



## Context-Based Evaluation Materials in Elementary Teacher Education Program: A Developmental Research

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### ABSTRACT

This research was a two-year developmental research that has resulted in validated teaching materials. The second-year of the research purposed to develop instructional evaluation materials, which can help to improve the quality of student learning outcomes. The teaching materials were used for elementary school student teachers at Universitas Sebelas Maret Surakarta Indonesia. Content validity of the developed materials was further assessed and ensured by an expert. These materials were contextually implemented in their classes to measure their effectiveness levels. Through a quasi-experimental research methodology, one control group and one experimental group were selected for the sample of the study. Data revealed an increase in the experimental group's learning outcomes of evaluation subjects as compared with the control group. This showed the effectiveness of instructional evaluation materials. The results of paired-samples t test (t-count value = 3.457 and t-tab = 1.980) rejected  $H_0$ . The results indicated that there was a significant difference between the experimental and control groups' mean scores of post-test. The current study concludes that the teaching materials have resulted in more effective results.

**Keywords:** Contextual approach, elementary teacher education, instructional evaluation materials, learning evaluation.

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### INTRODUCTION

'Learning Evaluation' course at elementary teacher education program covers 'evaluation concept, evaluation technique, model and design of learning evaluation, scoring and processing learning outcomes/results, validity and reliability.' This e-course enables elementary school student teacher's to provisionally implementing their gained knowledge of assessment and learning evaluation to elementary schools in their future teaching careers. The course includes designing assessment instruments, testing instrument quality, and scoring through processing evaluation results. Because evaluation course handles the loaded data and scored learning results within statistical formulas, it requires to equip them with designing instruments and analyzing their data.



The 'Learning evaluation' course, which is a compulsory course for the fifth year of elementary teacher education program in Indonesia, is mostly available in Universitas Sebelas Maret. However, since the course is taught without using elementary school-related materials, it seems to have less contextual aspect. Elementary school-based teaching materials with a contextual approach have not still been existed yet. Therefore, we tried to contextually develop teaching materials for the 'learning evaluation' course in elementary teacher education programs.

Given learning outcomes for the course 'Learning Evaluation', student teachers are not satisfied. So, it necessities to develop the teaching materials of learning evaluation. Hence, they may improve their own understanding and learning outcomes of the basic evaluation concepts. The materials will also be very helpful for teachers in facilitating student learning. Teachers may freely develop any teaching material in regard to the subject matter knowledge.

Teaching materials, which are prepared based on the goals or objectives of the learning, need to include students' knowledge, skills, guidance, training, and feedback. In view of Nieveen (2007), teaching materials are qualified if they meet validity, practicality, and effectiveness of the teaching. The teaching materials are systematically arranged to show the students' competencies that can be used in the learning process (Majid 2013; Prastowo, 2012). Further, Tomlinson (2001) (cited in Harsono, 2007) stated that "materials mean anything which are used to facilitate the learning process of students" (p.30). Teaching material, which include textbooks, workbooks, cassettes, CD-ROMs, videos, photocopied handouts, newspapers, etc., are used to impart knowledge (Tomlinson, 1998).

To improve the students' understanding is expected to develop through compilation or wrap around text, because there has been no special book for 'Learning Evaluation' course in elementary teacher education program. 'Learning Evaluation' materials that have still been used for the sources from the internet, and evaluation books. The available teaching materials are still limited and some of them are less relevant to the current curriculum. Although all these sources are complementary, students may not have or access all related sources. These conditions direct the students to be very dependent with the lecturers and result in less interactive learning process in the classroom.

The main problems of this research are as follows: (1) Students have difficulties in understanding the subject matter of 'Learning Evaluation' course, (2) student learning outcomes in 'learning evaluation' subjects are still low achievable since most of students fail to have 'enough score and completeness' criteria, (3) The unavailability of the teaching materials in the present condition in that teaching responsibilities challenge students' learning and evaluation progresses that threaten their subject matter knowledge of evaluation. Teaching materials play a central role in teaching and learning. Garton and Graves (2014) stress the importance of the teaching materials with the following statement: "Materials are fundamental to learning and teaching but materials cannot be viewed independently of their users (p. 11)."

Teaching materials, which intend to achieve the expected goals, namely complex competencies or sub-competencies, are a set of learning tools that contain learning materials, methods, limitations, and systematically evaluation (Widodo and Jasmadi in Lestari, 2013). This means that a teaching material should be designed and written with instructional rules because lecturers will use it to support student learning. Teaching materials contain students' needs of knowledge, skills and attitudes to achieve the national standard(s) of competence. Azarnoosh (2016) emphasizes this case with the following statement: "Materials development is a practical undertaking involving the production, evaluation, adaptation and exploitation of materials intended to facilitate language acquisition and development (p. 2)". Teaching materials are systematically arranged materials that allow students to learn throughout a creative learning environment or atmosphere. A book, as a teaching material, plays an

important role in learning in the classroom (Abed & Al-Absi, 2015; Sinarta & Brouhron, 2011). Previous studies suggest that many of the current teaching materials are not standardized (Asliyani et al, 2014; Lubis et al, 2016; Manalu et al, 2016).

Majid (2012) states that "teaching materials are all forms of materials used to assist instructors in carrying out learning activities. Teaching materials is one of the learning resources used in teaching and learning in the classroom (p.173)." Ahmadi (2011) depicts that "teaching materials are all forms of material used to assist teachers/instructors in carrying out teaching and learning activities in class (p. 208)." Independent teaching affords students to systematically complete and achieve meaning (Syaodih, 2015). In view of Harijanto (2007), teaching materials serve to provide a clear lesson guidance between instructor/lecturer and students and to achieve the determined ability for every learning activity. So it can be concluded that the teaching materials is a set of materials which is used by lecturers and students to help the creation of a good and planned learning process, to be able to make students achieve the competencies that have been set.

Effective teaching includes the using appropriate teaching materials to help students understand the material (Syawaludin et al., 2019). Teaching materials using Contextual Teaching and Learning (CTL) can be useful for teachers to develop media, and teaching methods. The developed teaching materials were contextual designed for the course 'Learning Evaluation.' The teaching materials of learning evaluation were validated by material and learning experts. Thereby, their effectiveness needs to be contextual tested in the classroom(s). The CTL approach focuses the students' experiences and interaction with others on building their knowledge. Thus, the students learn the real life materials through interaction and experience instead of drilling and memorizing. Hence, the CTL approach is suitable for the processes of teaching and learning, especially teaching/learning evaluation.

Contextual learning not only encourages students to make connections between their knowledge and their daily lives but also builds their conceptions via the learning process(es) (Neslihan Ültay, Muammer Çalık, 2012). Contextual learning will introduce learning content using various active learning techniques. Helping students connect their pre-existing knowledge to their expectations builds new knowledge by analyzing and synthesizing the learning process. In the end, they discover the meaning(s) of the learning process(es) because they strive to achieve the learning objectives by utilizing previous experiences and building on the existing knowledge (Berns & Erickson, 2001).

Sounders (cited in Komalasari, 2011, p.8) has released Relating- Experiencing- Applying- Cooperating- Transferring (REACT) strategy for contextual learning. In addition, Satriani, Emilia, and Gunawan (2012) reveal that the CTL approach effectively associates new knowledge with students' daily lives. Then, the student's role changes to construct a meaning instead of receiving a meaning (Baker, Hope, & Karandjeff, 2009). Relating the knowledge from the inside and outside of the classroom to their (future) lives makes learning more relevant and meaningful for the students (Hosnan, 2014).

The foregoing issues emerge the problems of this study: (1) Do the developed teaching materials of learning evaluation improve the students' learning outcomes of the 'learning evaluation' course? (2) How do the developed teaching materials of learning evaluation contextually affect their applicability in the classroom?

In general, the purpose of this study was to develop the teaching materials of the 'Learning Evaluation' course that can improve students' learning outcomes. The objectives of the current study were to: (1) analyze any improvement in students' learning outcomes of 'Learning Evaluation' subject and (2) find the effectiveness of CTL-based teaching materials for the 'Learning Evaluation' course.

## **METHODS**

### **a) Research Model**

Research and development (R & D) method develops a specific product and tests its effectiveness. The product of this research was contextual teaching materials of the 'learning evaluation' course. To develop and test their effectiveness a particular development model was used. In general, research and development developed by Sukmadinata (2009) and his colleagues consists of three stages: (1) preliminary study, (2) development, and (3) examination (Nana, 2006). The first stage (preliminary study) investigates the needs of students and lecturers. The current study included three activities: (a) doing the literature study, (b) conducting the survey field, and (c) making the initial draft of the product. The development stage comprises of production, expert validation, and draft revision.

The examination stage composed of pilot-test, final revisions, and quasi-experiments. The pilot-study intended to evaluate the quality and feasibility of the teaching materials of the 'learning evaluation' course. The quasi-experiment sought to determine their effectiveness on students' learning outcomes.

### **b) The Sample of the Study**

The sample of the study was selected via cluster random sampling from the student teachers, who attended the 'learning evaluation' course in elementary teacher education program at Universitas Sebelas Maret Surakarta, Indonesia during the 2018/2019 academic year. The sample of this study consisted of two intact groups, who took the 'learning evaluation' course in the department of elementary teacher education in the city of Kebumen and Surakarta central Java Indonesia. The experimental and control classes were random assigned. The experimental class was taught with contextual teaching materials of the 'learning evaluation' course, while the control class was used via conventional teaching materials.

The instruments of this research included a questionnaire, interview, and test. The questionnaire and interviews were utilized to elicit the needs of assessment and remedial teaching. The questionnaire also measured the validity of the model, while the test was exploited to determine the mastery of the evaluation concept.

### **c) Data Collection Tools**

The instruments for this research included a questionnaire, interview, and test. The questionnaires and interviews were utilized to collect data on the needs of assessment and remedial teaching undertaken by teachers. The questionnaire was also used to collect data on the validity of the model. The test was used to determine the mastery of the evaluation concept.

### **d) Data Analysis**

The data were qualitatively and quantitatively analyzed. That is, the average scores were quantitatively analyzed using four categories, i.e., excellent, good, fair, and poor. The interview results were descriptively and qualitatively analyzed. The post-test scores were exposed to independent samples t-test to determine the effectiveness of the developed teaching materials.

The instruments were used to measure the students' learning outcomes of the 'learning evaluation' course. The questions in the test contained multiple-choice items and essays. The test instrument incorporated the following steps: (1) Assessing the curriculum/syllabus, (2)

Establishing basic competencies, and indicators, (3) Developing a grid of questions and (4) setting assessment indicators. The validity of the instrument with multiple choice items was used to calculate the item analysis with the biserial Point formula as follows:

$$r_{pb} = \frac{M_1 - M_0}{s_n} \sqrt{pq}$$

$r_{pbis}$  = biserial correlation coefficient

$M_1$  = the average score of the participants, who answered correctly for the item sought for validity

$M_0$  = average total score

$s_n$  = standard deviation of the total proportion score

$P$  = the proportion of the participants, who answered correctly

$P$  = the number of participants, who answered correctly

$A$  total of participants

$Q$  = the proportion of the participants, who answered incorrectly ( $q = 1-p$ )

As for the validity of the description or essay using product moment formula, the formula of product moment is in the following:

$$r_{xy} = \frac{n \sum xy - \sum x \sum y}{\sqrt{\{n \sum x^2 - (\sum x)^2\} \{n \sum y^2 - (\sum y)^2\}}}$$

$r_{xy}$  = Correlation index number "r" product moment

$N$  = Number of samples

$xy$  = number of multiplication products between scores  $x$  and  $y$   $x$  = total number of scores  $x$  (pertinent item)

$y$  = total number of scores  $y$  (total number of items)

The formula of independent samples  $t$ -test for testing the modelis as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \left( \frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Before the independent samples  $t$ -test, the researchers firstly tested normality of the distribution and the homogeneity of data variances. If the data are normally distributed and have the same homogeneity using independent samples  $t$ -test is reasonable and plausible.

## FINDINGS

Before the teaching interventions at the experimental and control groups, the pre-test was administered to know their initial capabilities/capacities. After the treatment, the post-test was re-administered to check any change or improvement at these groups.

The average results of the pretest showed that there was not too much difference between the experimental (72.20) and control (71.17) groups. This means that the average initial ability of the experimental group was almost similar to that of the control one.



The average results of the post-test were found to be 82.07 for the experimental class and 78.50 for the control class. This implies to increases in the average values of the experimental and control classes. Phrased differently, use of the teaching materials of the 'Learning Evaluation' has resulted in better progress/improvement in the experimental class as compared with the control one.

Validity was measured via SPSS 15.0<sup>TM</sup>. The test with 25 multiple-choice items was pilot-tested with 20 respondents. The pilot-study revealed that only one item was less valid. But, the problem was then fixed.

Cronbach Alpha value was found to be 0.91. The r table value for the two-sided test at the 95% confidence level or 5% significance ( $p < 0.05$ ) can be searched based on the number of respondents or N. That is, the fact that Cronbach Alpha value (0.91) was larger than r table (0.396) indicated that the tested questions were reliable.

Before using the Independent samples t-test, the researchers checked data normality and homogeneity. Normality test is used to determine whether the data show normal distribution or not. If the test p-value is less than the predefined significance level the data are non-normal. If the test p-value is greater than the predefined significance level, the data are normal. If the data are normally distributed, parametric statistical test is used to analyze the data. If not, non-parametric statistical test is employed. The normality test uses Kolmogorov-Smirnov-Z technique at SPSS 15.0<sup>TM</sup>.

The results of pre-test appeared 1,28 for value Z and 0,07 for Significant Assumption. Since the values of Z and Significant Assumption were equal to 0.05, the experimental class was normally distributed for the average data. The same was valid for the control one (value Z was 1.32 and Significant Assumption was equal to 0.06). Namely, values of Z and Significant Assumption pointed to a normal distribution at 0.05.

For the post-test, the results of normality test at the experimental class were found to be 1.08 for value Z and 0.18 for significance while those for the control class were 0.68 for value Z and 0.73 for Significant Assumption. These values mean that the average data in the experimental and control classes are normally distributed.

Homogeneity test is used to find out whether the data from experimental and control classes have the same variant value. The fact that significance level is equal to 0.05 shows the same/different (homogeneous) variant value. If significance level is lower than 0.05, the data do not have the same/different (heterogeneous) variant value.

Levene homogeneity test of the pre-test was found to be 0.01 with  $p = 0.92$ , while that for the post-test was calculated to be 0.01 with  $p = 0.89$ . Because the value obtained from the homogeneity test of significance level was equal to 0.05, the data have the value of the same variant/not different (homogeneous). Furthermore, the data could be analyzed by the Independent Samples t-test.

The pre-test and post-test of the experimental and control classes aimed to determine an increase in the score. The conclusion of the study is significant if  $t_{count} > t_{table}$  at 5% significance level and p value  $< 0.05$ . The summary of paired-samples t test for the experimental class is shown in Tables 1-2.

**Table 1.** Paired-samples t-test for the experiment group

Class	Average	$T_{hit}$	$t_{table}$	p
Pre-test	71.17	11.74	1.68	0.000
Post-test	82.07			

As seen from Table 1, the average score from the pre-test (71.17) to the post-test (82.07) was increased. Also,  $t_{hit} > t_{tab}$  at the level of significance 5% ( $11.74 > 1.68$ ) had a

value of  $p < 0.05$ . This means a significant improvement score for the experimental class.

**Table 2.** Paired-samples *t*-test for the control group

Class	Average	$T_{hit}$	$t_{table}$	p
Pre-test	72.55	5.95	2.02	0.000
Pos-test	78.50			

As observed in Table 2, the average values of the pre-test and post-test were counted to be 72.55 and 78.50 respectively. Then, it also obtained that of 5.95 with significance of 0.00. The value of  $t_{table}$  at  $df$  (degrees of freedom) 39 was 2.02 ( $5.95 > 2.02$ ) and had  $p$  value  $< 0.05$  at 5% significance level. This means there is a significant differences between pretest and post test in the control class. Additionally, this study also examined whether the experimental group was better at the learning outcomes of the 'learning evaluation' course than that of the control one. The results of the independent-samples *t*-test are presented in Table 3.

**Table 3.** The results of the independent samples *t*-test for the experimental and control groups' post-test mean scores

Group	N	Mean	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
Experimental class	40	82.07	4.39	.69	3.46	.001
Control class	40	78.50	4.84	.76	3.46	.001

The pre-test's mean scores were significant different for both groups. Next, this study assessed whether the post-test's mean scores were significant for both groups. The results of the independent-samples *t*-test revealed that both of the groups were significantly different in achieving the 'evaluation' subject after the teaching interventions.

Levene's test analysis showed the Equal Variances Assumed  $F_{hit} = 0.02$ ;  $P$  (Sig) = 0.89. Therefore, non-significance value ( $p > 0.05$ ) indicated that  $H_0$  was accepted or both variants of the population were equal. The summary of Levene's test analysis is shown in Tables 4.

**Table 4.** The summary of Levene's test analysis

Levene Statistic	df1	df2	Sig.
.017	1	78	.897

The independent samples *t*-test revealed that the  $t$  value in equal variances assumed was  $t = 3.46$  and  $p$  (sig) 2 tailed = 0.001. A significant value ( $p < 0.05$ ) showed that  $H_0$  was rejected or both the average population was not the same. Comparing  $t$ -count values with  $t$ -tables provides that: if  $\pm t_{hit} < \pm t_{table}$ , then  $H_0$  is accepted and  $H_a$  is rejected. If  $\pm t_{hit} > \pm t_{table}$ , then  $H_0$  is rejected and  $H_a$  is accepted.

Given the values and standards  $t$ -count  $3.46 > t$ -table 1.98 so  $H_0$  was rejected with  $t$  distribution table at the 95% confidence level ( $\alpha = 5\%$ ),  $\alpha$  value referenced  $\alpha/2 = 0.025$ , degree Free ( $df$ ) =  $n-1 = 80$ ,  $t$ -table = 1.98 that is, there was a significant difference between the experimental (taught by the developed teaching materials) and control (instructed by the conventional teaching materials) groups' post-test mean scores. In other

words, the teaching materials accompanied with contextual approach were more effective in improving the participants' learning outcomes than the conventional ones.

## **DISCUSSION and CONCLUSION**

One way to improve students' learning outcomes is to develop a communicative and easy understandable teaching material. Systematical learning materials arrange learning sequence and facilitate student learning. In addition, teaching materials are also unique for a specific goal of learning process(es). The 'specific' term means to design the content of the teaching materials and achieve a certain competence (Sungkono, 2009). Belawati (2003) argues that the teacher roles for the teaching materials: 1) save their times in teaching; 2) change their roles as facilitators; and 3) create an effective and interactive learning process. The student roles of the teaching materials are as follows: 1) they are able to study without a teacher or peers; 2) they are able to learn anywhere and anytime; 3) they learn in regard to their learning speed; 4) they learn in respect to their desired arrangements; and 5) they become independent learners.

The results of this study are consistent with those of Sukiminiandari et al. (2015) and Poerwanti Hadi Pratiwi et al (2016) reporting that the designed (alternative) teaching materials support scientific-based learning. The teaching materials should be related to the curriculum and student characteristics (Widyaningrum, Sarwanto, and Karyanto, 2013). The final product of this study was contextual teaching materials, which could motivate students to achieve maximal learning result(s). In view of Berns and Erickson (2001), contextual teaching and learning help students connect their gained content/knowledge to their daily life contexts.

The CTL approach has offered the School-Based Curriculum. Baker, Hope, and Karandjeff (2009) define the CTL approach as promising approach that actively engages students in improving their learning and developing skills. Thus, the CTL approach which, makes learning process more relevant and effective (Baker, Hope, & Karandjeff, 2009), establishes student learning through experience in place of verbalism manner. The theory of Dewey supports the CTL approach Hosnan (2014).

This research involves two classes--class A as an experimental group (taught by the contextual teaching materials) and Class B as a control group (exposed to conventional teaching materials). They took the pre-test before the teaching intervention. After the teaching intervention, the post-test was re-administered to them.

The average learning results of the experimental class rose from 71.17 in the pre-test to 82.07 in the post-test, while those for the control class were 72.55 and 78.50 respectively. This indicates that the experimental class performed better than the control one in this case, the use of CTL in the evaluation learning process seems to have guided the students to understand the concept of evaluation, make assessment instruments, and analyze their assessment results.

The CTL approach not only helps teachers and students to link their learning with the real-life situations but also encourages them to make connections between their knowledge and their practical/societal lives. Satriani, Emilia, and Gunawan (2012) claim that the CTL approach encourages students to connect their knowledge to their daily lives. This approach affords students to experience the materials rather than memorizing them (Satriani, Emilia, & Gunawan, 2012).

Given two groups' pre-test mean scores, it can be concluded that the experimental and control groups are not much different before the treatment. Also, homogeneity and normality tests ensured their accuracy levels in terms of the experimental and control groups' pre-test mean scores.

The current study reveals that the contextually developed teaching materials



improve students' learning outcomes. As described by Majid (2012), a teaching material that includes instructional guidance, achievable competence, training and evaluation tools, helps to create a good learning process. Besides, it also motivates students to achieve goals of the instructional. To produce good teaching materials of the course, lecturers should pay attention to their effectiveness in achieving the objective(s) of the learning process.

Furthermore, Hestiningrum (2013) states that the CTL approach constructs the student's interest to learn and let him/her accomplish meaningful learning. The successful learning can be perceived if students apply and implement their knowledge to their real lives. Because this research fostered the students to interact with other students, they tended to be more active in comparison to the conventional approach. Hence, the use of the CTL approach is more effective in teaching the 'learning evaluation' course than the conventional approach. This is in a parallel with Muhlison's research (2011) stating that the CTL approach is better than non-CTL as the conventional approach. It also advocates Ekowati et al.'s (2015) statement concluding that the CTL approaches affect students' activities and improve their learning motivations to be a master in developing the materials.

Based on the results of the Independent samples t-test for the post-test and Levene's test analysis (Equal Variances Assumed  $f_{hit} = 0.017$ ;  $P(\text{Sig}) = 0.897$ ;  $p > 0.05$ ),  $H_0$  was accepted or both variants of the population were equal. Next, the researchers analyzed the equal variances to test the significance of the average difference.

Since the  $t$  value in equal variances assumed was  $t = 3.457$  and  $p(\text{sig})$  2 tailed = 0.001;  $p < 0.05$ ,  $H_0$  was rejected or both of the average populations were not the same. The values ( $t$ -hit value = 3,46; " $\alpha$ " value referenced  $\alpha / 2 = 0.025$ ; degree free (df) =  $n-1 = 80$ ;  $t$ -table = 1.98), rejected  $H_0$  decision because  $t$ -count was higher than  $t$ -table. The hypothesis tested that the contextually developed teaching materials of the 'learning evaluation' course were more effective in improving students' learning outcomes than the conventional teaching materials. .

Even though some Indonesian researches have mostly concentrated the development of teaching materials on various topics/matters and/or contextual approach from elementary schools to higher education, developing the teaching materials of the 'learning evaluation' course through contextual approach have still been unexplored. The current study is unique to focus on this unexplored issue.

Ila Fadila and Hedi Heryadi (2010) reported the main and sub- discussion descriptions for more complete and up-to-date concepts in the teaching materials. Trisnarningsih (2007) concluded that an increase in student understanding of the 'Technical Demographics' course materials appeared a significant relationship between the understanding level of lecturing materials and student achievement. Hidayati et al. (2016) deduced that the teaching materials of NPC using a chemo-entrepreneurship (CEP) approach were valid in according to experts' opinions. Adlim et al. (2014) reported that the entrepreneurial integration in CTL increased the students' scores of the biotechnology concepts and learning motivation. Komalasari (2012) proved that the CTL was an effective learning approach in civic education. Irawati (2017) inferred that the developed instructional materials were suitable for learning content and students' responses to textbooks.

The results of the present research address the following conclusions: (1) the developed teaching materials of the 'learning evaluation' course improve the students' learning outcomes; and (2) the contextually developed teaching materials of the 'learning evaluation' course are more effective in improving their skills and knowledge than the conventional one

## Suggestions

In light of the results of the current study, lecturer should develop related teaching materials that motivate students to actively learn the content or context. Besides, the lecturers ought to develop various teaching materials to assist students in achieving the expected/planned competencies.

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