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The Quality of Instructional Design Made by Educators of Vocational Electronic in Vocational High School

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Abstract
This study aims to know: (1) how the quality of instructional design made by educators of vocational electronic in Vocational High School in Makasar Municipal is, (2) one the consistency of instructional design components in the learning process. The research method used in this study are survey, observation and documentation, and also analysis using content analysis approach on the draft of instructional design made by educators of vocational electronic used in odd semester of school year 2016-2017 of Vocational High School in Makassar. The results of the study on the quality of instructional design component are: (1) the learning objective, content description on learning materials, and the choose of learning activities or strategies are in good category, (2) the use of learning sources/ media, the use of assessment/ evaluation, and giving feedback are in good enough category. The consistency of instructional design component toward other components still has double interpretation especially on the performance of learning objectives. Type of evaluation used to achieve the learning outcome is not relevant with the competence written in the learning objective. The conclusion of the study on the instructional design component made by educators of vocational electronics in Vocational High School of Makassar shows that there is inconsistency between the component of instructional design and the learning process, however the instructional design components made by the educators are still worth to be used and can be developed to fulfill the competence of professional educators of Vocational High School In Makassar.

Keywords: Instructional design, Vocational Educators, Vocational High School

INTRODUCTION

Learning is an interactional process between educators, learners and learning sources which is especially designed for learning process. Learning can also be done without the attendance of educators by utilizing learning sources which have been designed to achieve the learning objectives. The function of learning objectives has normative meaning and can be formed and has to be achieved in the learning process. Therefore, the instructional design components made by educators are set as indicators to know the quality of learning process, especially vocational learning of electronics in Vocational High School in Makassar.

Electronical education depends on the advancement of electronics equipments made by industry, because of the advancement of science and technology so that certain work occurs and demand certain skill and forms learning in form of certain lifelong learning skill in every learner.

The role of electronics equipments as field of study demands the use of advance technology, production tools. One of developing industry nowadays is microelectronics, robotics, and computer plus software, and also telecommunication which needs to be noticed by education and to be integrated in instructional design, especially in Vocational High School which implements learning for skill/competence of learners. This means, the function of school is to educate the learners by developing the vocational skill in form of hard skills and to form learners' attitude which are dignified, dissolute, and gentlemanlike in form of soft skill. This condition urges the need of learning process which does not abandon core values existing inside the school.

Instructional design as standard of process stated in curriculum 2013 states that: (1) instructional design involves syllabus and Lesson Plan, (2) each educator has to design syllabus and lesson plan by him/her self as reference in the learning process, learning assessment, and learning control[4]. This shows that instructional design made by educators is the main and basic learning process quality component to be done by educators. Nowadays, there are Lesson Plans available online. However, not all of them can be used because those Lesson Plans were not made based on need analysis of learning, especially entry behavior. The use of Lesson Plan from online network is still commonly used by not noticing the specific characteristic of the school and learners. Therefore, lesson plan made by vocational electronics teachers made based on standard of process in form of instructional design as the main reference to improve the quality of learning process and learning achievement. If the quality of instructional designs in form of syllabus and lesson plan made by vocational electronics educators are good, thus learning process and learning achievement will also be good.

Based on preliminary study and from researcher's experiences in supervising Electronics Department of vocational high school in Makassar, it is knows that the quality of instructional designs made by teachers in form of syllabus and Lesson Plan are still poor, because: (1) most of the teachers believe and act as if the syllabus and Lesson Plan are only for administrative purposes, since syllabus and Lesson Plan are only for school documentations and are needed if only the supervisors of school is come, (2) educators tend to make syllabus and lesson plan by copying from other educators' syllabus retrieved from Internet, so that the result of learning need analysis is not appropriate with the real situation in the classroom, (3) teachers do not use the syllabus and Lesson Plan as reference in learning process in the classroom, (4)

teachers believe that learning process in the classroom has been daily routine, (5) the learners' ability in questioning in learning process is still very low, (6) educators give very simple feedback in learning process.

The result of preliminary study above shows that educators' understanding on instructional design is very poor so that same understanding among educators is needed in making instructional design such as: (1) writing syllabus and lesson plan with good quality in every component of syllabus and lesson plan formed precisely based on precise and comprehensive understanding, (2) using the syllabus as the basis in writing lesson plan so that there is correlation among the components in the content of syllabus and lesson plan, (3) syllabus and lesson plan made by educators prioritize focusing on the students (Student Centered Learning). Those are needed by educators in their effort of improving the quality of learning process and learning achievement in vocational high school in Makassar.

Based on the descriptions above, thus generally the problems in instructional design made by educators of vocational electronics of vocational high school in Makassar can be explained as follows: (1) how the quality of instructional design made by educators is, (2) how the consistency among the components of instructional design in learning process. Both of those general problems can be classified into specific problems in this study which are: (1) most of educators of vocational electronics syllabus and lesson plan have not met the standard of process based on the demand of curriculum 2013, (2) standard of competence and indicators written in some of the lesson plans are not appropriate with standard of competence formed in the syllabus, (3) time allotment in the lesson plan is not in accordance with what is written in the syllabus, (4) most of the learning objectives has not consistently and wholly in reference to; audience, behavior, and condition, and degree (ABCD), and (5) most of the learning objectives do not in accordance with the assessment, so that the quality of instructional design is poor.

LITERATURE REVIEW

Vocational education majoring in electronics becomes one of study program in vocational high school in Makassar. Vocational education is an education which prepares its students to work in certain field of study [9]; hereby education in vocational high school is able to prepare its students with any technical competences (vocation). The students' skill, ability, attitude, working habit, and appreciations needed to face work life [14],[10],[15]. Vocational education has specific characteristic to made the learners are able to work or fill in the work vacancy in work life and industry based on their field of study and vocational program.

Based on some reviews on previous studies regarding the implementation of curriculum 2013, it is known that there are some problems, such as: (1) the materials in the curriculum are too package because they have large scope of learning materials and has high level of difficulty for the students seen from the development of learners, (2) the presented curriculum has not fully based on the competence which is appropriate with the function and objectives of national education, (3) competences in instructional design has not holistically visualized main competences (attitude, knowledge and skill), (4) standard used in assessment has not been able to assess competences (process and result) and has not been documented properly each component of the instructional design used by educators of vocational high school in Makassar.

In researcher's point of view, not all explanations above are fully right especially regarding instructional design made by educators of electronics department in vocational high school. This can be explained that: (1) vocational school, competence is seen as integrating specific cognitive and technical skill in group of vocational program, (2) component of instructional design needs to be seen as effort of organizing competences which need to be learned by learners, (3) learning in group of electronics vocation is always stressed on process aspect and procedure by evaluating the learning proportionally. By considering this statement, conceptually, educator has to be able to notice the relation consistently between the component of instructional design and learning process needs to be integrated in learning system.

Learning process in vocational high school majoring in vocational electronics needs some learning strategies, such as; product basic learning, and competency basic training. Those two strategized demand the completeness of learning by learners. Therefore vocational learning is developed using learning strategies, such as: (1) mastery learning which prioritize the learners to have sufficient time to master every competencies based on the learning materials learned, (2) learning by doing in which the learning process is done through some activities which provide learning specific experiences in industry, (3) individualized learning which is a learning process by noticing vocational characteristics of the learners so that every learning strategy used is appropriate with learners' characteristics.

The implementation of learning strategies needs to consider some supporting factors, such as; (1) instructional materials, (2) learning facilities in workshop/laboratories, and (3) pedagogic competence of educators, and also (4) learning sources used. Those factors become precondition needed to be prepared by educators in implementing instructional design made so that learners' competence can be achieved optimally. To achieve those supporting factors, vocational learning especially in electronics department need to concern some learning patterns which are: (1) learners centered learning, which means every learning activity was focused on learners' need, (2) interactive learning between educators and learners or between learners and instructional materials, (3) learning in group or team based learning by utilizing learning media which is appropriate with competences need to be achieved in learning.

The quality of instructional design is an effort to educate learners which needs to be done by educators as their profession demands. In other words, learning is seen as interactive process among educators, learners and learning sources in classroom. Therefore, the implementation of learning should be designed, done, evaluated effectively and efficiently. In other words, the main tasks of educators are: (1) planning/designing the learning, (2) implementing the learning, and (3) evaluating the learning. These three tasks are integrated activities which cannot be separated one with

another. Thus, instructional design is strategic activity, because the implementation and evaluation of learning mostly depend on instructional design made by educators. Several experts [14], [3], [6] had simplify stages of activities of instructional design as visualized below:

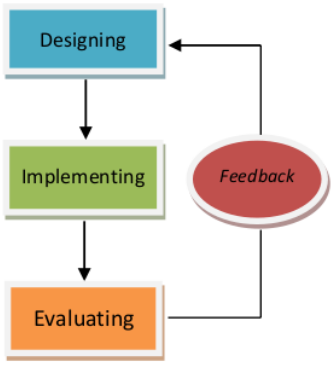

Figure 1. Stages of Instructional design

Stages of instructional design is a professional obligation of educators to formulate structure of instructional materials in syllabus and lesson plan as a reference in doing learning process in classroom situation. This shows that instructional design is an indicator of the quality of learning which is necessarily needed by learners so that they will be accepted in work life or industry.

The result of theoretical review shows that the quality of learning components inside the syllabus should presents the following: (1) description of indicators of competences to be achieved, (2) selection of instructional materials for the learning process, (3) the plan of learning activities, (4) assessment components, and (5) the selection of the available learning sources [7], [4].

Instructional design is an activity of an organized procedure that includes the step of analyzing designing, developing, implementing and evaluation instruction [11]. This activity is instructional design activity procedurally done and consistently organized. Analyzing activity refers to the process of defining instructional materials presented to be learned by learners to achieve the competences. Designing or planning activity refers to an activity of specifying learning condition, or a procedure of specifying learning strategy to be used. Developing activity refers to a writing process and producing instructional materials in physical form or may be still in form of blueprint which is ready to be used. Implementing activity refers to the practice of instructional materials usage and the implementation of strategy in the real classroom situation. Evaluating activity refers to the process of deciding the effectiveness of learning using a series of test on learning achievement and the tryout of learning product. Those are the series of activities which are main procedure in implementing learning to achieve learning objectives.

Instructional design is design of components which are linier procedural and systematic activities and which are related one another; therefore every instructional design component has syntax or stage. In this case the prior stage should be done completely before doing the next stage to check and match the next stage. The placement of stages is done based on the order consistently and cannot leap over stage which is not in its order. Here is where the consistency in designing learning process takes place.

The result of researcher's review shows that generally the model of instructional design has five main stages which are: (1) formulized indicators and learning objectives, (2) writing evaluation instruments, (3) deciding learning activities or learning strategies, and (5) assessing learning program (Dick and Carey, 2014, Kemp, 2001, Briggs-Wager, 1980, and School-Based Curriculum 2008).

Some reviews have been proposed regarding instructional design and can be inferred that every instructional design model has unique character to differ one another; however researcher's review shows that there is no one instructional design which is the best for all learning condition[12]. Therefore, instructional design used by educators of vocational department is expected to consider entry behavior of learners. If this is considered in designing learning, so instructional design model used by educator will be not only one, but has to be varied, considering that all entry has different characteristic. However this review set five main components in designing learning (1) learning objectives, (2) instructional materials, (3) learning activities, (4) the use of learning sources, and (5) assessment, (6) feedback. The order in designing learning cannot exceed one another and is expected to be appropriate with the order systematically. This can be inferred that every instructional design has different dimension and scope. Therefore, component of instructional design is systematic process which procedural and can be visualized as follows:

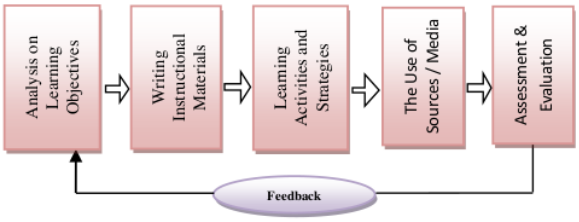

Figure. 2. Instructional design Procedure

The procedure of instructional design based on Figure 2 can be described as follows.

1. *Analysis of Learning Objectives*
   Deciding learning objectives is done to state the competence which can be done by learners during and after the learning process. Sating learning objectives can be classified as two objectives, general learning objectives (TUP) and specific learning objectives (TKP). TUP is general statement regarding the result of the learning which visualizes basic competence which needs to be achieved in the end of learning process. TKP is specific statement regarding the result which needs to be achieved. That result of learning is in form of sub skills which are cognitive skill and certain technical skill (vocation) as stated in basic competence. In stating TKP should refer to the taxonomy based on the result of

competence analysis. In stating TKP should refer to attitude, condition, criteria (degree) of success or audiences' response, behavior, condition, degree [7], [13]. Besides, Gagne and Briggs (2011) add with the name learning capability. Determining learning objectives is instructional design component which demands educators to achieve the expected competences in learning, and also as a basis to make questions or test in the scope of instructional materials.

2. *Writing Instructional Materials*
   Educators are able create instructional materials in three ways, which are: (1) writing by themselves based on their experiences as educators (starting from scratch), (2) creating instructional materials from the existing information or any existing materials from any sources (information repackaging or text transformation), (3) organizing existing information or instructional materials in some sources (compilation or wraparound text). Writing instructional materials at first is done based on assumption that the educator has had the knowledge written as instructional materials to be presented to the learners. Writing instructional materials can also be done in group or by consulting with the expert of instructional materials.
3. *Learning Activities and Strategies*
   In determining learning strategies, there are some factors which need to be considered by educators, they are: (1) learners' level of motivation and their readiness in following the learning process as an effort of making the learners to be ready to follow a series of instructional materials explanation prepared by educators, (2) conveying the procedure regarding things which will be done by the learners during up to the end of learning process, (3) informing the learners regarding pre-requisite competences of learning (entry behavior) needed so that learning objectives can be achieved, this can be done using short test or informing grade limitation in learning. These three strategies can be done in the same time and can be ended by giving feedback so that learners' learning retention in reviewing all information's which have been conveyed in learning process can be reviewed whenever needed, either the need of answering information or answering the learning process instruction.
4. *The Use of Learning Sources/Media*
   Deciding learning sources/media is one of important activity of educator to do learning process which should be based on instructional design. In deciding appropriate learning media should be based on the type of the content of instructional materials such as: fact, concept, principal, procedure, and also procedure on how to use, to save, and to test, so that the learners can achieve learning outcome as how it is stated in learning objectives.
5. *Assessment/Evaluation*
   Assessing, especially assessing the result of learning, is the last process in learning process in a instructional design. Assessment includes all ways to assess competence or learners performance individually or in group. Evaluation is a process of interpreting to obtain a decision regarding information of learning activities which has been done by learners during the learning process.
   Instructional design in vocational high school, its learning assessment focuses on the assessment of learning result (fact, principal concept, and procedure), meanwhile learning evaluation is done to evaluate learners; performance in the domain of; cognitive, affective, psychometric.
6. *Feedback*
   Giving feedback is the last activities in learning process before the end of learning process. Generally in this activity, educator gives short test, makes summary, reflects on the learning process and gives follow up activity in form of structured tasks to be done after the end of learning process.

METHOD AND RESULTS

The research on the quality of instructional design made by the vocational educators of vocational high schools for electronical classes in Makassar is documentative research using content analysis method. The result of prior observation obtained the subjects which are 37 educators of electronics which have made instructional design. The next step is gathering instructional design made by educators of spectrum competence majoring in Audio Video which are 21 drafts, and spectrum competence majoring in communication electronics which are 14 drafts. Thus, the total instructional designs made by educators obtained by researcher are 72 drafts. Instrument used is component quality sheets of instructional design using criteria of very good, good, poor, and very poor. The interval of assessment in instruments of component quality of instructional design using indicator percentage criteria toward each component of instructional design is:

Table 1. Interval percentage of component quality of instructional design

Value	Interval Percentage	Criteria
4	81%<X<100%	Very Good
3	61%<X<80%	Good
2	41%<X<60%	Poor
1	21%<X<40%	Very Poor

To know the quality of instructional design component content analysis is used. The use of this method is to know the level of the importance of each instructional design component by looking for the average score of content toward standard of deviation.

Based on the result of analysis on all instructional designs made by vocational educators in vocational high school majoring in electronics department can be concluded that the result of the study is as follows.

Table 2. The result of instructional design component analysis Subcomponent learning objectives

No.	Formulation of Indicators	Obtained Score %
1	Having complete component of formulation of objectives	97
2	Formulated based on Standard of competence, basic competence	91
3	The writing of learning objectives using operational verbs	83
4	Written in form of complete sentences	65
5	Visualizing learning process	87
6	As the basis in making test for learning result	68
7	There is no double meaning in the learning objectives	92
8	There is only one step or activity in each learning objective	89

Table 3. The result of instructional materials components analysis

No.	Indicators of Instructional materials Component	Obtained Score %
1	The validity of the content of instructional materials based on syllabus.	90
2	Instructional materials have the latest content.	92
3	The validity of analog series of figures	97
4	The validity of formation or comparison.	98
5	The quality of the print out.	74

Table 4. The result of learning activities or strategies components analysis

No	Indicators in Determining Learning Strategies	Obtained Score %
1	Pre-learning activities	91
2	The presentation of information and enforcement	98
3	Learners' activities	53
4	Assessment/evaluation	67
5	Giving feedback	47

Table 5. The result of the use of sources/media components analysis

No	Indicators of The Use of Sources /Media	Obtained Score %
1	Attractiveness	78
2	Clarity of symbols system	68
3	Appropriateness with the scope of instructional materials	92
4	Easy to be used	90
5	Time allotment15-25 minutes	93

Table 6. The result of assessment/evaluation components analysis

No	Indicators of Assessment Component	Obtained Score %
1	Measuring all aspects of learning	93
2	Done in the whole session of learning process	56
3	The result of assessment is used as placement/ranking	89
4	Instrument of assessment measure all competences	91
5	Instrument assessment of learning activity	86

Table 7. The result of feedback components analysis

No	Indicators of Giving Feedback	Obtained Score %
1	Giving short test	92
2	Making summary	60
3	Giving reflection	46
4	Giving structured task	58

Based on the result of the analysis of the component of instructional design made by vocational educators in vocational high school in Makassar, it can be concluded that there are six main components in instructional design which can be explained by looking for the average score and standard of deviation in all components in the following table.

Table 8. The Summary of Instructional design Components Analysis

No	Instructional design Components	N	Min	Max	Mean	Std. Dev.
1	The Set of Learning Objectives and Indicators of Competencies.	72	1	5	3.267	.7910
2	The content of instructional materials competences (main materials).	72	1	5	3.483	1.1035
3	The plan of Learning Activities or Strategies.	72	1	5	3.247	1.0164
4	The Use of Sources/Media.	72	1	5	2.467	.72613
5	The set of assessment/evaluation.	72	1	5	2.091	.67515
6	Giving feedback.	72	1	5	2.014	.78831

The summary of the analysis result in table 6 is obtained and explains that the quality of six components in instructional designs made by educators can be described that the result of this study is in two categories which are good and good enough. The components of instructional design which are in good category are: (i) The formulation of learning objectives, (ii) instructional materials component, and (iii) the plan of activities or the determination of learning strategies. Meanwhile, those which are in good enough categories are: (i) the use of sources/media, (ii) the determination of

assessment/evaluation, (iii) giving feedback. By considering the average score and standard of deviation for six components of instructional design, instructional designs in general can be called as having good qualification. It means the components in instructional designs made by vocational educators can be used as means to know the quality of learning process which is done in electronical learning.

The quality of instructional design components for formulating learning objectives, instructional materials component, activity or determining learning strategy can be discussed that, those three components are main component owned by educators as the main requirements in fulfilling educators' certification in vocational high school of Makassar. Meanwhile the components of using of sources/ media, determining assessment, and giving feedback are in very good quality, this is the weakness comprehensively on educators in understanding the importance of the three components to more activate the learners during the learning process. This is caused by the educators which still focus on the completeness of instructional materials as one of the requirement in fulfilling educators' certification.

Some weaknesses found in the result of the study show that instructional design made by educators of vocational electronics has the same understanding, especially the writing of learning objectives which uses passive sentences and uses more than one verb for one learning objective, the verb is used more in skill verb. The result of theoretical review shows that the writing of learning objectives in learning of vocational high school should use operational verb which is in active form, not in passive form (Regulation of Ministry of National Education 41/2007. School-Based Curriculum –Vocational High School 2008). Therefore, the result of the study is in line with Franklin's statement [5] that learning objectives made by vocational educator of electronics department precisely used to state *Output Indicators*, which is indicator used to measure learning competences in form of procedure. This inexpediency shows that the learning objectives made by educators do not really pay attention to the competences which should be achieved by learners. Therefore, remedial on the definition for educators in formulating indicators of learning objectives is needed as the basis of developing learning so that the process and the result of learning will be better.

There is another inexpediency found between scope of instructional materials and the formulation of learning objectives. In this case is presented in table 7 that there are some basic weaknesses among the explanations of main topic in the instructional design. This actually do not need to be happening because in School-Based Curriculum of Vocational High School 2008 as reference of educator in Indonesia is shown that every topic should be chosen carefully and developed based on the indicator of learning objectives (*learning lutcome*). The weakness of this finding shows that educators have not fully decided on instructional materials based on the formulation of learning objectives.

Finding for activity component of learning strategy produced in good category based on table 7 while in table 3 it is known that: (1) the formulation of real learning activities have not visualized the real learning activities based on instructional design, (2) there has not been a learning activity which involved mental and physical process through interaction among learners, between learners with educator, and between learners and instructional materials, (3) learning process has not referred to student centered learning, (4) learning activities has not in line with varied competences which should be mastered by learners. The result of this study shows that learning activities designed by educator in order to give learning experience which involves mental and physical process through varied interactions inside and outside the classroom using varied approaches.

The next finding, the component of sources selection, assessment, and feedback can be categorized as good enough. Some weaknesses found such as simple learning sources and cannot support the learning process. The weakness of learning assessment has not met the standard of the Regulation of Ministry of National Education (2007)[1] because: (i) the assessment has not referred to the formulation of indicators in the learning objectives, (ii) the assessment is done by educator only focuses on the assessment technique without referring to assessment procedure, (iii) technique used is not always appropriate with the indicator for learning objectives. Component of feedback is found to be very simple and the closing of learning process and giving simple task, so that the learning process is closed by common expression. This assessment result category is not difficult to be explored so that it can produce better (authentic) assessment which needs to be exist in instructional design made by vocational educator of vocational high school in Makassar.

Based on the result of this study described above then can be concluded that: (1) generally the quality of instructional design component is not fully fulfill the component which has to be based on standard of process, (2) the determination of learning objectives component of learning outcome due to criteria, audience, behavior, condition, degree have not been written consistently in learning objectives, (3) the determination of instructional materials in main topics have not referred to the detail explanation in form of pointers as main focus, (4) the selection of learning strategies has not been done consistently based on systematic (introduction, main activity, closing activity), (5) as instructional design has not been fully found the procedure and assessment technique used to assess learning process, (6) giving feedback is done separately from the learning process so that the end of learning process does not give enforcement and learning motivation to the learners.

CONCLUSIONS AND SUGGESTIONS

From the result of this study can be made some conclusions that there are some weaknesses found in the instructional design, however these findings are relevant and useful to visualize the existing instructional design made by the current educators. The result of this critical review shows that: (1) teachers' beliefs on the importance of instructional design component is varied, it is expected that there is educator which believe that this is only administrative activity so that the function on the learning process is not related in improving the quality of learning process and learning outcome, (2) teachers' understanding on the instructional design and its development is still low, if it is related to scientific approach in order to develop vocational skills of

learners, (3) educators' point of view on instructional design as a guidance in learning process is still relatively simple, (4) educators' ability to design and develop instructional design still needs guidance and supervision so that educators can make instructional design with better quality.

Remedial effort on the quality of instructional design made by educators it is suggested that: (1) the need of enforcement to educators that instructional design is made not only for administrative purposes but also for professional development for every educator, (2) design and development of learning process should be done continuously because every design component has certain function and has strong relation with the quality of process and learning, (3) the effort of improving educators understanding and competence need to be continuously improved based on learners' characteristic through varied experiences among the learners in their vocational program which is Electronical Department continuously until good instructional design can be made to be implemented in vocational high schools in Makassar.

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