value is included in the Very Valid (SV) category, which is at $4 \leq \overline{xx} \leq 5$. If reviewed from all aspects of this format, the model book and curriculum model of courses and computer training for LMS-based office applications in supporting the human resources of teachers early childhood education programs those who are skilled are declared to meet the validity criteria.

Table 2: Average Validation Results of Media Experts in Model Books and Curriculum.

Assessment Aspects	(Ai)	$\overline{x}$	Info
Graphic Feasibility Components	3.8	3.65	V
Book Cover Design	3,4	3.65	V
Book Cover Typography - The letters used are attractive and easy to read	3,9	3.65	V
Book Cover Illustration - Reflects the contents of the book	3,3	3.65	V
Book Contents Design - Book Contents Layout	3,6	3.65	V
Book Content Design - Typography of Book Contents	3,9	3.65	V
Total Value	21.9		
Average	3.65		V

The average value of the total validity of the model book and curriculum according to the media expert validator for all aspects of the assessment was obtained = 3.65 based

on the validity criteria mentioned above, this value is included in the Valid (V) category, which is at $3 \leq \overline{xx} \leq 4$. If viewed from all aspects of this format, the model book and curriculum model courses and computer training for LMS-based office applications in supporting teacher human resources early childhood education programs those who are skilled are declared to meet the validity criteria.

Table 3: Average Media Expert Validation Results in the Google Classroom LMS Application.

Assessment Aspects	(Ai)	$\overline{x}$	Info
Application Eligibility Component	3,7	3.85	V
Software Engineering Aspects	3,9	3.85	V
Visual Communication Aspects	3,9	3.85	V
LMS Application Aspect - Google Classroom	3,9	3.85	V
Total Value	15.4		
Average	3.85		V

The total average value of the validity of the LMS Google Classroom application according to the media expert validator for all aspects of the assessment obtained = 3.85 based on the validity criteria mentioned above, this value is included in the Valid (V) category, which is at $3 \leq \overline{xx} \leq 4$. When viewed from all aspects of this format, the LMS Google Classroom application in the model and curriculum of the course model and computer training for LMS-based office applications in supporting teacher human resources early childhood education programs those who are skilled are declared to meet the validity criteria.

Table 4: Average Material Expert Validation Results in the Instructor's Manual.

No.	Assessment Aspects	(Ai)	$\overline{x}$	Info
1	Learning Based Learning Management System (LMS)	4.00	4.00	SV
2	Use of LMS Applications in Courses and Training	4.00	4.00	SV
3	Interface (LMS Application Display)	4.00	4.00	SV
4	Graphic Design and Audio Visual	4.00	4.00	SV
Total Value	16.00			
Average	4.00		SV	

For the total average value of the validity of the Guidebook for Instructors according to the material expert validator for all aspects of the assessment obtained = 4.00 based on the validity criteria mentioned above, this value is included in the Very Valid (SV) category, which is at $4 \leq \overline{xx} \leq 5$. If In terms of all aspects of this format, the Instructor's Manual is declared to meet the validity criteria.

For the total average value of validity for aspects Language in Model Books, Curriculum and Handbooks All aspects of the assessment were obtained = 4.94 based on the

Table 5: Average Linguist Validation Results in Model Books, Curriculum and Manuals.

No.	Assessment Aspects	(Ai)	Info
1	Language in Model Book	4.90	SV
2	Language in the Model Curriculum	4.90	SV
3	Language in the Guidebook for LKP Managers	4.95	SV
4	Languages of the Instructor's Manual	4.95	SV
5	Languages of the Teacher's Manual	5.0	SV
	Total Value	24.70	
	Average	4.94	SV

validity criteria mentioned above, this value is included in the Very Valid (SV) category, which is at $4 \leq \overline{xx} \leq 5$. If viewed from all aspects of this format, then for the Language aspects of the Model Book, Curriculum and the Guidebook is declared to meet the validity criteria.

b. Model Practicality Test Results

The practicality test in this model trial uses two instruments, namely the practicality questionnaire of each material provided by the instructor which is filled in by the teacher regarding the practicality of the course learning model and computer training for LMS-based office applications (google classroom) taught by the instructor, and a practicality questionnaire for each material taught filled by instructors related to the management of course learning models and computer training for LMS-based office applications (google classroom) in supporting teacher human resources early childhood education programsthe skilled. CriteriaAssessment by the teacher by providing a value on the instrument with the following information: 4= Strongly Agree, 3 = Agree, 2 = Disagree, and 1 = Disagree. The results of filling out this practicality questionnaire are described as follows:

Table 6

P1	M1	%	M2	%	M3	%	M4	%	M5	%	M6	%	M7	%	M8	%	Average
Strongly agree	16	53.33	14	46.67	12	40.00	13	43.33	20	66.67	17	56.67	17	56.67	16	53.33	52.08
Agree	14	46.67	15	50.00	15	50.00	17	56.67	10	33.33	12	40.00	13	43.33	13	43.33	45.42
Disagree less	0	0.00	1	3.33	2	6.67	0	0.00	0	0.00	1	3.33	0	0.00	1	3.33	2.08
Disagree	0	0.00	0	0.00	1	3.33	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.42
	30		30		30		30		30		30		30		30		

The results of filling out the teacher's response questionnaire from the entire material for the first question, obtained an average of 52.08% of teachers said Strongly Agree,

45.42% of teachers said Agree, 2.08% of teachers said Disagree and 0.42% of teachers said No Agree.

The results of filling out the teacher response questionnaire from the entire material for the second question, obtained an average of 62.92% of teachers said Strongly Agree, 34.58% of teachers said Agree, 2.50% of teachers said Disagree and 0% of teachers said Disagree.

The results of filling out the teacher's response questionnaire from the entire material for the third question, obtained an average data of 49.17% of teachers said Strongly Agree, 45.83% of teachers said Agree, 4.58% of teachers said Disagree and 0.42% of teachers said No Agree.

The results of filling out the teacher's response questionnaire from the entire material for the fourth question, obtained an average data of 54.17% of teachers said Strongly Agree, 42.50% of teachers said Agree, 2.08% of teachers said Disagree and 1.25% of teachers said No Agree.

The results of filling out the teacher response questionnaire from the entire material for the fifth question, obtained an average of 60.00% of the teachers said Strongly Agree, 37.92% of the teachers said Agree, 1.67% of the teachers said Disagree and 0, 42% of the teachers said No Agree.

The results of filling out the teacher's response questionnaire from the entire material for the sixth question, obtained an average data of 51.67% of teachers said Strongly Agree, 44.17% of teachers said Agree, 4.17% of teachers said Disagreed and 0% of Teachers said Disagree.

The results of filling out the teacher's response questionnaire from the entire material for the seventh question, obtained an average of 52.08% of teachers said Strongly Agree, 43.33% of teachers said Agree, 4.58% of teachers said Disagree and 0% of teachers said Disagree.

The results of filling out the teacher's response questionnaire from the entire material for the eighth question, obtained data on average 57.08% of teachers said Strongly Agree, 40.42% of teachers said Agree, 2.50% of teachers said Disagreed and 0% of teachers said Disagree.

The results of filling out the teacher's response questionnaire from the entire material for the ninth question, obtained an average data of 58.75% of teachers said Strongly Agree, 39.58% of teachers said Agree, 1.67% of teachers said Disagreed and 0% of teachers said Disagree.

The results of filling out the teacher response questionnaire from the entire material for the tenth question, obtained an average data of 50.42% of teachers said Strongly Agree, 45.42% of teachers said Agree, 3.33% of teachers said Disagree and 0.83% of teachers said No Agree.

c. Effective Test Resultsitas Model

Effectiveness test in this study taking data from the design *One-Group Pretest-Posttest Design*. Data collection on the effectiveness of this result was measured using the results of the pretest which was carried out before being given treatment and posttest which was carried out after being given treatment for each learning series. Thus the treatment results can be found to be more accurate. To eliminate bias from the research results, the pretest and posttest will be carried out for four sessions of learning material. One-Group Pretest-Posttest Design Scheme.

Research Hypothesis:

Ho : There is no average difference between the pretest and posttest learning outcomes, which means there is no influence of the LMS-based course and training model in improving learning outcomes and computer skills in office applications for teachers early childhood education programs.

Ha : There is an average difference between the pretest and posttest learning outcomes, which means that there is an effect of the LMS-based course and training model in improving learning outcomes and computer skills in office applications for teachers. early childhood education programs.

The basis for decision making in the Paired Sample T Test, namely:

1. If the significance value (2-tailed) <0.05 then Ho is rejected and Ha is accepted.
2. If the significance value (2-tailed)> 0.05 then Ho is accepted and Ha is rejected.

Table 7

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Mean Error	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre_Test_Sesi_ - Post_Test_Sesi	-34.66667	53.54555	9,77604	-54,66091	-14.67243	-3,546	29	, 001

The results of the Paired Sample T Test for session 1 showed a significance value (2-tailed) = 0.001. This indicates that the significance value (2-tailed) <0.05, so that Ho

is rejected and Ha is accepted. This means that there is an average difference between the learning outcomes of the Pre test and Post test session 1, and this means that there is an effect of the LMS-based course and training model in improving learning outcomes and office application computer skills for session 1 teachers.

TABLE 8

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Mean Error	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre Test Session 2 - Post Test Session 2	-81.333333	86.61183	15.81308	-113.67472	-48.99194	-5,143	29	, 000

The results of the Paired Sample T Test for session 2 showed a significance value (2-tailed) = 0.000. This indicates that the significance value (2-tailed) <0.05, so that Ho is rejected and Ha is accepted. This means that there is an average difference between the pre-test and post-test learning outcomes in session 2, and this means that there is an effect of the LMS-based course and training model in improving learning outcomes and computer skills in office applications for teachers in session 2.

8. Discussion

Based on the ADDIE model development procedure used in this research, in the discussion section of the results of this study, three things will be stated related to the development of the LMS-based Office Application Computer Course and Training Model in supporting the human resource of Skilled Early Childhood Education Teachers. will discuss several things as follows, namely knowing the level of model validity, knowing the level of practicality and knowing the level of model effectiveness:

Some Constraints and specific findings in the process of implementing the trial in this study are as follows:

1). The level of validity for all aspects of the Model Book, Curriculum and Handbook, based on the validity criteria, this value is included in the Very Valid (SV) category, which is at $4 \leq \overline{x} \leq 5$. And it is declared that it meets the validity criteria.

2). The level of practicality for all Questionnaire teacher responses and instructor responses from the entire material for all the questions in the questionnaire, it was found

that the average teacher data said Strongly Agree, and Agree, only a few teachers said they disagreed and disagreed.

3). Effectiveness level based on The results of the Paired Sample T Test for all learning sessions, obtained a significance value (2-tailed) = 0.000. This indicates that the significance value (2-tailed) <0.05, so that Ho is rejected and Ha is accepted. This means that there is an average difference between the pretest and posttest learning outcomes for all learning sessions, and this means that there is an effect of the LMS-based course and training model in improving learning outcomes and computer skills in office applications for teachers.

In addition to these findings, researchers also saw phenomena in this learning process, namely:

1. The implementation of this course and training learning model will run well, if it is supported by all parties, starting from instructors, administrators, teachers. Support here starts from the learning preparation process, the learning implementation process, the evaluation process
2. Organizers' activities start from managing classes, interacting with teachers, interacting with instructors in desperate need of skills related to information and communication technology, from using laptops, cellphones, and internet connections.

9. Conclusion

The conclusions that can be drawn from this research and development are as follows:

The level of validity for all aspects, starting from material aspects, media aspects and language aspects in model book products, curricula, manuals for LKP managers, manuals for instructors, and manuals for teachers meet the validity criteria. The level of practicality of the model by the average instructor agrees to strongly agree starting from the Aspect of Clarity of Instructions for Use of the Learning Implementation Plan in the LMS-based Course and Training Model, Aspects of Competency Achievement and Learning Objectives of LMS-based Course and Training Models, Aspects of Teacher Response when Learning in the Course Model and LMS-based training, an aspect of instructor difficulty in implementing the LMS-based course and training model. The level of effectiveness of the model from the four learning sessions given,early childhood education programs for all learning sessions.

Some of the limitations in this study range from the model product manuscript, which consists of a model book, a curriculum, a guide for managers, a guide for instructors and

a guide for teachers, which are still traditional text and not many supporting pictures of the text. Of course, this limitation will be refined at a later stage. Furthermore, the limitation of this study is that the course and training program made in the trial process only consists of one type of course and training, namely the office application computer program. Of course this model can not only be used by certain courses and training, but can be applied by all non-formal education units, ranging from course and training institutions, community learning activity centers.

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