Needs analysis pedagogy project management of technology and vocational educational with the approach of project base learning in higher education

M Giatman¹, I N Nafsiah¹, F Rizal¹, A Leonardo¹

¹Fakultas Teknik, Universitas Negeri Padang, Indonesia

Abstract. This research aims to analyze the needs of the pedagogy on the project management courses in building engineering education State University of Padang. This needs analysis look deeply the importance of project management courses in building engineering education from the aspect of the curriculum, pedagogy and learning materials based on current conditions, standard processes and priorities in learning. This type of descriptive study with survey method. With the spread of data gathering techniques questionnaires and interviews. Sample student research educator and lecturer of building engineering. Data analysis techniques was kuantitatif and interviews. Based on the results of the analysis it can be concluded that (1) there is a gap between the needs of the students and professors against the learning model of project management related methods, approaches, learning materials, assessment and evaluation of student learning (2) requires the development of a learning model that supports and meningkatakan knowledge, skills and attitudes.

1. Introduction

The infrastructure of roads, bridges, airports, ports, reservoirs, the port is a driving force for nation’s economic progress (Warsilan, 2015). Therefore in the year 2018 the Government budget improving the infrastructure in the field of Rp 410.4 billion (Kompas.com). The success of the construction of the infrastructur depends on the aspect of implementation of time and cost management that manage by project management (Ismael& Junaidi. 2014). The purpose of project management is to determine which methods, how to implement the project, resources are retrieved and safety (Wulfram, 2007). The management of the Mini Sky City implementation finished only 19 days, 15 days and ark hotel shanghai wold expo was able to build a six-floor building just in one day is an example of the success of proper project management (Rhenalal Kasali, 2016). The successful of management of project management need qualified human resources. Human resources quality is someone who has the ability to work, think, be creative, and have the potential to achieve the planning goals (Ismaulian & Suryani, 2019). The ability to think, could be established in the educational process. Education building engineering as part of technology education and training (TVET) produsing of bachelor of education in the field of civil engineering for the prospective teachers at Vocational secondary schools, instructors of the job training center in industrial/ business world, the Executor and supervisor in the construct and creating contruction service entrepreneurship field should be able to meet the demands of the field workforce. 21st century learning provide an alignment between the world of work/industry with the world of education. 21st century learning that requires students to have the skills of critical thinking and problem solving, collaboration and leadership, agility and adaptability, initiative and spirited entrepreneur, capable of communicating effectively, being able to access and analyze information and have a sense of wonder (Wigner, 2010) and learning 21st century require a lecturer making learning relevant to the big picture, teaching discipline, developing thinking ability, encourage
the transfer of learning, teaching Metacognition, correcting misconceptions directly, teaching team work, utilizing information technology and enhance the creativity of learners (and 10 January 2007 Opfer, 2012). The role of the lecturer in developing student’s knowledge has been regulated by the Constitution of year 2005 No. 14 article 10, the four competencies namely competence of pedagogical, professional competence, social competence and the personality competence. Pedagogy Competence is the ability of a lecturer to implement learning programme in accordance with the design, methods and learning objectives (Muhammad Arifin & Acmad Muhajir, 2019). Teacher’s Pedagogy Competence is influence on motivation and learning achievements of students (Dody & Erny, 2014). Based on the progress of science and technology in the field of construction and the demands of lecturer pedagogical competencies in 21st century learning, the purpose of research is to find out whether there is a gap in needs between project management students and learning models related to methods, approaches, teaching materials, assessment and evaluation and whether students need the development of learning models that enhance knowledge, skills and attitudes.

2. Research Method
This type of descriptive study with survey method. The technique of data collection with the spread of kuensior and interviews. This research was conducted at the technical education Building FT-UNP Even Semester January-June 2018/2019.
The total of population in this research are 85 students using total sampling. Data analysis techniques was kuantitif and interviews. The research instruments were developed that have tested the validity and realibility to 30 students of engineering education Building FT-UNP academic year June-December 2017/2018. Test data analysis using SPSS tried in descriptive statistics.

| Hasil Evaluasi | Responden | Valid | Reabilitas |
|----------------|------------|-------|------------|
| 30 mahasiswa   | All valid  | 0.945 |

3. Results and Discussion

Figure 1. The Results of the Needs Analysis

Indicator research was elaborated in accordance with UU 16-year 2007 with 10 core competencies lecturer in developing courses i.e:
- mastering in characteristics of learners from the physical aspects, moral, social, culture, emotional, and intellectual
- Mastering learning theory and educational learning principles
- Developing a curriculum related to the development of teaching
- Organizing educational development
- Communicating effectively, empathetically and politely with learners
- Organizing the assessment and evaluating of the process and learning outcomes
- Utilizing the results of the assessment and evaluation for the importance of learning
- Reflecting the action to improve the quality of learning
- Using information and communication technologies for the benefit of the organization of educational development
- Facilitating the development of student potentials to actualize various potentials

3.1. Current Needs Analysis Results

Based on the appraisal conducted by the student against the competence of pedagogy courses of project management conditions is not good because the average value obtained from all indicators is 2.0. The result of the this study illustrate that the lecturer has not read the characteristics of students therefore that it influences the provision of facilitating the development of students. On the indicators of Mastering the theory and principles of learning that educates, Developing a curriculum related to the development of teaching, Organizing educational development, Communicating effectively, Organizing the assessment and evaluating of the process and learning outcomes, Utilizing the results of the assessment and evaluation for the importance of learning, Reflecting the action to improve the quality of learning Using information and communication technologies for the benefit of the organization of educational development, facilitating the development of student potentials to actualize various potentials is aspects implementation in the process of learning that greatly affect learning outcome of students.

The results of observation reinforce that the use of learning models, learning resources, learning methods, learning evaluations and evaluations has not varied, so it is only natural that lecturers have difficulty implementing and facilitating students in the project management learning process. while the achievements of graduates of learning are very dependent on the process of curriculum development, learning models used, learning resources and the development of assessment instruments and evaluation of the results of student activities.

3.2. The results of the needs analysis of priorities in Learning

Based on the current priority needs analysis on indicators 3, 4, 5, 6, 8, 9 and 10 with an average rating of 4.2 in the category of very require the development and innovation. Indicators 1, 2 and 7 are in dire need of change inaugural learning process. The results of this research were reinforced by interviews that the authors did to that professors do not have enough time to develop a model of learning that ties with learning strategies, learning resources, learning methods and evaluation learning.

3.3. Discussion

Referring to the results of the study, the demands of 21st century learning and current Condition illustrates that professors need the encouragement to develope a learning process. Competence of pedagogy Professor became a competence strategy and the estuary of the professional academic, social competence and personality. When the professors designed the carrying out and evaluating learning will portray the figure of a professional lecturer. According to CITES Kemp "the design and development proces is a continuous cycle that requires constant planning, design, development and just my assessment to insure effective instruction. The model is systematic and nonlinear andd seems to encourage designners to work in all areas the U.S. is appropriate ". A professor develope instructional programs to built Mastery Learning resulting in pedagogy. Effective learning according to 21st century learning is designed at the push of a digital competence focuses on the creativity and performance of learners, strategies for meta-learning, inductive and learnings model and creative.
problem solving, preparation of learning content and form collaborative knowledge, horizontal learning (peer to peer) McLoughlin and Lee (2008). I Wayan R (2019) describes a Model of 21st century learning centers to learners, with a scientific approach that is a Model of discovery, learning, project-based learning Model, model-based learning and problem-based learning model bleand design and learning. Nicholas (2013) confirms the principle of 21st century learning, namely instruction should be student centered, education should be collaborative, learning should have context and School should be integrated with society. Century learning development is not limited by time and space so that it takes the right kind of learning media. 21st century learning media such as the use of ICT (Agus Ramdani, dkk 2019). That is supported by means of learning with strategis questions .Mobile technologists and utilizing social media as a support, facilitate, increase and improve the learning process (Siti Z, 2016). Lecturer as evaluators must be able to measure the ability of high-level thinking educators by developing formative assessment because it can diagnose learning gaps so that analyze error learners towards knowledge and skills. Formative assessment will provide evaluation guidelines to learners with lecturer thus increasing the ability of Metacognition and knowing how to learning the right way.

4. Conclusion
Based on the results of the analysis and discussion of the results of the study can be summed up thus:
(1) there is a gap between the needs of the students and professors against the learning model of project management related methods, approaches, learning materials, assessment and evaluation of learning; (2) Students need the development of learning models that support and enhance knowledge, skills and attitudes in accordance with the demands of developing science and technology.

References
[1] Warsilan. (2015). Perana Infrastruktur terhadap pertumbuhan Ekonomi dan Implikasi pada kebijakan Pembangunan di Kota Samirinda. Jurnal Ekonomi Universitas Mulawarman Samarinda, Vol.31, No 2, Desember 2015
[2] Kompas.com
[3] Ismael, I., & Junaidi, J. (2014). Identifikasi Faktor-Faktor yang Mempengaruhi Keterlambatan Pelaksanaan Pekerjaan pada Proyek Pembangunan Gedung di Kota Bukittinggi. Jurnal Momentum, 16(1).
[4] Ervianto, B. Wulfram, 2007. Explorasi Teknologi dalam Proyek Konstruksi; Beton Pracetak dan Bekisting, Yogyakarta.
[5] Rhenalal Kasali, 2016. Today is Tomorrow. Jakarta: Milai
[6] Ismaulian & Suryani. 2019. Pengaruh Kualitas SDM dan Infrastruktur Terhadap Perteumbuhan Investasi di Galeri Invertasi BEI FEBI IAIN Lhokseumawe. JRMB, Vol. 4, No. 1:31-36
[7] Wigner T. 2010. Overcoming The Global achievement Gap (online). Cambrige, Mass., Havard University
[8] Saavendra A. and Opfer, V. 2012. Teaching and Learning 21 th Century Skill. Lesson from Learning Sciences. A Global Cities Education Network Report. New York, Asia Society
[9] Muhammad Arifin & Acmad Muhajir. 2019. Analisis Persepsi Mahasiswa Atas Kompetensi Pedagogi Dosen Pendidikan Agama Islam. KAluni. Volum 2
[10] McLoughlin, C and dan Lee, M. J. W (2008). The Thee p’s pedagogyfor the networked society: personalization, participation, and productivity. Internasional Jounal of Teaching and learning in higher Education, Vol. 20. No 1
[11] I Wayan R .2019. Mengembangkan Keterampilan Abad ke 21 Dalam Pembelajaran Kimia. Jurnal Inovasi Pendidikan Kimia, Vol 13, No 1, 2019
[12] Nicholas, J. 2013. 4 essential Rules of 21st Century Learning. Online http://www.teachthought.com/learning/4-essential-rules-of-21st-century-learning/ Diakses Maret 2019
[13] Agus Ramdani, dkk 2019. Pengembangan alat Evaluasi Pembelajaran IPA yang Mendukung Keterampilan Abad 21. JPPIPA. Volume 2, Nomor 1
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