

ISBN : 978-602-1178-11-9

Bukittinggi, October 16-17, 2015

PROCEEDINGS

3rd International Conference on Technical and Vocational Education and Training (TVET)

Theme :

Technical and Vocational Education and
Training for Sustainable Societies



PENERBITAN & PERCETAKAN UNP PRESS
Jln. Prof Hamka Air Tawar Padang,
Telp. (0751) 7051260, 7055689 Fax (0751) 7055628



Penerbitan & Percetakan

UNP PRESS

UNIVERSITAS NEGERI PADANG



FOREWORDS

This proceeding aims to disseminate valuable ideas and issues based on research or literature review in the field of vocational, technical and engineering studies, which have been presented in 3rd International Conference on TVET. This conference has taken place in Rocky Hotel Bukittinggi West Sumatra, October 16 and 17, 2015.

The theme of Conference focused on the perspective of technical and vocational education and training for sustainable society to face the challenges of 21st century, globalization era, and particularly Asian Economic Community. To overcome the challenges, we need the innovation and change in human resources development. Vocational and technical education and training have essential roles to change the world of education and work in order to establish sustainable society.

Undoubtedly, TVET need to enhance the quality of learning by developing various model of active learning, including learning in the workplace and entrepreneurship. Create innovation and applied engineering as well as information technology. Improvement of management and leadership in TVET Institution, and development of vocational and technical teacher education.

Many ideas and research findings have been shared and discussed in the seminar, more than 70 papers have been collected and selected through scholars, scientists, technologist, and engineers' .as well as teachers, professors, and post graduates students who participated in the conference.

Five keynote speakers have taken apart in the conference, namely Prof. D. Stein Ph.D (Ohio State University-USA), Prof. Yusuke Ono (Tottori University- Japan), and Prof. Nashruddin A. Rahim Ph.D (University of Malaya, Malaysia), and Prof. dr. Ali Gufron Ph.D (Directorate General of Human Resources Development in Higher Education-Indonesia), and Syahril Ph.D (Dean of Faculty Engineering UNP-Padang). They all have a great contribution for the success of the conference.

Finally, thank a million for all participants of the conference who supported the success of 3rd International conference on TVET 2015. and most importantly, our gratitude to all scholars who support and tolerated our mistake during the conference.

Padang, 9 Oktober 2015

Prof. Dr. Nizwardi Jalinus, M.Ed
Chair of Scientific Committee

Table Of Contents

1. PostgreSQL, A Platform for Multiple Sources Data Retrieval, Abdul Yadi	1
2. Information Retrieval System For Research Abstract Using Genetic Algorithm With Jaccard Similarity Factor Elin Haerani, Rubanam	9
3. Addie Model Approach Through The Task Learning Course Of Knowledge In Textile Clothing Depateman Procedures State University Educational Field Dina Ampera.....	16
4. Role Of Information Technology In Education Entrepreneurship In Higher Education, Gunawan Ali, Wulan Andang Purnomo, Wahyu Prima	22
5. Development Media Study Of Natural Culture Minangkabau With Kim Arga Budaya.....	26
6. Improving Quality Community-Based Education Zonny Amanda Putra.....	33
7. Study Of Student Learning Activities On The Subject Of Physics Using Cooperative Learning In State 3 Of Senior High Schools In Bungo Despita, Agus Suparno.....	39
8. The Role Of Locus Control And Learning Styles In The Development Of The Blended Learning Model At UNP Z. Mawardi Effendi, Hansi Effendi, Hastria Effendi	43
9. Learning Outcomes In Vocational Education: A Business Plan Development By Production-Based Learning Model Approach Indrati Kusumaningrum, Hendra Hidayat, Ganefri, Sartika Anori, Mega Silfia Dewy	49
10. Effect Of Social Network Of Adolescent Learning Behaviour Ikhwansyah.....	62
11. Implementation Of Media Interactive Learning Based Wlan Technology (Study At SMK Kampar) Kori Cahyono	68
12. Model Development Work-Based Learning The Course Of Blasting Mining Engineering Department Murad	73
13. Professional Development Of Vocational Teachers Padang Through Advanced Education And Training Ramli.....	82
14. Intelligent System Design "QAIS" Based On Artificial Intelligence At The University Of Muhammadiyah Riau LPMI Resmi Darni	90
15. Geographic Information System Design Shortest Route Location-Based Health Care Android Rice Novita, Welita	95
16. Implementation Of Green Productivity To Increase Productivity And Environmental Performance (Case Study At Sme Bowo) Riko Ervil, Nesky Luciana	101
17. Strategy Implementation Of Supervision In Vocational High School In Bungo, Jambi Sayuti Hamzan, Eman Tu Ferli	105
18. Learning Of Crystal Symmetry By Using 3Ds Max Software Fadhilah	109
19. Computer-Based Learning Media Development In Vocational High School	

Baharuddin, Indra Dauly	115
20. Development Of Blended Learning Model In Human-Computer Interaction At University Faiza Rini, Ari Saiful Arifin Rahman	120
21. Online Tracer Study Of Bung Hatta University Karmila Suryani, Khairudin	127
22. Identifying Initial Damage Of Palm Oil Screw Press Of Drive Shaft Purwo Subekti, Eddy Elfiano, Legisnal Hakim	134
23. Weather Stations Prototype To Flood Detection In High Rainfall Area Yulastri, Era Madona, Lifwarda, Anggara Nasution	139
24. An Evaluation Of Electricity Construction Service Industrial Needs-Based Electrical Installer Sukardi, M. Giatman	143
25. System Management Development Universal Intermediate Education Towards Compulsory 12 Years Muhammad Sahnun, Daswarman	155
26. English Specific Purposes, Elda Martha Suri	164
27. Need Assessment By Nominal Group Technique Student Learning Programme Syafiatun Siregar	167
28. Vocational And Technical Teachers Educations Ungsi, AOM	172
29. Analysis Of Vocational Learning System In Department Of Education Building Technique Kinanti Wijaya, Asri Lubis	175
30. Learning Based On Student Thinking Dedy Irfan	180
31. Teaching And Learning Through The Virtual Laboratory Aswardi	186
32. Reforming Fishery Study Expertise Program Of Vocational High Schools (VHSS) Adapted To New Paradigm Of Fishery Resorces Management Asahan Pasaribu	190
33. Application Information System Rental Facilities At The Universitas Lancang Kuningbased Online Nurliana Nasution, Mhd. Arief Hasan, Yummastian	198
34. An Improving Of The Soft Skills And Hard Skill Abilities For Vocational High Schools Students In Learning Process On Service Production Units Adi Sutopo	202
35. Biometric Application For Eyeiris's detection Based Artificial Neural Network Using Discrete Hopfield Algorithm Dicky Nofriansyah, Haryadi, Amrizal	207
36. The Effect Of Instructional Drill And Practice Method And Low Self-Efficacy Toward Fashion Drawing Achievement At SMK Negeri Medan Farihah	214
37. Study Of Ground Water Contamination By Leachate Around Air Dingin Landfill Padang Yaumal Arbi, Tri Padmi Damanhuri, Idris Maxdoni Kamil	218
38. Service Excellence Competence Enhancement For Students Of Finance And Banking Diploma III Faculty Of Economics Uii To Increase Competitiveness Level To Face Asean Economic Community Aidha Trisanty, Nurfauziah	228
39. Need And Analysis Of Soft Skills For Students Of The Mechanical Engineering Department Of Vocational High School Suryo Hartanto, Syahron Lubis, Fahmi Rizal	234

40. Environment Influence Toward Operational Performance In Handcraft Central Industry Silungkang Village Sawahlunto Rasidah Nasrah	239
41. Optimizing The Personal Website Of The Publication Educator By Applying UML Erdisna, Muhammad Ikhlas	242
42. An Evaluation Study On The Effectiveness Of Evacuation Routes Utilization In The Tsunami Potential Area At Padang City Fitra Rifwan.....	248
43. Needs Analysis Of English For Mechanical Engineering Students Martini	254
44. Characteristics Of The Permeability Coefficient (K) At The Regional Flood Inundation Often In Padang Totoh Andayono, Fitra Rifwan.....	258
45. Pengembangan Model E-Learning Dan E-Assessment Berorientasi Problem Based Learning Pada Mata Pelajaran ‘Memelihara Transmisi’ Pada Kelas XI Kompetensi Keahlian Teknik Kendaraan Ringan-SMK Di Sentra Pendidikan BLPT Padang Wakhinuddin	262
46. Modeling Unified Modeling Language (Uml) For The Implementation Of E-Community Alumni (Case Study In Graduate Program Upi “YPTK” Padang) Febriyanno Suryana, Masriadi, Eryunizon	273
47. Evaluation Program Work Practice Industry (Prakerin) In The Era Centralized Vocational Education In The West Sumatra Using Model CIPPO, Ambiyar	278
48. The Need Analysis For The Design Of The Entrepreneurship Product-Oriented Graphical Design Interactive CD Of The Students Of SMK Of Dharmasraya Regency Kasman Rukun, Asrul Huda, Yeka Hendriyani	286
49. Transient Response Study on Transformer Windings Under Impulse Voltage Stresses Hendri Masdi, Rusnardi Rahmat.....	291
50. Design Of Portal Door In Vehicles Parking System Using Programmable Logic Device (PLD) Technology Muhammad Irmansyah, Era Madona, Amelia Yolanda, Ratna Dewi	296
51. Ground Motion Characteristics In Padang, Indonesia Rusnardi Rahmat, Hendri, Syahr, Henry Yustisia	300



NEED AND ANALYSIS OF SOFT SKILLS FOR STUDENTS OF THE MECHANICAL ENGINEERING DEPARTMENT OF VOCATIONAL HIGH SCHOOL

Suryo Hartanto¹, Syahron Lubis² and Fahmi Rizal³

¹Faculty of Engineering, Padang State University, Indonesia

^{2,3} Padang State University, Indonesia

ABSTRACT: The preliminary of the research toward the soft skills of graduated students from vocational high school that took mechanical as their major are not optimal at work place. It could be proven and interaction that did by graduated students from mechanical engineering at work.. This research had purpose to know specific soft skill that need to be taught to mechanical engineering students at vocational school.. Dacum Approach was used in this research. The sample of this research was 50 industry practitioner who have specification in mechanical engineering, vocational school's teachers who teach mechanical engineering and expert in soft skill field. Based on the analysis of the questionnaire that consist of 27 items, with the categories of items; very important, important, not important and very unimportant, it could be concluded that 67% sample said that soft skills very important, 31% important and 2 % not important. The result of this research could be used to be a reference for developing a soft skill learning models for mechanical engineering students at vocation school.

Keywords: Need and analysis, soft skills

1. INTRODUCTION

Effective and efficient performance in the industrial world not only determined by the technical skills or hard skills, but soft skills also gives a great influence. *Research on predicting the future career success of students supports employers' opinions that some soft skills are a better predictor of a dult success (Salaries, graduation rates, home ownership) than technical skills* [1]. Soft skills has a dominant role in supporting work and career development. Soft skills a important competence that must be owned by the workforce in the face of the work world and career development. *"Appropriate soft skills play an important role in a successful career as well as during social interactions in the society. Also Reviews These skills are highly sought after by employers recruiting fresh graduates"* [2].

Vocational education is an education program that organize directly and related with the individual preparation in face of future work with constantly salary or not, as additional individuals preparation in a career development they needed, in addition to bachelor education or vocational education in similiary level. [3]. Vocational graduates should be lead as graduates are ready for work, smart, has a primary competitive, comparative and strong character as a professional worker, therefore soft skills mastered should be mastered well to be excellent graduates grade quality in face of competition and the work world.

In law No. 20 of 2003, article 15, states that vocational education is an education that prepares students primarily for work in a particular sector. With the vocational schools, labor can be provided with good, however, the level of reserve of employment of vocational school graduates can not be balanced with hard skills and soft skills condition that has by employee of vocational graduates. The indication of the problems that often occur in industry, it cause of soft skills are less than optimal. Based on the beginning survey, in business and industry and vocational education, in August 2013, there many are indications of various problems appear because of the lack of soft skills by employees of vocational graduates. The survey results show: a). There is an increased customer claim on product in 4 years, PT. NBI, claims this is because the mixture of garbage into the product which sent to the customer, although the clearly company mentions the existence of rules and availability throw garbage into the trash, but still there are violation. b). At the PT. IN, PT. SO and PT. TV, PT.WB, soft skills indications is not optimal with a responsibilities and duties, the low achievement of work targets, low desire to learn self development and career, lost time high caused human error, lack of work discipline, lack of understanding Safety, not independent, less integrated and low work ethic to the company and then less of careful on work.

Fig 1. Lost time machine C and C PT.TV

There are some weakness workers from vocational graduates which are in rank and career be at lowest. Weakness career and the equality is reinforced with a system of government that equate between high school and vocational school graduates in same level they jobs. This is illustrated through KKNi (Qualifications Framework National Indonesian), which is strangeness by presidential regulation in 2012. KKNi Number.8 is stage frame works of competence qualification which can, equalizes, and integrate the fields of education then job training and work experience to award the recognition of competence working appropriate with working structure in all sectors.

The next survey apply to vocational school teacher, in the Department of Mechanical Engineering, obtained information, that has not been done toward implementation of specific teaching soft skills Mechanical Engineering, both in school practice or practice in the field. Learning process for machining are still based on hard skills to operation of the machine. Performance of the student in of working practices show that most of the students have not been able to work efficiently, effectively, oriented to quality standards or show poor of work ethic. Essentially in developing soft skills learning should be directly integrated with the work process that will build the experience of hard skills and soft skills in the learning process, *"Vocational education is education for work. In order to reach this aim, instructional strategies used should be directed to all requirements needed in the work place. The students should learn the knowledge, skills, attitudes, and values the which*

are important in doing A Certain job in such a way as they apply them in the real work setting ". [4]. The learners should be equipped with knowledge, skills, attitudes and values required in the real environment working. Soft skills is an ability possessed by each individual, which cannot be seen, but soft skills a ability contribute in a person's life, which strongly support capabilities, careers and work someone. Soft skills are related about emotional quotient, personality attitude, social relationships, communication, language, personal habits, friendliness, and special characteristics in developing relationships with others. "Soft skills are character traits, attitudes, and behaviors-rather than knowledge or technical aptitude. Soft skills are the intangible, nontechnical, personality-specific skills that determine one's strengths as a leader, facilitator, mediator, and negotiator ". [5].

In education, learning should be implemented with a balance between hard skills and soft skills, this is a important action, *Soft skills are as important as cognitive skills. [5].* In the work world and industry, Soft skills is invisible foundation must have each individual, but the effects can be seen directly. Mastering individuals soft skills to entire business and industry in the future will be needed, that incompliance in the statement, *"the future of the occupational structure in the Industrialized world is to Eliminate more and more such unskilled jobs and to put an increasing premium on higher levels of reading, computation, communication, and problem solving or reasoning skills In essence. Learned the skills in school and the skills learned on the jobs will be increasingly seen as complementary and interactive ". [6].* "There are some skills that are specific to needs in industry and manufacturing, the skills need will be very important as defense to face of the information development and the environment rapidly, soft skills, among others, 1). *Skills of problem recognition and definition, 2). Handling evidence, 3). Analytical skills, 4). Skills implementation, 5). Human relations, 6). Learning skills". [6].*

The necessary to know the specific of soft skills in the work world is needed to be able to solve the problems that exist today, the purpose of this study is expected to reveal the scope soft skills company or industry required that must be mastered by the students of Mechanical Engineering Department of Vocational Education.

2. RESEARCH METHOD

The research method is need analysis by using DACUM (Developing a Curriculum) approach. *"Is an internationally Recognized job / occupational analysis, Instant confirmation technique that is used by industry practitioners,*



educators and consultants to Effectively identify the duties, tasks, and related information required for a job / occupation". [7].

Dacum, is analytical technique that is recognized internationally, which is often used by industry practitioners, educators and consultants as the most effective way to identify tasks, works and information related to employment and occupation. This approach explains that in order to get the most effective information must come from the right source. It is obtained from expert worker or have expertise in each fields, where they were able to describe and define their work more accurately and precisely than others.

The sample of the research is 50 respondents consisting of 10 industry practitioners in the field of machining company, Vocational Teachers in the field of machining and experts in the field of training of human resource development in Batam. Riau Islands Province. Find out the response of soft skills needs in Mechanical Engineering Vocational School, used a questionnaire completed by respondents using categories, Very Important, Important, Less Important and Unimportant.

3. RESULT AND DISCUSSION

The results needs analysis of soft skills, be categorized into two parts, namely general soft skills that can be used in the field company's and specific soft skills in the field of machinery. Soft skills needs analysis results as follows:

Table 1. Data description needs analysis

N	Valid	50
	Missing	0
Mean		98,56
Median		99,50
Mode		108
Std. Deviation		8,129
Minimum		80
Maximum		108
Sum		4928

Fig 2. The frequency distribution of data needs analysis

Fig 3. Soft skills respon general categorize

Fig 4. Soft skills respon general categorize

Fig 5. Soft skills respon engineering specific categorize

Fig 6. Soft skills responds engineering specific categorize

Fig 7. Soft skills respon engineering specific categorize

The results of data processing soft skills needs analysis students' Department of Mechanical Engineering, is divided into two parts, namely soft skills commonly used in companies that support the work of machining described in Figure 3 and 4. The type of soft skills in the chart written with sequence numbers 1 through 12. For specifically for machining soft skills depicted in Figure 5 to 7, with the order type of soft skills is indicated by a sequence of numbers 13 through 27. The decision criteria for response on a needs analysis to see the response to the SP category (very important) and P (important).

Soft skills used in the general category in companies and support the work machining consists of 1. Demonstrate a willingness to develop a career, with the percentage of category is very important and important by 68% and 32%, 2. Demonstrate ethics communication in the workplace, 80% and 20% 3. Demonstrate good interpersonal relationships at work, 76% and 24%, 4. Demonstrate good cooperation in employment, 92% and 8%, 5. Demonstrate a high work ethic in work, 78% and 20%, 6 . Featuring action the problem solving in accordance with the rules of employment, 56% and 42%, 7. Maintaining timely attendance, 70% and 30%, 8. Demonstrate high initiative in work, 56% and 42%, 9. Demonstrate honesty in work , 82% and 18%, 10. Comply with all regulations in employment, 64% and 34%, 11. Shows a responsible attitude in each work had done, 84% and 16%, 12. Shows a good adaptation in work, 50% and 46%.

Specification of soft skills required for machining work in work world in appropriate with the results of the analysis in figure 3 to 6, with a very important and important category, described as follows, soft skills No. 13. Trying to observe the work process in accordance with the plans and drawings production design, 68% and 26%, 14. Trying observing to the production quotas determined, 56% and 38%, 15. Demonstrate an attitude to support, care for and maintain the success of the agency / company, 66% and 30%, 16. Motivated to participate in advanced training and learning work processes, 58% and 42%, 17. Demonstrate appropriate planning and operations specification products based on work instructions, 46% and 50%, 18.

Always demonstrating Warming up engine before operation, 44% and 52%, 19. Shows the readiness of equipment before operational, 62% and 36%, 20. Demonstrate checking machine at the first operating units, 64% and 36%, 21. Setting the machine according product specifications, 74% and 26%, 22. demonstrate the correct material handling, 52% and 44%, 23. Demonstrating health and safety at every engine work process, 80% and 18%, 24. Demonstrate caution in operating the machine, 74% and 26%, 25. Demonstrate maintenance and take care of the engine, 66% and 34 %, 26. Demonstrate checking the quality standards of production, 62% and 34%, 27. Demonstrating the engine shut off in sequence base on the procedure, 78% and 20%.

Based on the results of questionnaire analysis soft skills that have been given to 50 sample, showed that 27 items of soft skills on the job machining, all of them elected in the category of very important and important, it showed that soft skills is necessary in the work of industrial or business-related with soft skills that should be possessed by the students of Mechanical Engineering Department of Vocational School

4. CONCLUSION

Based on the need analysis has been applied, with 27 items were selected by the soft skill of respondents categorized as very important 67% important category 31% and remaining of less important and not important is 2% Thus the 27 items soft skills to be owned by the Department of mechanical engineering Vocation School students as one of the competencies required. With have the soft skills, students will expected to have good competence in expertise field to face of work world.

5. REFERENCES

- [1] Pritchard.J. "The Important of Soft Skills in Entry Level Employment and Post Secondary Succes: Perspective from employers and community colleges". 2013. pp. 22
- [2] Majid.S, Liming.Z "Importance of Soft Skills for Education and Career Success". *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)*, Special Issue Volume 2 Issue 2. 2012.
- [3] Calhoun.Calfrey C dan Finch. Alton V. "Vocational Education Concept and Operation". Belmont, California. Wadsworth Publishing Company. 1982. p.60
- [4] Lubis. Syahron. "Concept and Implementation of Vocational Pedagogy In TVET Teacher Education". *Proceedings of the 1stUPI International Conference on Technical and Vocational Education and Training*. Bandung, Indonesia, 10-11 November 2010.
- [5] Robles.M.M. "Executive Perception of the Top 10 Soft Skills Needed in Todays Workplace". *The Association for Business Communication Reprints and permission: <http://www.sagepub.com/journalsPermissions.navDOI:10.1177/1080569912460400> <http://bcq.sagepub.com>. 2012.*
- [6] Herr. E.L dan Cramer. S.R. "Career and counseling through the life span, systematic approaches". Fourth Edition. New York. Harper collins publisher. 1992. pp. 115-116
- [7] Norton.Robert.E.(2004). "The Dacum Curriculum Development Process". *International Vocational Education & Training AssociatioInternational Association 14th IIVETA International TVET Conference Viienna, August 25 -27,2004.*