



## CURRICULUM ANALYSIS OF PREREQUISITE COURSE AT INDUSTRIAL FIELD PRACTICE (IFP) (Case Study: Competency Compliance)

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**ABSTRACT:** This study describes the suitability of the competencies that students have through the lectures of the IFP pre-requisites: Project Management, Quantity Surveying and Occupational Safety and Health, with the expected competence of contractors and construction consultants at the time of the IFP. Data collection methods used in this study is to spread the questionnaire to the supervisor where students do the IFP. Then performed data processing to see the Achievement Degrees (AD) of contractor respondents and consultants on the subject curriculum of the prerequisites of IFP. After doing data processing, got AD into category enough. This means that the curriculum in the pre-requisite course of IFP is sufficient to obtain student competence where as the capital to implement the IFP. But to improve the quality of the course curriculum to the good category, it needs some improvement according to the input of the stakeholders.

*Keyword: Industrial Field Practice, Curriculum, Contractor, Consultant*

### 1. INTRODUCTION

At the Department of Civil Engineering to have expertise in the field students are required to carry out Industrial Field Practices (IFP) on construction projects. IFP is one form of application of practical activities in the World Business and Industrial World. Through the IFP is expected to have a match between the material obtained in college with the reality of the world of work in the field. Thus it is expected to occur a strong synergy between education and business world and industry to jointly build quality resources, professional and competent in the field.

In accordance with the curriculum undertaken by students of Diploma of Department of Civil Engineering at Universitas Negeri Padang (UNP), students are required to implement IFP which is managed by Industrial Relations Unit at the engineering faculty. During IFP implementation, students will apply, establish, prove theories obtained on lectures and then practice in real employment, with aspects of preparation, safety, thoroughness and work steps.

At the time of IFP students, lecturers are required to conduct Monitoring and Evaluation (Monev) to the field. Lecturers will consult with the field about the IFP activities undertaken by students and receive input for the smooth program. From

some Monev results, field gained dissatisfaction on IFP students such as: Students are less active and do not participate with activities in the field, students do not understand how to read the shop drawing so having difficulty completing tasks given by the supervisor in the field, students do not understand how to calculate the volume with software because during college still performing manual calculations, lack of knowledge of students about documents related to the project such as contracts, tender documents, lack of knowledge of students on the process of a project, ranging from planning, implementation, supervision process, safety in field and project cost calculation process.

The lack of students who presented at the time of the Monev should not happen because with the passing of the student in the subject of the prerequisite expected the students already have the competence as needed in the field, therefore the author wants to examine: How the content of the curriculum material of the prerequisite subjects IFP student study program diploma of Civil Engineering, engineering faculty, UNP? The objectives of this research are: To get the curriculum of IFP prerequisite subjects in accordance with the competence of in the World Business and Industrial World requirement in civil engineering field.

Higher Education Curriculum through development in 1994, called National Curriculum aimed at National Education Arrangement, at 2000 Core and Institutional Curriculum oriented to global competency, last year 2012 called Higher Education Curriculum oriented on equality of quality / achievement of learning.

In an effort to qualify for university graduates in Indonesia, the government has issued Presidential Regulation no. 08 of 2012 on the Indonesian National Qualification Framework and its Appendices which become the reference in the preparation of graduate learning achievements from every level of education nationally. In line with the educational objectives contained in the Indonesian National Qualification Framework, Industrial Field Practice (IFP) Curriculum which has been listed in the curriculum Diploma of Civil Engineering and Graduate Building Engineering Education UNP is a tool to gain work experience in the framework of recognition of work competence.

IFP is an intra-curricular activity in the group of Expertise Subjects of Diploma and graduate degrees in all departments at UNP. IFP aims to enhance the knowledge, skills and attitudes of students in technology / vocational fields through direct involvement in various activities in the construction industry. Both courses also require the subject of Project Management, Environmental Engineering of Health and Safety, Quantity Surveying for each IFP object to which the student is applying, outside of the special subject depending on the IFP object such as buildings, transportation buildings, and water buildings.

The curriculum and line description - Teaching Program Outline applicable to the Civil Engineering Department regarding the prerequisite courses are:

1. Project Management: This course provides knowledge of the basic concepts of management and organization, project feasibility study, planning stage, tender process, contract types, and project schedules.
2. Environmental Engineering, Occupational Health and Safety ( OHS ) : This course provides knowledge and understanding of OHS construction which includes basic knowledge of OHS, construction OHS regulations, Hazard identification, OHS Management System, OHS type of construction work, emergency response planning.
3. Quantity Surveying (QS): This course provides knowledge of the basic concepts of QS, calculates the Project Budget Plan, project personnel needs and materials, preparation of project reports, quality control of materials and work.

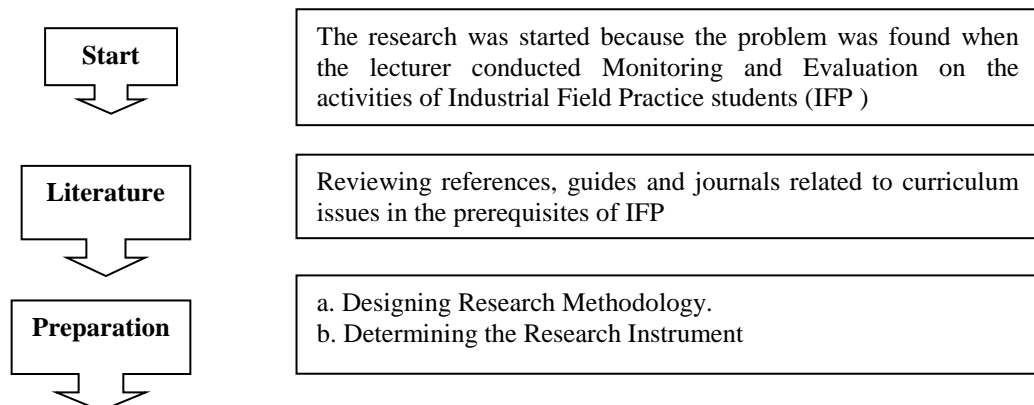
When IFP students, they will work on the ground with stakeholders such as consultants and contractors. Students will be guided by a supervisor who will direct the tasks to the student and upon the end of the IFP, the supervisor will provide an assessment of the student. Stakeholder parties expect the existing competencies in the students are: (Results of interviews with stakeholders in the field):

4. Contractor: Competence in terms of Quantity Surveyor, in terms of implementation in the field, in terms of quality, and in terms of engineering.
5. Consultant: Competence using image software and structural analysis, create and read shop drawings, can calculate the volume (Quantity), create Budget Plan and analyze the strength of structure / material.

## 2. RESEARCH METHODS

This research was conducted in September-October 2017 at construction service company which has accepted IFP student of Department of Civil Engineering Faculty of Engineering UNP.

Stages This study will be illustrated in the scheme as shown in Figure below :



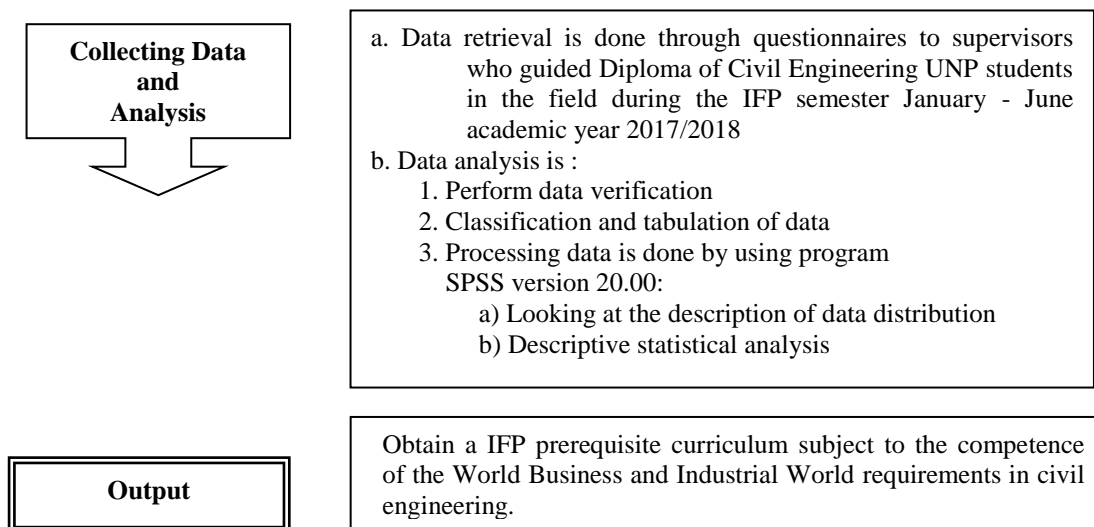


Fig 1. Research Methods

Stages carried out in this research are:

1. **Data Collection**  
At this stage, the researchers collected data on the names of contractor companies and construction service consultants who have received IFP students for the period of January-June 2017 and July-December 2017 of 35 companies.
2. **Validity of respondent questionnaire**  
The process of validity is accompanied by a questionnaire and a direct discussion with experts on improvements that must be made to create a questionnaire. Questionnaire validity regarding the contents and format of the questionnaire to be given to contractor respondents and construction service consultants.
3. **Spreading the questionnaire**  
The questionnaires were distributed to all the sample respondents. Implementation of questionnaire dissemination is given directly to the supervisor of IFP student recruitment construction services. Questionnaire that has been distributed as much as 20 contractor services and 15 consultant services.

Data analysis technique used in this research is descriptive data analysis techniques, that is by describing the validity of the questionnaire given to the construction services company receiver IFP

Civil Engineering Department as well as calculate the degree of achievement obtained from the respondent contractor and construction service consultant.

### 3. RESEARCH RESULTS

#### 3.1. Description of Respondent Data Answer Contractors

Description of the data to be presented here is the data from the results of questionnaires to construction service contractor supervisors who receive IFP students Civil Engineering Department State University of Padang. From the results of questionnaires that have been given to 22 contractors found the following data:

#### Calculation of Frequency Distribution of Response Consultant

$$\begin{aligned} \text{Range} &= \text{max score} - \text{min score} \\ &= 88 - 60 \\ &= 28 \\ \text{Classes} &= 1 + (3,3 * \text{Log}.N) \\ &= 1 + (3,3 * \text{Log}.22) \\ &= 5,42 \sim 5 \\ \text{Class Interval} &= \frac{\text{Range}}{\text{Classes}} \\ &= \frac{28}{5} \\ &= 5,6 \end{aligned}$$

#### 3.1.1. Distribution of Frequency Respondent Contractor

Tabel 1. Distribution of Frequency Respondent Contractor

No	Interval Class	Frequency	%
1	60-64.6	4	18.18
2	64.7-69.3	4	18.18
3	69.4-74	7	31.82
4	74.1-78.7	3	13.64
5	78.8-83.4	3	13.64
6	83.5-88.1	1	4.55
Total		22	100.00

3.1.2. Histogram of Frequency Respondent Contractor

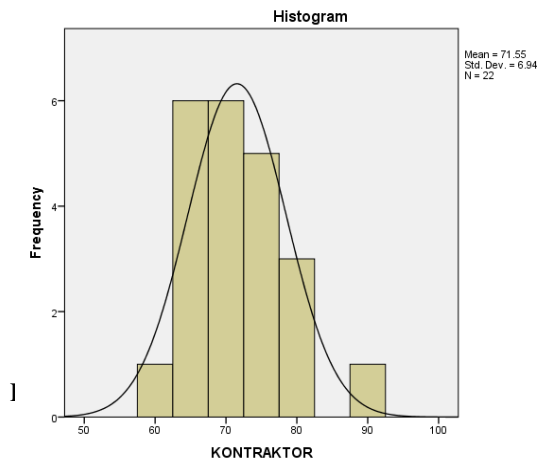


Fig 3. Histogram Distribution Frequency Respondents Contractor

### 3.2. Description of Respondent Data Answer Consultant

From the results of questionnaires that have been given to 15 consultants found the following data:

#### Calculation of Frequency Distribution of Response Consultant

$$\begin{aligned}
 \text{Range} &= \text{max score} - \text{min score} \\
 &= 68 - 44 \\
 &= 24
 \end{aligned}$$

$$\begin{aligned}
 \text{Classes} &= 1 + (3,3 * \text{Log}.N) \\
 &= 1 + (3,3 * \text{Log}.15) \\
 &= 4,88 \sim 5
 \end{aligned}$$

$$\begin{aligned}
 \text{Interval Class} &= \frac{\text{Range}}{\text{Classes}} \\
 &= \frac{24}{5} \\
 &= 4,8 \sim 5
 \end{aligned}$$

3.2.1. Distribution Frequency Respondents Consultant

Tabel 2. Distribution Frequency Respondents Consultant

No	Interval Class	Frequency	%
1	44-48	4	26.67
2	49-53	6	40.00
3	54-58	2	13.33
4	59-63	1	6.67
5	64-68	2	13.33
Total		15	100

3.2.2. Histogram Distribution Frequency Respondents Consultant

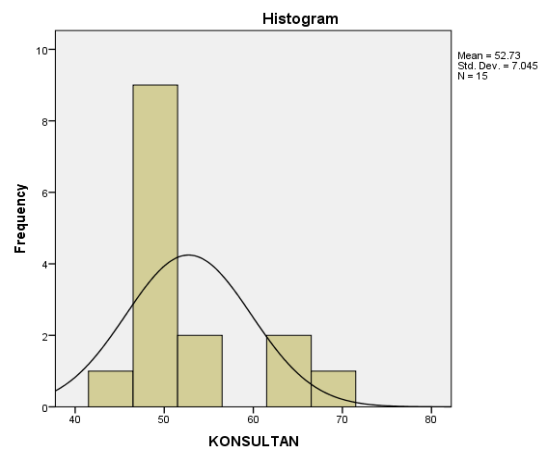


Fig 3. Histogram Distribution Frequency Respondents Consultant

**3.3. Design of Respondent Achievement of Contractors**

*3.3.1. The Degree of Achievement of Respondents' Contractors*

$$DP = \frac{\sum X}{n \times \sum item \times \text{highest scale}} \times 100\% \dots\dots\dots$$

(Syahon Lubis (2011:87))

Tabel 3. Degree of Achievement of Respondents'

No	% Achievement	Category
1	90-100	Very good
2	80-89	Good
3	65-79	Enough
4	55-64	Less
5	0-54	Not good

Syaron Lubis (2011:87)

$$DP = \frac{\sum X}{n \times \sum item \times \text{the highest scale}} \times 100\%$$

$$= \frac{1574}{22 \times 24 \times 4} \times 100\%$$

$$= \frac{1574}{2112} \times 100\%$$

$$= 74,53 \% \text{ (Enough Category)}$$

**Degree of Achievement of each Contractor Respondent Indicator :**

Project Management Course  
 $DP = 645 / (22 \times 10 \times 4) \times 100\% = 73,3\% \text{ (Enough)}$

Quantity Surveying Course  
 $DP = 594 / (22 \times 9 \times 4) \times 100\% = 75\% \text{ (Enough)}$

Occupational Health and Safety Course  
 $DP = 304 / (22 \times 5 \times 4) \times 100\% = 69\% \text{ (Enough)}$

Tabel 4 Degree of Achievement of each Contractor Respondent Indicator

No	Indikator	DA (%)	Category
1	Project Management Course	73,3	Enough
2	Quantity Surveying Course	75	Enough
3	Occupational Health and Safety Course	69	Enough

**3.3.2. The Degree of Achievement of Respondents' Consultant**

$$DP = \frac{\sum X}{n \times \sum item \times \text{highest scale}} \times 100\% \dots\dots\dots$$

(Syahon Lubis (2011:87))

Tabel 3. Degree of Achievement of Respondents'

No	% Achievement	Category
1	90-100	Very good
2	80-89	Good
3	65-79	Enough
4	55-64	Less
5	0-54	Not good

Syaron Lubis (2011:87)

$$DP = \frac{\sum X}{n \times \sum item \times \text{highest scale}} \times 100\%$$

$$= \frac{791}{15 \times 17 \times 4} \times 100\%$$

$$= \frac{791}{1020} \times 100\%$$

$$= 77,5 \% \text{ (Enough Category)}$$

**Degree of Achievement of each Consultant Respondent Indicator**

Project Management Course  
 $DP = \frac{572}{15 \times 12 \times 4} \times 100\% = 79,4\% \text{ (Enough)}$

Quantity Surveying Course  
 $DP = \frac{219}{15 \times 5 \times 4} \times 100\% = 73\% \text{ (Enough)}$

Tabel 4. Degree of Achievement of each Consultant Respondent Indicator

No	Indikator	DA (%)	Category
1	Project Management Course	79,4	Enough
2	Quantity Surveying Course	73	Enough

#### 4. DISCUSSION

From the results of the study, the IFP's prerequisite curriculum is Project Management, Occupational Health and Safety (OHS) and Quantity Surveying ( QS ) is sufficient, meaning that the curriculum in the IFP prerequisite course is sufficient to gain student competence as a

capital to implement IFP. But to improve the quality of the course curriculum needs some improvement to get a better curriculum. Of the 35 questionnaires distributed to the supervisors of the IFP contractor and consultant consultants, the authors get input:

Tabel 5. Input From Stakeholders

NO	COURSES	INPUT FROM STAKEHOLDER
1.	Project Management	<p>1. . Innovative and creative thinking in the application implementation and be a good work methods planner</p> <p>2. Use of Microsoft Software Project should be more proficient because the field is required to manufacture Schedule execution quickly and precisely</p>
2.	Quantity Surveying (QS)	<p>1. The ability to read shop drawing in the field very necessary in the implementation of planning</p> <p>2. Skills in the use of image software AUTOCAD and SAP 2000 structural analysis software must be prospered</p> <p>3. Knowledge and Proficiency of Report Preparation . projects (daily, weekly, monthly) should be further improved.</p>
3.	Occupational Health and Safety ( OHS )	<p>1. Understanding the importance of Personal Protective Equipment greatly necessary to avoid accidents in the field</p> <p>2. Understanding Emergency Response System in more projects so that students are responsive if they occur unforeseen dangers such as force majeure</p>

#### 5. CONCLUSION

The conclusion of the research, the IFP's prerequisite curriculum is enough category, meaning that the curriculum in the IFP prerequisite course is sufficient to gain student competence as a capital to implement IFP. But to improve the quality of the course curriculum needs some improvement to get a better curriculum

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Henny Yustisia is a lecture in Civil Engineering Department, UNP. She obtained her ST and MT from Civil Engineering , Andalas University, Indonesia. Her research interest in education science like learning methods and Industrial Field Practice. In civil Engineering science, her interested

#### 7. AUTHOR'S CONTRIBUTIONS

Henny Yustisia ST., MT : Conception, design, acquisition, and drafting the article. Fitra Rifwan S.Pd.,MT and Laras Oktavia S.Pd., M.PdT : acquisition, analysis and interpretation of data.

#### 8. ETHICS

Article is original and contains unpublished material. The corresponding author confirms that all of the other authors have read and approved the manuscript and no ethical issues involved.

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