Evaluation of Teaching Material PPG SM3T Program in Civil Engineering

Yose Fajar Pratama, M. Giatman, Rusnardi Rahmat Putra, and Nurhasan Syah
Faculity of Engineering, Padang State University, Jl. Prof. Dr. Hamka Air Tawar, Padang, Indonesia

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Abstract: This research is a research evaluation of the teaching materials of PPG SM-3T Program in civil Engineering education. The background of the evaluation is because only 11.7% of participants passed the competency exam. The result of interview with several lectures in PPG SM3T program, was found the teaching material has weakness, such as, the material no up to date, not source from trust sources and the print quality very poor. The standard evaluation teaching material use standard from Kemenristekdiki, with 4 components such as content feasibility, completeness feasibility, language feasibility, and graph feasibility. The evaluation research model use discrepancy which compares standard and condition of teaching material PPG SM3T Program. In research use instrument validation by expert and for evaluation teaching material use expert from civil engineering and Indonesia language expert. The result of teaching material plumbing construction, on content feasibility is less, completeness feasibility is less, language feasibility good and graphs feasibility is less. The result evaluation teaching material concrete construction, on content feasibility is very little, completeness feasibility is very little, language feasibility very little and graphs feasibility is very little.

1 INTRODUCTION

Education problems in Terdepan, Terluar and Tertinggal (3T) by Adlim (2016:59), is the lack of teachers, differences in the quality of education, very poor educational facilities. Indonesian government resolves the education problems in (3T) by implementing the Sarjana Mendidik di daerah 3T (SM3T). after participants implement the SM3T program, participant can continue to Pendidikan Profesi Guru SM3T (PPG SM3T) program for one year.

Republic of Indonesia Law No. 14 of 2005 explains the importance of pedagogical, professional, social and personality competencies for teachers and PPG SM3T participants. Pedagogical competence is the teacher's preparation before learning, and how to evaluate learning. Professional competence is the ability of teachers to master subject matter in their field of study. Social competence is related to the ability of teachers to communicate, interact and adapt. Personality competence includes norms, law and ethics that apply in society.

Universitas Ngeri Padang is one of the universities implementing the PPG SM3T program. Data from SM3T UNP and Belmawa Ristekdikt website shows the number of participants is 206 people. The Result Ujian Kompetensi Nasional Mahasiswa Pendidikan Profesi Guru (UKMPPG) in Universitas Negeri Padang only 41.2% or 85 people graduated. Table 1 show the number of participants who graduated from PPG SM3T program.

Table 1: Number of participants and percentage of graduates.

No	Study program	Number of participants	Number of participants who pass the exam	%
1	Pendidikan Kimia	14	1	7.14
2	Pendidikan Bahasa Inggris	22	4	18.1
3	Pendidikan Geografi	18	0	0%
4	Pendidikan Biologi	18	18	100
5	Pendidikan Fisika	18	11	61.1

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6	Pendidikan Teknik Bangunan (PTB)	17	2	11.7
7	Pendidikan Jasmani, Kesehatan & Rekreasi	20	17	85
8	Pendidikan Anak Usia Dini	13	10	76.9
9	Pendidikan Pancasila dan Kewarganegaraan	17	0	0
10	Pendidikan Matematika	17	4	23.5
11	Bimbingan dan Konseling (BK)	15	1	6.66
12	Pendidikan Guru Sekolah Dasar (PGSD)*	0	2	-
13	Pendidikan Bahasa Indonesia	17	15	88.2
Jumlah		206	85	41.2

Table 1, show the number of participat PPG SM-3T program in Padang State University in 2017. The education study program whose participants graduated 100% was only a biology education. While the study program with the percentage of the least number of graduation is the education study program of Pancasila Citizenship and geography education. Especially for the building engineering education study program, the number of participants in the PPG SM-3T building engineering education program that was declared passed was only 2 out of 17 participants. Interview result with lecture in PPG SM3T, found a few things. first, teaching material have never evaluated. Second, content teaching material have never updated. Result of observation in PPG SM3T program found the teaching material is less appealing to users, it is evidenced by the design of the cover, and the placement of images that do not support the explanation of the material.

A teaching material according to Prastowo (2012:17) is a systematic set of information or materials that contains competencies that must be mastered by users of the teaching materials. M. Muhammadi (2014:1149) teaching materials is an element of universal teaching and there is no learning situation without teaching materials. The Division of Teaching Materials Asep Herry (2012:5) divides printed materials in several types, such as handouts, textbooks and modules.

Opinion of Kelik Purwanto (2017:193) The Handout is a compact, clear and easy to understand printed teaching material that contains the learning points. While the textbook according to Sitepu (2012:21) is a teaching material that must be learned by learners according to the level of education. The definition of a module according to Depdiknas (2008:3) is a learning goal that aims to help the users to learn independently, with the principles of goal oriented, Self-instruction, continuous programs, self-contained, cross referencing, selt evaluation.
Kemenristekdi (2017) and Masnur Muslich (2014:200), teaching material must have four aspect. First content feasibility, completeness, language feasibility, and graph feasibility. Masnur Muslich (2014:201), content feasibility is the suitability of the description of the material with the standards competence must be mastered by the user, the accuracy and depth of the material and supporting material of teaching material. The component of material suitability is a match between the competency standard that must be mastered with the material of teaching materials. The accuracy and depth of the material is directed at the accuracy of the principles, concepts, and illustrations contained in the teaching material, while the supporting material of teaching material covers the suitability of the material with technological developments, the recency of features and fostering creativity of the users of teaching materials

Completeness feasibility consists of three components that must be have, the first, teaching materials must be systematic, and have a balance between chapters. Both teaching materials are equipped with examples of questions and exercises that strengthen understanding of concepts or principles. The completeness aspect of the teaching material presentation has a summary that is presented at the end of each chapter.

The feasibility of the language of teaching materials is reviewed from three indicators namely suitability to the level of education of the users of teaching materials, communicativeness and wrangling or integration of the flow of thought. The graph feasibility of teaching material graphic consists of a leather design consisting of layout, typography and use of letters. The design of the contents of the book consists of the use of colors, layout of images, and completeness of the layout.

Based on these conditions, the researchers have evaluated the teaching material PPG SM3T Program to be reviewed from content, completeness, graphic, and language feasibility.

2 RESEARCH METHOD

This type of research is mixed methods with an unbalanced mixture. The Quantitive method is more dominant than qualitative method. Quantitive data is the result of the evaluation of teaching material used as primary data and collected by questionnaire. Qualitative Data is collected through interviews and observations. The instrument has been validated by expert. The formula to calculate the validity uses Aiken`s V coefficient.

$$V = \sum S/[n(c-1)] \quad (1)$$

S = r-lo.
r = The number given by the judge.
lo = Lowest validity assessment numbers.
n = Number of votes.
C = Highest validity assessment figures.

Table 2: Result of validation by experts

Indicators	V Value	V Index	Category
Content	0.833	0.79	Valid
Presentation	0.875	0.79	Valid
Language	0.875	0.79	Valid
Graphs	0875	0.79	Valid

2.1. Qualitative Analysis

Analysis of qualitative data using the Miles and Huberman whit interactive model, whit 4 aspect such as data collection, data display, data reduction and conclusion. For more details seep figure 1.

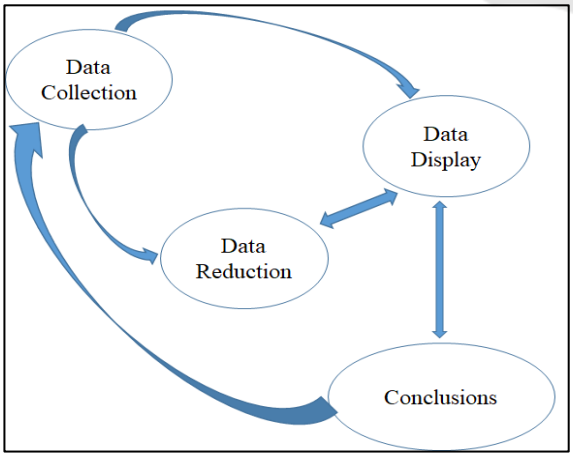


Figure 1: Qualitative Data analysis (interactive model) Source: Sugiyono, 2012

Figure 1 we can see the interactive model have four components, first data collection, obtained form interview and observation. Second data reduction is collecting data from interviews and observation in to several groups. Third data display is result from data reduction interview and observation. Fourth conclusion are the essence of the results of interviews and observations.

2.2. Quantitative Analysis

Quantitative data analysis uses the formula of Riduwan (2009:102) to determine the level of achievement of the teaching materials.

$$\text{Achievement level} = \frac{Average\ score}{Ideal\ Score} X100\% \quad (2)$$

Category the achievement teaching material use Nana Sudjana (2009:29), achievement level category.

Table 3: Achievement level Category

Percentage	Category
90%-100%	Excellent
80%-89%	Good
65%-79%	Enough
55%-64%	Less
0%-54%	Very little

3 RESULT & DISCUSSION

3.1 Qualitative

Result the interview with 10 lectures in PPG SM3T program, found several things, First, lecture used teaching material to achieve the competency of PPG SM3T. Second he quality of the contents and graphics of teaching materials need to be improved, especially on information updates and good print quality. Fourth the teaching material is accordance with the lattice exam.

3.2 Quantitative

The result of the evaluation of teaching material PPG SM-3T program in building Engineering education for plumbing construction, wood construction and concreate construction is are as follows.

3.2.1 Plumbing Construction

The results of the evaluation of the teaching materials of plumbing construction by experts can be seen in table 4.

Table 4: Evaluation result by experts

No	Feasibility	Achievement (%)	Category	Discrepancy (%)
1	Content	63.0	Less	37
2	Completeness	57.8	Less	42.2
3	Language	83.0	Good	17
4	Graphs	51.9	Very little	48.1

From the table 4 can be see the plumbing construction material from the content feasibility in category less with discrepancy 37%. The completeness feasibility is less category with discrepancy 42,2%. Language feasibility in category good, with discrepancy 17%. Graphic feasibility in very little category, with discrepancy 48.1%. To more clearly evaluate the result of the evaluation plumbing construction can see in figure 2.

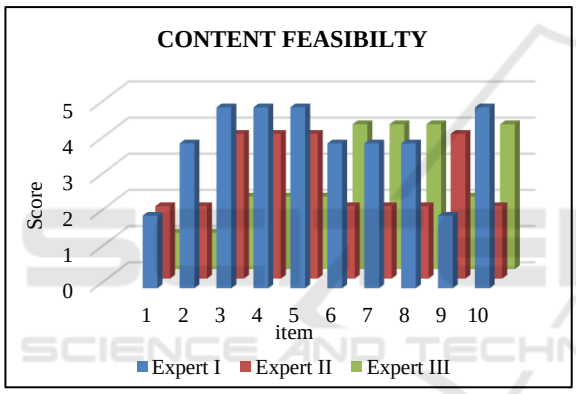


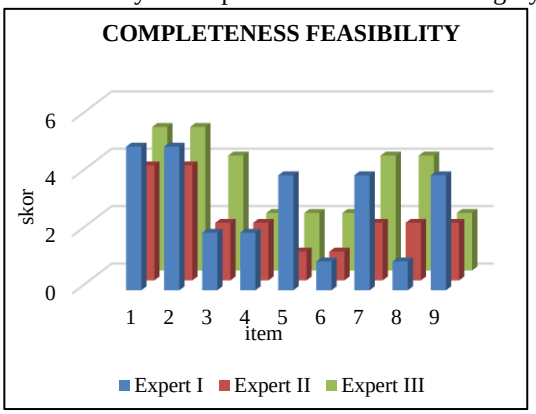
Figure 2: Content Feasibility

In Figure 2, it can be seen item number 1, 2 and 9 got the lowest from the experts. The item measures the basic competencies contained in the teaching materials as well as the clarity of concepts, formulas and procedures that the teaching materials are used for, while other items are in sufficient categories. Plumbing teaching material still use SNI 03-7565-2005, while there is now SNI 8153-2015. One of difference SNI 03-7565-2005 whit SNI-8153-2015 is, in SNI 8153-2015 not explain type of equipment use in plumbing work, whereas at SNI-8153-2015 it is explained.

The completeness feasibility teaching material plumbing construction can see in figure 3.

Figure 3. Completeness Feasibility

Based on Figure 3, educational evaluation teaching materials are very well-served and very good. It can be seen in items 1 and 2. The three experts give scores 5 and 4. But in items No 3, 4, 5, and 8 feasibility of the presentation is in the category



of less once. The cause of this is that the teaching material does not come with photographs or images and has no examples of questions, exercises, answers keys, and conclusions in each chapter. In figure 4 show the plumbing teaching material not have task list and bibliography.

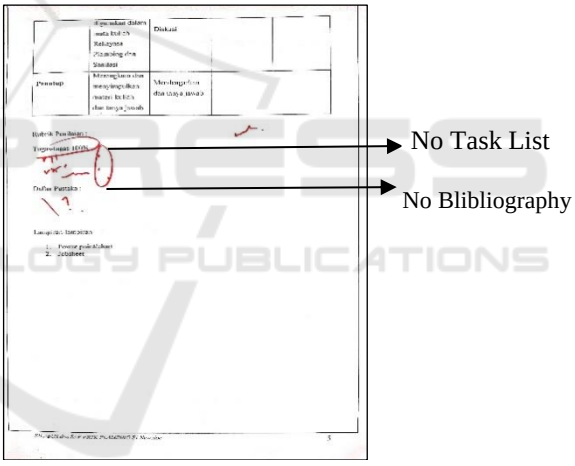


Figure 4. Plumbing teaching material completeness feasibility.

Result evaluation language feasibility teaching material plumbing construction can see in figure 4.

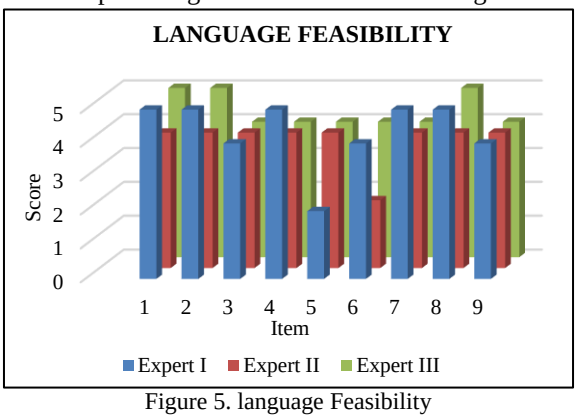


Figure 5. language Feasibility

Base figure 5, can see the plumbing construction in general is in good category, but on items 5 and 6 gets enough categories. At that number the teaching materials do not use a consistent symbol and the language used is less encouraging thinking skills. Graphic feasibility can see in figure 6.

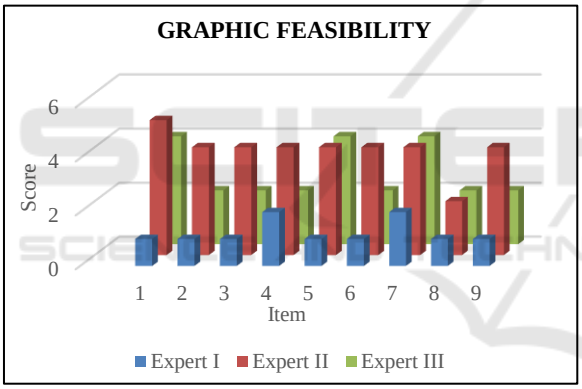


Figure 6: Graphic Feasibility

The feasibility teaching material the plumbing construction is categorized as less. This is because the picture not clear, not have maps, and the picture too small. In picture 7, give example the picture plumbing construction is not clear.

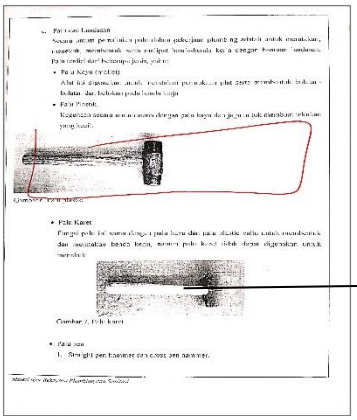


Figure 7.: The example the picture plumbing construction

Recommendations given to educational evaluation teaching materials are the teaching materials can be used with revisions.

3.2.2 Concreate Construction

The results of the evaluation teaching material competency evaluation of pedagogic materials of educational media conducted by the three experts can be seen in table 5.

Table 5: Educational Media Materials Evaluation results

No	Feasibility	Achievement (%)	Category	Discrepancy (%)
1	Content	60	Less	40
2	Completeness	44.4	Very Little	55.6
3	Language	71.9	Enough	28.1
4	Graphs	54.8	Less	45.2

In table 5, based on the results of evaluation conducted by the experts, the aspect of content feasibility and the discrepancy of the teaching materials are in the category less with the percentage of gaps 40% and 45.2%. The aspect of the completeness is in the category very little, with discrepancy 55.6%, while the language aspect is in the category enough with the discrepancy of 28.1%. To clarify the results of educational media teaching materials, picture 7 depicts the feasibility of the content of the concreate construction.

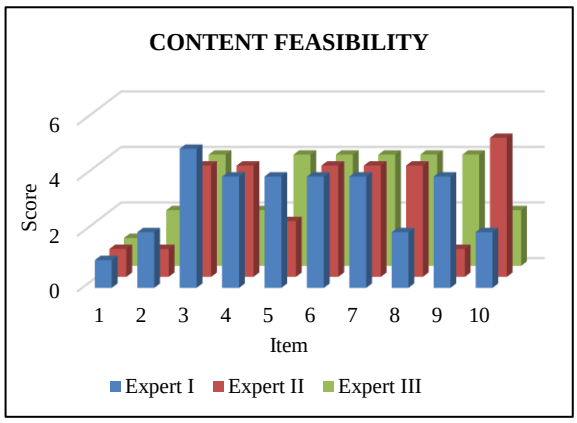


Figure 7. Content Feasibility

The feasibility of concreate construction content in general is less category. In items number 1, 2, 9 and 10, the experts give a low score. It is caused, first the teaching materials do not include basic competencies and the explanations of the contents of the teaching materials are difficult to understand. Second, the concrete construction teaching materials still use concrete SNI 2847-2002.

When compared with the SNI used currently using SNI 2847-2013, one of the differences in SNI for concrete and steel in 2002 with 2013 is that the effective height of beams that exceed 0.9m must be paired with longitudinal reinforcement, whereas in SNI 2847-2013 the high beam more than 0.4m must be paired with longitudinal reinforcement.

The completeness feasibility teaching material concreate construction get very little category, it can bee seen in figure 8.

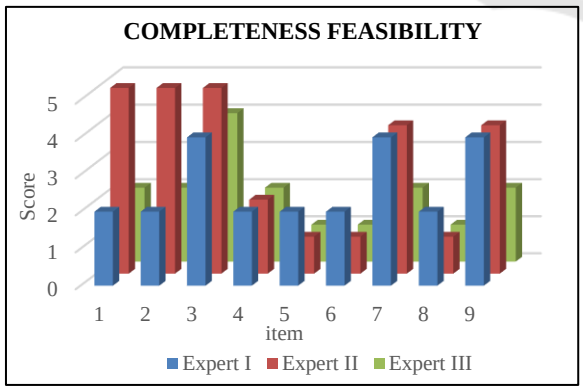


Figure 8. Completeness Feasibility

The completeness feasibility teaching material concreate construction in item 4, 5, 6, and 8 the teaching material not have examples of questions, exercises, key answers, and conclusions. The language feasibility the teaching materials concreate construction can be seen in figure 9.

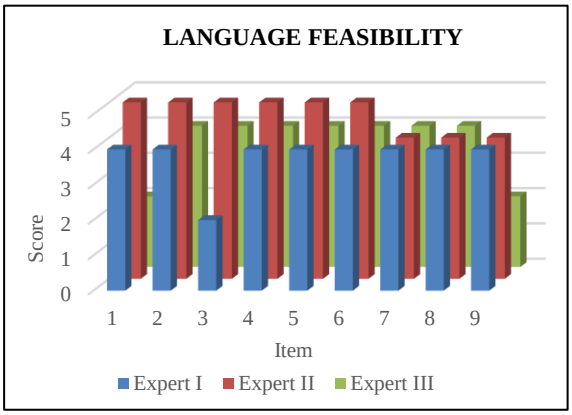


Figure 9: Language feasibility

The language feasibility of the concreate construction teaching materials in general is in good category, but items no. 1, 3 and 9, teaching materials are less effective, and less appropriate to the level of teaching materials users.

The graphic feasibility of teaching material concreate construction can see in figure 10.

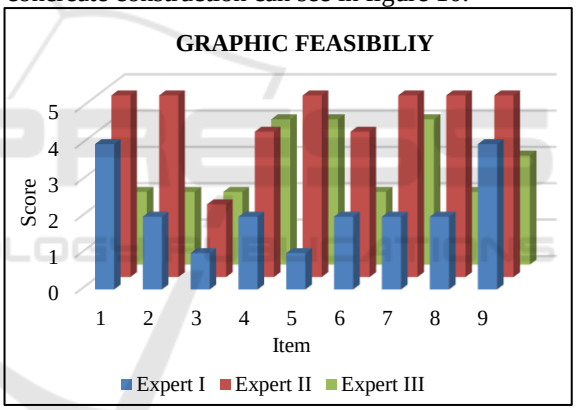


Figure 10: Graphic Feasibility

Items 3, 4, and 6 graphic feasibility teaching material concreate construction are less categorize, this is due to the use of color and placement of photos, images, graphics that are inappropriate. In figure 11, example the image in concreate construction not clear.

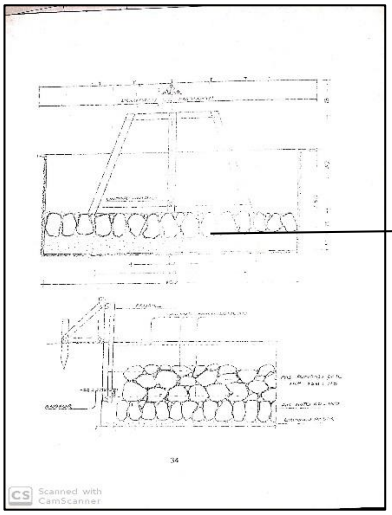


Figure 11: Example Image in Teaching Material Concreate Construction

Based on the results of the Teaching material concreate construction recommended to be used with revisions.

4 CONCLUSIONS

Teaching materials plumbing construction are declared suitable to be used with revisions. Revisions that need to be done are to update the teaching material information, and to reprint teaching materials.

Teaching materials concrete construction are suitable for use with revisions. Concrete construction teaching materials need to use the latest SNI such as SNI 2847-2013. The print quality of concrete construction teaching materials needs to be improved and printed with the best quality.

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