

PROCEEDINGS
**4th International Conference on Technical
and Vocational Education and Training (TVET)**

Theme:
**Technical and Vocational Education and Training
for Sustainable Societies**

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4th International Conference on Technical and Vocational Education and Training (TVET)

Theme: Technical and Vocational Education and Training for Sustainable Societies

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FOREWORD

Welcome for all respected scholars, researchers, post graduate students and especially Keynote Speakers to the 4 ICTVET. The theme of the conference focus on Technical and Vocational Education and Training for sustainable societies and consist of six subthemes. i.e Development of learning model on TVET, Workplace Learning and entrepreneurship, Innovation on applied engineering and information technology, Management and Leadership on TVET, Vocational and Technical Teachers education, and Assessment and Evaluation on TVET.

Sustainable society should be followed by the improvement of various factors that have impacts to the quality of vocational and technical education and training, particularly to overcome the competitiveness of the world business. As we have already known the rapid change of technology as well as the change of demography, having a great effects to the life of peoples in this world, The competitiveness need a collaborativeness to survive the life of millions peoples who lost their jobs. Young peoples as a productive generation have to be creative and innovative to face the competitiveness. So this proceeding contents consist of various findings of research in the field of vocational and technical education as well as applied technology and mainly based on the subthemes of the conference.

Finally, we would like to thank a million for all participants of this conference and all parties who support the success of this conference. Hopefully the seminars and scientific work of this seminar can be a reference material for basic education and elementary school teacher education in Indonesia.

Padang, July 2, 2018

Tim Editor

CONTENT PROSIDING ICTVET 2017 REPOSITORY UNP

1. THE PROSPECT OF OFFSHORE IRON SAND IN TIRAM BEACH PADANG PARIAMAN REGENCY WEST SUMATERA Adree Octova, Ansosry, Yoszi Mingsi Anaperta and Indah Elok Mukhlisah.....	1-7
2. OPTIMIZE OF LEAST-SQUARE INVERSE CONSTRAIN METHOD OF GEOELECTRICAL RESISTIVITY WENNER-SCHLUMBERGER FOR INVESTIGATION ROCK STRUCTURES IN MALALAK DISTRICTS OF AGAM WEST SUMATRA Akman, Amir Harman, Putra Amali.....	8-13
3. CLUSTER ANALYSIS DISTANCE INTER DISTRICT USING SINGLE LINKAGE METHOD FOR DETERMINATION OF MPLIK CAR OPERATION ZONE IN MEDAN CITY Ali Ikhwan, Yasmin Mohd Yacob, Solly Aryza	14-16
4. EFFECT OF MIND MAPPING LEARNING METHODS ON LEARNING OUTCOMES Almasri	17-21
5. DESIGN OF SKILL ASSESMENT IN COMPUTER NUMERICAL CONTROL PROGRAMMING SUBJECT Ambiyar, Febri Prasetya, Yufrizal.....	22-26
6. MODIFICATION OF INPUT PUSHER ASSEMBLY OF LASER MARKING MACHINE Arif Rahman Hakim	27-34
7. COLLABORATIVE PROJECT-BASED LEARNING: AN INSTRUCTIONAL DESIGN MODEL IN THERMODYNAMICS ON TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET) Arwizet K, Nizwardi Jalinus, Krismadinata.....	35-39
8. DEVELOPMENT OF EMPLOYEE INFORMATION SYSTEM-BASED WEB IN MAN 1 PADANG Asrul Huda, Rendy Harisca.....	40-46
9. DECISION SUPPORT SYSTEM (DSS) WITH WP AND MFEP METHODS IN SELECTION OF BEST BABY CLOTHES Asyahri Hadi Nasyuha, Rahmat Sulaiman Naibaho, Saniman.....	47-53
10. IMPROVING LEARNING MOTIVATION THROUGH IMPLEMENTATION PROBLEM SOLVING LEARNING STRATEGY Budi Syahri, Primawati, Syahrial	54-58
11. THE MODELING OF MASSIVE LIMESTONE USING INDICATOR KRIGING METHOD (CASE STUDIES OF MASSIVE LIMESTONE IN PT SINAR ASIA FORTUNA) Dedi Yulhendra, Yoszi Mingsi Anaperta	59-65
12. ELECTRONIC COMPONENT TESTER AS A LEARNING MEDIA FOR CLASS X STUDENTS AUDIO VIDEO ENGINEERING SMKN 1 SUMBAR Delsina Faiza, Thamrin, Ahmaddul Hadi, Yongki Saputra.....	66-74

13. EFFECTIVENESS OF INTERACTIVE INSTRUCTIONAL MEDIA ON ELECTRICAL CIRCUITS COURSE: THE EFFECTS ON STUDENTS COGNITIVE ABILITIES Doni Tri Putra Yanto, Sukardi, Deno Puyada	75-80
14. EVALUATION OF LEARNING PROCESS USING CIPP MODEL Dwi Sudarno Putra, Misra Dandi Utama, Dedi Setiawan, Remon Lapisa, Ambiyar	81-86
15. IMPLEMENTATION OF CONTEXTUAL TEACHING AND LEARNING ON ANALYZING ELECTRICAL CIRCUITS SUBJECT Dwiprima Elvanny Myori, Citra Dewi, Erita Astrid, Ilham Juliwardi	87-91
16. DOMESTIC EMPLOYMENT PROCESSING SYSTEM ON WORKING PROTECTION AND TRANSMIGRATION USING GEOGRAPHIC INFORMATION SYSTEM (GIS) Eddis Syahputra Pane, Kori Cahyono	92-98
17. CONDUCTING LABOR MARKET ASSESSMENT IN ENGINEERING CURRICULUM DEVELOPMENT Edi Septe, Suryadimal, Wenny Marthiana, Nizwardi Jalinus, Ramli.....	99-105
18. DIFFERENCES IN LEARNING OUTCOMES IN THE PRACTICE OF MICROCONTROLLER SYSTEM USING MCS51 MICROCONTROLLER TRAINER KIT Edidas, Dedy Irfan.....	106-108
19. MICROCONTROLLER SKILL TRAINING FOR SMKN 2 PAYAKUMBUH AND SMKN 1 SUNGAI RUMBAI Edidas, Legiman Slamet and Ilmiyati Rahmy Jasril.....	109-113
20. THE EFFECT OF ISLAMIC WORK ETHICS AND SPRITUAL LEADERSHIP ON EMPLOYEE'S COMMITMEN IN PADANG SHARIA HOTELS Eka Mariyanti, Rasidah Nasrah.....	114-120
21. THE DESIGNING OF THE PROTOTYPE OF THE AIR QUALITY MEASURING HELMET Eko Hariyanto, Solly Ariza Lubis, Zulham Sitorus, M. Iqbal.....	121-124
22. REVIEW DEVELOPING OF PROJECT BASED AS INNOVATION INSTRUCTIONAL Eko Indrawan	125-130
23. IMPROVING THE ESP STUDENTS' VOCABULARY BY USING PICTURES IN CIVIL ENGINEERING STUDY PROGRAM AT FIRST SEMESTER OF EKASAKTI UNIVERSITY PADANG Elda Martha Suri.....	131-133
24. INTEGRATED SERVICES SYSTEMS ELECTRONIC DEVELOPMENT FACULTY OF ENGINEERING PADANG STATE UNIVERSITY BASED ON JAVA DESKTOP Elfi Tasrif, Asrul Huda.....	134-137
25. THE EFFECT OF STRATEGY OF TRAINING MODELS IN LEARNING ELECTRICAL INSTALLATION Elfizon, Syamsuarnis, Oriza Candra.....	138-141

26. SOFTWARE DEVELOPMENT OF CONCENTRATION SELECTION WITH INTEREST TEST BASED ON INTELLIGENT SYSTEM Elin Haerani.....	142-149
27. NEEDS ANALYSIS ON INCREASING COMPETENCY TEST RESULTS STUDENTS IN S1 PROGRAM OF PUBLIC HEALTH SCIENCES STIKES HANG TUAH PEKANBARU Emy Leonita, Nopriadi, Ahmad Satria Efendi, and Niswardi Jalinus	150-155
28. THE READINESS OF STUDENT TO ENTREPRENEUR THROUGH INCORPORATION OF THE PILOT PROJECT PRACTICE Ernawati.....	156-161
29. EFFECT OF PROJECT BASED LEARNING MODEL IN IMPROVING STUDENT LEARNING RESULT Erwinsyah Simanungkalit.....	162-166
30. DESIGNING LEARNING TOOLS BY USING PROBLEM BASED INSTRUCTION (PBI) MODEL ON ENERGY RESOURCE MATERIAL INTEGRATED TO ENERGY SAVING CHARACTER Estuhono.....	167-170
31. THE DESIGN OF LECTURER PERFORMANCE EVALUATION MODEL BASED ON ANALYTIC NETWORK PROCESS (ANP) Fenny Purwani, Niswardi Jalinus, Ambiyar.....	171-175
32. DEVELOPMENT OF ONLINE EXAMINATION SYSTEM USING WONDERSHARE QUIZCREATOR BASED ON WEB Fitri Yanti, Rijal Abdullah, Krismadinata	176-180
33. THE VALIDITY OF TRAINING MATERIALS SCIENCE AND DEVICES SUBJECT AT DEPARTMENT OF ELECTRICAL ENGINEERING Fivia Eliza, Dwiprima Elvanny Myor, Hastuti.....	181-185
34. TRAINING MODEL-BASED KNOWLEDGE MANAGEMENT SYSTEM FOR VOCATIONAL HIGH SCHOOL TEACHERS SKILLS ENGINEERING COMPUTER NETWORK Gunawan Ali, Kasman Rukun, Syahril	186-193
35. FUZZY LOGIC BASED CONTROLLER FOR BUCK CONVERTER Habibullah, Irma Husnaini, Asnil.....	194-200
36. A NEW DESIGN OF HANDLESS STIRRED DEVICE Hanne Aulia, Riki Mukhaiyar	201-204
37. ACADEMIC INFORMATION SYSTEM OF STIKES PERINTIS PADANG Harleni, Marisa.....	205-209
38. DESIGN OF ELECTROMAGNETIC REGENERATIVE SHOCK ABSORBER AS A TOOL OF HARVESTING VIBRATION ENERGY ON VEHICLE Hasan Maksum, Aslimeri, Putra Jaya, Wanda Afnison.....	210-213

39. THE EFFECTIVENESS OF USING POSTER AND VIDEO MEDIA IN EDUCATION ABOUT DANGERS OF SMOKING ON KNOWLEDGE AND ATTITUDES OF SENIOR HIGH SCHOOL 12 PEKANBARU STUDENTS Hastuti Marlina, Reno Renaldi	214-217
40. A MODEL PREVENTIVE MAINTENANCE CONTROL IN THE MACHINE TURNING AT WORKSHOP THE FACULTY OF ENGINEERING OF THE STATE UNIVERSITY IN PADANG Hefri Hamid, Nizwardi Jalinus, Syahril, Ambiyar, Febri Prasetya	218-224
41. INVESTIGATION OF CHEMICAL FEASIBILITY AND DISTRIBUTION OF IRON SAND RESERVE REGIONAL AREA OF AGAM DISTRICT FOR CEMENT RAW MATERIAL IN PT. SEMEN PADANG Heri Prabowo, Sumarya.....	225-227
42. THE DEVELOPMENT OF INTERACTIVE MULTIMEDIA-BASED LEARNING MEDIA USING ADOBE FLASH CS3 AND CAMTASIA IN PROBLEM-SOLVING LEARNING IN ELEMENTARY MATHEMATICS OF IN STUDENT PGSD STKIP ADZKIA IN PADANG Ika Parma Dewi, Lativa Mursida, Rizkayeni Marta.....	228-235
43. ART EDUCATION THROUGH FREE EXPRESSION APPRECIATES, DISCIPLINE SCIENCE, AND MULTICULTURAL AS EFFORTS TO IMPROVE STUDENT CREATIVITY Indra Irawan	236-242
44. THE INFLUENCE OF USING ANIMATION MEDIA AND LEARNING MOTIVATION TOWARD LEARNING RESULT OF AUTOMOTIVE STUDENTS IN SMK N 2 PAYAKUMBUH Indra Wahyu, Fahmi Rizal, Rijal Abdullah.....	243-248
45. INFORMATION SYSTEM AND REPORT VALUE PROCESSING BASED MICROSOFT VISUAL BASIC 6.0 ON SENIOR HIGH SCHOOL (CASE STUDY AT SMAN 12 PADANG) Indra Wijaya, Isra Mouludi, Fandy Neta, Yaslinda Lizar, Satria Ami Marta	249-256
46. DESIGN OF SIMULATOR FOR REPLACEMENT OF TOOLS PRACTICE DIGITAL ENGINEERING IN THE VOCATIONAL SCHOOL Irwan Yusti, Ganefri, Ridwan	257-259
47. CELL ROTATION TO RESOLVE THE WEAKEST CELL DAMAGE IN THE BATTERY PACK IN DISCHARGING PROCESS Irwanto Zarma Putra, Citra Dewi	260-263
48. IMPROVEMENT OF CONCRETE QUALITY WITH ADDITION OF SUNUA PASIR PADANG PARIAMAN WEST SUMATRA Iskandar G. Rani, Widya Salmita.....	264-268
49. SIMPLE WATER PURIFIER USING MULTILEVEL SYSTEM Jasman, Nelvi Erizon, Syahrul, Junil Adri, Bulkia Rahim	269-272

50. DESIGN OF LIBRARY INFORMATION SYSTEM USING BARCODE ON SMAN 1 SOLOK CITY Jeprimansyah	273-280
51. THE DESIGN OF THE SIGNAL MEASUREMENT DEVICE OF BODY'S BIOELECTRICAL IMPEDANCE By USING THREE ELECTRODES Juli Sardi, Hastuti, Ali Basrah Pulungan	281-286
52. PATIENT INFORMATION SYSTEM DESIGN ON MATERNITY HOSPITAL RESTU IBU PADANG Jusmita Weriza	287-293
53. IDENTIFICATION THE IMPORTANCE OF LEARNING TOOLS DEVELOPMENT ON ENERGY-EFFICIENT BUILDING INNOVATIONS USING ROOT CAUSE ANALYSIS Kemala Jeumpa	294-297
54. DECISION SUPPORT SYSTEM FOR RECOMENDATION CERTIFICATION TEACHER ON VOCATIONAL HIGH SCHOOL Khairul, Rahmad Budi Utomo.....	298-302
55. IMPACT OF THE TWI LEARNING MODEL IN LEARNING STONE AND CONCRETE CONSTRUCTIONS ON VOCATIONAL EDUCATION Kinanti Wijaya, Daniel IrvansiusTampubolon.....	303-307
56. THE EFFECT OF SOFTWARE MASTERCAME TOWARD MECHANICAL ENGINEERING STUDENTS PERFORMANCE IN MAKING PRODUCT WITH CNC MILLING MACHINE IN VOCATIONAL HIGH SCHOOL 1 PADANG Kms. Muhammad. Avrieldi, Suparno, Nofri Helmi.....	308-310
57. LEARNING BROADCAST VIDEO SYSTEM WITH H264 VIDEO ENCODING RASPBERRY PI Leni Marlina, Aswandi.....	311-315
58. OPTIMIZATION OF EXTERNAL LIGHTNING PROTECTION SYSTEM DESIGN IN BUILDING CENTER FOR INFORMATION TECHNOLOGY AND DATA BASE (PTIPD) UIN SUSKA RIAU Liliana, Afriani, Anwardi	316-322
59. A NEW MODEL MOBILE LEARNING MANAGEMENT SYSTEM BASED ON MOODLE IN UNIVERSITY Lita Sari Muchlis, Kasman Rukun, Krismadinata, Yahfizham	323-327
60. DEVELOPMENT OF MECHANICAL TECHNOLOGY LEARNING MODULE PROGRAM EXPERTISE OF SMK ENGINEERING M. Giatman, Waskito, Maruli Sihombing	328-332
61. SECURITY OF MEDICAL RECORD WITH RIVEST SHAMIR ADLEMAN (RSA) METHOD M.Syaifuddin, Ahmad Fitri Boy, Ali Ikhwan.....	333-336
62. RAHMATAN LIL ALAMIN, THE CONCEPT OF MULTICULTURAL EDUCATION Muh. Barid Nizarudin Wajdi, Achmad Fathoni Rodli	337-340

63. LESSON STUDY FOR IMPROVING A LEARNING QUALITY Muh. Barid Nizarudin Wajdi, Andi Mursidi	341-345
64. THE ROLE OF INFORMATION TECHNOLOGY IN THE IMPROVEMENT OF TEACHER’S COMPETENCIES AND TEACHING LEARNING PROCESS EFFECTIVENESS IN ESA SEJAHTERA SCHOOL PEKANBARU Muhammad Luthfi Hamzah, Hamzah, Astri Ayu Purwati	346-350
65. IMPLEMENTATION OF PROJECT BASED LEARNING MODEL IN COURSE WEB DESIGN Muhammad Sabir Ramadhan, Neni Mulyani, Muhammad Amin.....	351-357
66. MEASUREMENT MODEL OF CONTRIBUTED FACTOR AND INDICATOR TOWARDS VOCATIONAL EDUCATION PRODUCTIVITY Mulianti, Ambiyar, Generousdi and Rodesri Mulyadi	358-364
67. ORNAMENTS ON THE TRADITIONAL ACEHNESE HOUSE IN CENTRAL ACEH, ACEH PROVINCE N Novita, M Mukhirah, R Dewi, Fitriana, F Noer, F Fadillah, E Erni.....	365-368
68. DESIGNING STRATEGY MAPS FOR PRIVATE ENGINEERING COLLEGE Nanang Alamsyah, Larisang, Muhammad Ansyar Bora	369-376
69. DESIGN OF INTERACTIVE MEDIA INTERACTIVE EYE LESSONS FOR CLASS III SD N 04 BARINGIN PADANG CULTURAL CULTURAL FLOOR BASED ON MULTIMEDIA Nelda Azhar, Putra Jaya, Asrul Huda, Etika Fahmidyah	377-383
70. DEVELOPMENT OF MALAY FRUIT ORNAMENT Netty Juliana.....	384-387
71. THE CONTRIBUTIONS OF DISCIPLINE AND ENVIRONMENTAL KNOWLEDGE ON CLEAN BEHAVIOR OF STUDENTS IN PUBLIC ELEMENTARY SCHOOL KAMPUNG BARU PARIAMAN, WEST SUMATERA Nurhasan Syah, Sanny Edinov	388-393
72. ANALYSIS OF VOLUME AND STRONG CONCRETE IMPROVEMENT ON NON- SAND CONCRETE MIXED WITH ADDITION BAKING POWDER Nurmaidah	394-398
73. BRACING CROSS SECTION EFFECT TO DISSIPATION ENERGY BY NUMERICAL ANALYSIS Prima Zola, Rahmat, Fitra Rifwan	399-405
74. DEVELOPMENT OF MODEL OF PROPELLER-CROSS FLOW WATER TURBINE FOR PICO HYDRO POWER GENERATOR TITLE Purwantono, Refdinal, Hendri, Syahrul.....	406-408
75. THE POTENTIAL OF RENEWABLE ENERGY (STUDY CASE IN TOMUAN HOLBUNG VILLAGE, ASAHAN REGENCY OF SUMATERA UTARA PROVINCE) Rahmaniar, Agus Junaidi.....	409-413

76. VIRTUAL LAB IMPLEMENTATION QOS METAROUTER ON COMPUTER NETWORK LEARNING Raimon Efendi.....	414-418
77. BLASTING DESIGN DEVELOPMENT AREA DECLINE CIBITUNG AND CIKONENG UNDERGROUND MINE PT CIBALIUNG SUMBERDAYA BANTEN Raimon Kopa, Afdhal Husnuzan, Bambang Heriya.....	419-423
78. ANALYSIS OF LEARNING COMPETENCY ENGINEERING STUDENTS VOCATION D 3 FT UNP Ramli, Febri Prasetya	424-429
79. FACTORS AFFECTING THE AUTOMOTIVE ENGINEERING STUDENTS' INTEREST ON TEACHING PROFESSION Rasinov Chandra, Anggi Aprianto, Mawardi, Reza Rahmadani.....	430-435
80. AN EXPERIMENTAL STUDY ON THE EFFECT OF CENTRIFUGAL CLUTCH COOLING GROOVE ON MOTORCYCLE PERFORMANCE Remon Lapisa, Hendika Syahputra, Irma Yulia Basri, Rifdarmon, Hendra Dani Saputra	436-440
81. EXPERT MODEL SYSTEM ON ENTREPRENEURSHIP PERSONALITY Resmi Darni, Z. Mawardi Effendi and Selamat Triono.....	441-446
82. THE ANALYZED OF TAR AS WASTE MATERIAL OF BITUMINOUS COAL GASIFICATION BY USING GASCHROMATOGRAPHY Rijal Abdullah and Hengki Ade Satria	447-450
83. EMPLOYEE PRODUCTIVITY IN TWO CROSS CULTURES BASED ENTREPRENEURSHIP Riki Adriadi, Ganefri and Fahmi Rizal	451-455
84. DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD OF INSTRUCTIONAL MEDIA ON BUILDING CONSTRUCTION Rizky Indra Utama, Nurhasan Syah, Rijal Abdullah.....	456-458
85. MULTIMEDIA INTERACTIVE IN WEB PROGRAMMING SUBJECTS Rusli Saputra, Sophan Sophian, Delia Putri.....	459-464
86. PREDICTED VULNERABILITY ASSESSMENT OF NON ENGINEERED HOUSES BASED ON DAMAGE DATA OF THE 2009 PADANG EARTHQUAKE IN PADANG CITY, INDONESIA Rusnardi Rahmat Putra, Junji Kiyono and Aiko Furukawa	465-472
87. TWO SPECIES OF TERMITE DAMAGING TO BUILDING AND HOUSES AT BANDA ACEH (SUMATRA, INDONESIA) S Syauckani, M Bahi, M Muslim, M Shabri Abd Majid, D Sutekad, Y Yasmin, N Novita	473-476
88. PERSONAL MANAGEMENT IN INFORMATION SYSTEMS APPLICATIONS WITH TOGAF FRAMEWORK Safrian Aswati, Saleh Malawat, Suhendra, Iskandar, Yessica Siagian, Arridha Zikra Syah	477-482

89. ANALYZING OF TECHNICAL CUTTING OF EMPTY PALM BUNCHES Safril, Dedi Wardianto.....	483-492
90. DESIGNING AND MANUFACTURE OF RADIUS PAJI HAIRERS (PAHAT RADIUS POST) ON LATHE MACHINE FOR LABORATORY AND MODULES TEACH Saiful Anwar, Rindi Genesa Hatika, B.Herawan Hayadi.....	493-498
91. MATERIAL SELECTION ANALYSIS AND MAGNET SKEWING TO REDUCE COGGING TORQUE IN PERMANENT MAGNET GENERATOR Sepannur Bandri, M. Aldi Tio.....	499-506
92. COMPARISON OF DECISION TREE ALGORITHM METHOD (C4.5) AND NAIVE BAYES TO IDENTIFY STUDENT LEARNING RESULTS WITH COOPERATIVE LEARNING MODEL Sri Restu Ningsih.....	507-511
93. ONLINE ASSESSMENT TOOLS FOR 2013 CURRICULUM BASE ON INFORMATION TECHNOLOGY Suartin, Hambali, Oriza Chandra	512-517
94. GAME BASED LEARNING TO IMPROVMENT TEACHERS KNOWLEDGE FOR TEACHING STRATEGY IN THE CLASS Suherman.....	518-523
95. LEARNING RESPONSE OF JOURNEY LEARNING COOPERATIV LEARNING AND LEARNING MODULE IN EDUCATION MEDIA LEVEL Suparno, Bulkia Rahim, Zonny Amanda Putra, Junil Adri, Jasman	524-528
96. NEED ANALYSIS APPLICATION ON THE FEASIBILITY STUDY OF THE HYDROELECTRIC POWER SELECTION (CASE IN SOLOK, PESISIR SELATAN AND SIJUNJUNG REGENCY) Suryadimal, Edi Septe, Wenny Martiana, Fahmi Rizal, Nizwardi Jalinus.....	529-534
97. DEVELOPING SOFT SKILLS LEARNING MODELFOR MECHANICAL ENGINEERING STUDENTS OF VOCATIONAL HIGH SCHOOL Suryo Hartanto	535-538
98. IMPACT OF WORK-BASED LEARNING OF CONCRETE STONE WORK PRACTICE ON DIPLOMA-III CIVIL ENGINEERING STUDENTS Syafiatun Siregar	539-543
99. DEVELOMPENT OF WEB-BASED DECISION SUPPORT SYSTEM FOR SCHOLARSHIP RECIPIENTS SELECTION USING ANALYTICAL HIERARCHY PROCESS (AHP) METHOD Titi Sriwahyuni, Dedi Irfan, Ika Pharma Dewi and Hanny Maharani.....	544-552
100. EFFECT OF ENGINE TEMPERATURE CHANGES ON INJECTION TIME OF FUEL AND GAS EMISSION OF GASOLINE ENGINE Toto Sugiarto, Dwi Sudarno Putra, Wawan Purwanto	553-557

101. EARTHQUAKE AND TSUNAMI DISASTER MITIGATION TRAINING FOR ELEMENTARY SCHOOL STUDENTS IN THE COASTAL AREA OF PADANG PARIAMAN DISTRICT WITH KYOTO INTERNATIONAL DISASTER PREVENTATION SCHOOL METHOD Totoh Andoyono, Fitra Rifwan, Revian Bodi, Prima Zola, Annisa Prita.....	558-560
102. FUNCTIONAL MEMBERSHIP ANALYSIS OF FUZZY INFERENCE SYSTEM SUGENO IN ANEMIA CLASSIFICATION Tri Monarita Johan	561-563
103. DEVELOPMENTAL OF MEDIA LEARNING BASED ON TUTORIAL VIDEO AT CHARACTER MAKE UP SUBJECT IN SMKN 6 TyasAsih Surya Mentari, MurniAstuti, and Linda Rosalina	564-570
104. PSYCHOLOGICAL FACTORS INFLUENCING THE DECISION MAKING OF PURCHASING PRODUCTS VIA ONLINE Ulfa Annida Damanik, Sri Wening	571-577
105. IMPROVING TEACHERS' PROFESIONALISM APPROPRIATE TO NEW CURRIRULUM 2017 FOR VOCATIONAL SCHOOLS BY CAPACITY BUILDING AND WORKSHOP ABOUT PREPARING LOCAL GOVERNMENT FINANCIAL STATEMENT; AN EXPERIMENTAL STUDY ON ACCOUNTING TEACHERS' FROM VOCATIONAL SCHOOLS IN WEST SUMATERA PROVINCE Vita Fitria Sari, Mayar Afriyenti, Mia Angelina Setiawan	578-585
106. THE DEVELOPMENT OF VIT (VOCATIONAL INTEREST TEST) MODEL USING DECISION SUPPORT SYSTEM (DSS) TECHNIQUE Vitriani.....	586-590
107. ANALYSING INFORMATION SYSTEM OF ACADEMIC SERVICES IN THE UNIVERSITY Wahyu Prima, Ganefri, Krismadinata	591-595
108. RESOURCE SHARING–BLENDED PROJECT BASED LEARNING (RS-BPBL©) MODEL DEVELOPMENT IN VOCATIONAL HIGH SCHOOL Wahyudi	596-602
109. DEVELOPMENT ASSESSMENT MODEL TO HIGH ORDER THINKING SKILL ORIENTATE FOR EVALUATION STUDENT COMPETENCY Wakhinuddin S, Bahrul Amin, Waskito.....	603-605
110. USE OF GEARBOX VIAR ON FISHING SHIPS Wakhinuddin S, Donny Fernandez, Andrizal, M Nasir, Rifdarmon	606-609
111. THE APPLICATION OF SIMPLE STRAIN GAUGE DYNAMOMETER IN LEARNING STYLE CUTTING LATHE Wenny Marthiana, Suryadimal, Edi Septe, Duskiardi, Andika.....	610-613
112. DESIGN OF ANDROID BASED INTERACTIVE BOOK IN INTEGRATED ISLAMIC ELEMENTATY SCHOOL OF LAN TABUR PAGARALAM CITY Yadi, Efan, Sigit Candra Setya.....	614-617

113. SMART CLASSROOM DESIGNS IN THE SMART EDUCATIONAL ENVIRONMENT Yasdinul Huda, B Herawan Hayadi	618-626
114. BUILD AND DESIGN OF BUSINESS INTELLIGENCE UNIVERSITY SYSTEM AS DECISION SUPPORT ACADEMIC Yaslinda Lizar, Asriwan Guci	627-636
115. SOIL STABILITY USING CEMENT PCC IN LUBUK MINTURUN PADANG, INDONESIA Yocky Syaida Adha Putra, Tengku Ahmad Fauzan Syah	637-642
116. INFLUENCE THE LEARNING STRATEGY AND ENTRY BEHAVIOR TO YIELD LEARNING BUILDING CONSTRUCTION AND DRAWING 1 OF STUDENT Yuwalitas Gusmareta, Fahmi Rizal, Nurhasan Syah.....	643-646
117. IMPLEMENTATION OF DISASTER PREPARED SCHOOL (SSB) IN WEST PASAMAN DISTRICT WEST SUMATERA PROVINCE Yuwalitas Gusmareta, NurhasanSyah, Laras Andreas Oktavia, RizkyIndraUtama, MuviYandra.....	647-649
118. USING MOBILE TELECOMMUNICATIONS -2000 INTERNATIONAL FOR ANALYZING TECHNOLOGY NETWORK ERA 4G-LTE ZulhamSitorus, Ganefri, NizwardiJalinus	650-653
119. FACTORS AFFECTING STUDENTS IN CHOOSING COMPUTER ENGINEERING DEPARTMENT IN STT PAYAKUMBUH Zulkifli, Dilson, Rahmad Al Rian	654-659
120. FACTORS EFFECTING ELEMENTARY SCHOOL TEACHER READINESS ON IMPLEMENTING CURRICULUM IN WEST SUMATERA Zuryanty, Hamimah, Mulyani Zein.....	660-665

THE EFFECT OF STRATEGY OF TRAINING MODELS IN LEARNING ELECTRICAL INSTALLATION

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ABSTRACT: This study aimed to determine the effect of model training strategy on learning outcomes in electrical installation courses in engineering majors of electrical engineering faculty of state universities of Padang. The subjects of this study are students of electrical engineering education courses (S1) force 2016. Which consists of 55 people as an experimental class and 52 people as a control class. Assessment instruments using performance appraisal, and the data obtained were analyzed using two-tension test (t-test). From the results of data analysis showed that the class using the model training strategy has a higher average value when compared with students using conventional learning. Based on the calculation of t-test obtained t arithmetic > t table is $4.21255 > 2.0042$. Thus, the hypothesis in this study is that there is a significant influence of electrical installation learning results in electrical engineering majors engineering faculty of state universities Padang

Keywords: Influence Strategy, Training Model, Learning Outcomes

1. INTRODUCTION

The success rate of Indonesia's national development in all fields will depend on human resources as the nation's asset in optimizing and maximizing the development of all human resources. These efforts can be done and pursued through education, both through formal education and non-formal education channels. One institution on a formal education path that prepares its graduates to have excellence in the world of work and the Industrial world.

Education is a process of establishing qualified human resources. Improving the quality of education can only be achieved through improving the quality of the learning process which leads to improving the quality of educational outcomes. The realization of the government's efforts to prepare educational graduates in entering a challenging era of globalization is to apply an industry-minded curriculum.

Student competency will be formed and developed through a learning process that uses student-centered, learning-oriented approaches and methods. This learning will provide a challenging and fun learning experience. Students are expected to use the in-depth approach and strategic approach to learning, not just learning to remember information or learn to graduate. Lessons that need to be developed by lecturers in the framework of the formation of competencies are interactions that enable students to build knowledge, attitudes, and skills through various transformations of the learning experience.

Associated with learning to improve student competence, curriculum development needs to be oriented to the world of work. Law No.

20/2003 on National Education System emphasizes the autonomy of educational units, competency-based curriculum and paradigm shift from teaching to learning. The existence of paradigm shift from teaching to learning requires a more innovative learning pattern, giving priority to increasing the potential of study subjects, learning facilities, and facilities and infrastructure. The establishment of student competence is an educational process that requires the involvement of various parties, among others, family, school/campus, work/industry, government and professional associations.

State University of Padang (UNP) as one of the institutions of higher education institution in Indonesia always strives to realize the national education function stated in Act on National Education System Number 20 the Year 2003, that is to develop the ability and form the character and civilization of dignified nation in order to educate the life and organize the process education to produce educators who will participate to build the country through education.

Department of Electrical Engineering Faculty of the Engineering State University of Padang seeks to increase the quality of graduates of education today that leads to the mastery of both academic and professional competence. So the lecturing process plays an important role to equip graduates to be able to adapt to employment ". Therefore it is recommended to the lecturer as a learning facilitator able to package the lectures that motivate students to work in the business world/industry. Improvement of student learning outcomes in learning can be done with a variety of ways, one of them with the application of effective learning strategies.

One of the learning strategies is learning model training strategy. Learning strategy Model Training is a strategy that focuses on job skills that are skills that involve all the senses, and are trained repeatedly in the form of organized and coordinated actions.

Learning Model Strategy Training will improve students' activity. Because in this strategy there is a demonstration or performance by lecturers before the students do lectures so that the students understand the procedure of doing the practice properly and correctly, the practice of diversion with the assignment of practical tasks that are more complex than the practical tasks taught so that students can develop an understanding of the material is linked to problems in the field or industry by giving the task of a visit to the industry so that students can match the lessons learned in school with the state of the field or the industry.

The lesson uses the Training Model's strategy of 6 stages: (1) Submission of objectives, (2) Explanation of supporting materials, (3) Demonstration of performance, (4) Practice simulation, (5) Transfer Practices and (6) Industrial Visits. Problems occur above, the author tries to improve learning outcomes is by comparing the students learning outcomes between learning strategies Model with conventional, this is in accordance with the title of research that the authors do is Influence Strategy Model Training on the recovery of electrical installations in engineering majors Electrical Engineering Faculty State University Padang.

2. RESEARCH METHODS

The method of investigation is the experimental method. This research consists of two classes namely control class and experiment class. In the experimental class in doing the learning in accordance with the procedure of model training strategy and on the control, the class is done by conventional learning.

This type of research is an experimental research that is categorized into quasi-experimental type. The research was conducted at the Department of Electrical Engineering Faculty of the Engineering State University of Padang in Electrical Engineering Education Study Program S1 As the subject of research is the 3rd semester students of Electrical Engineering Education Study Program (S1) FT UNP which took the electrical installations totaling 107 people, consisting of two classes ie 2LA and 2LB. Where 2LA is an experimental class using Model Training strategy and 2LB is a control class that uses conventional learning. The determination of this class is done randomly from the existing class, this is done because the average score of student's GPA does not differ significantly. Thus, based on the t-test the two classes have the same initial capability.

The research design used in this study is presented as follows:

Table 1. Research Design

Class	Treatment	Result
Experiment	X₁	O₁
Control	X₂	O₂

Information:

X1= Treatment with Training Models

X2 = Conventional learning

O1 = The results of the experimental

O2 = Results of a control class performance assessment

The type of instrument used in this study is the assessment of performance. According to Depdiknas (2009: 14) "Performance assessment is an assessment done by observing the activities of learners in doing something". Validity in this research is content validity. Implementation Content validity is by arranging aspects to be assessed in the electrical installation courses according to the curriculum in the Department of Electrical Engineering FT UNP.

After data collected conducted analysis data. Prior to testing the research hypothesis, student learning outcomes must meet the requirements of normality test and homogeneity test:

1. Normality test

Normality test is used to determine the distribution of student learning outcomes, whether the data is normally distributed or not. Normality test is done by using chi-square test proposed by Riduwan (2006: 124). Criteria test normality if \leq then the data is normally distributed.

2. Homogeneity test

Homogeneity test was conducted to find out whether the research data has the same variance. The homogeneity test of experimental class and control class is done using F test with the formula of Sudjana (2005: 249). Homogeneity testing criterion is if $F_{hitung} < F_{tabel}$ means data have homogeneous variance, otherwise if $F_{count} > F_{tabel}$ means data not homogeneous.

3. Hypothesis test

To determine whether there is a difference to the learning outcomes between the two classes of subjects, for normal and homogeneous distributed data, an average two-t-test (s) using the formula Sudjana (2005: 241) is used. The t value of the calculated result is compared with the t value of the table. The provisions for acceptance of the research hypothesis are:

a. Ho accepted if t count $< t_{tabel}$ and H_a rejected.

b. H_0 is rejected if $t_{hitung} > t_{tabel}$ and H_a accepted.

3. RESULTS AND DISCUSSION

Data Description

This research was conducted in semester July - December 2017 Academic Calendar State University of Padang. The implementation of the research consists of 6 lecture meetings that include; Design of Electric Installation of simple House, Electricity Installation of Multi-storey Home, Maintenance, and Maintenance of Electrical Installation. Based on the result of the research, it is found that the average value () of the students' experimental learning result is higher than the control class as can be seen in table 2

Table 2. Average and Percentage Completion of Experiment and Control Class

Class	Amount	Result
Experiment (2LA)	55	85,5
Control (2LB)	52	81,3

Strategy Training model is essentially a strategy that can facilitate students in the lecture so that students become skilled. By using the strategy Training model requires students to work in stages and structured, which includes: the preparation stage, demonstration, imitation, and practice.

Based on the description and analysis of data that has been done on student learning outcomes on electrical installation learning through learning model training in the experimental class and conventional learning on the electronics engineering education faculty of Universitas Negeri Padang, there are differences in learning outcomes between the experimental class and the control class. This difference can be seen from the highest value of the experimental class 96 with an average of 85.5, while the control grade is at a high of 89 with an average of 81.41. Thus, it can be stated that the students' learning outcomes in the experimental class are higher than the students' learning outcomes of the control class.

Strategy Training model is essentially a strategy that can facilitate students in the lecture so that students become skilled. By using the strategy Training model requires students to work in stages and structured, which includes: the preparation stage, demonstration, imitation, and practice. The following is the normal curve of the experimental class and control class as follows:

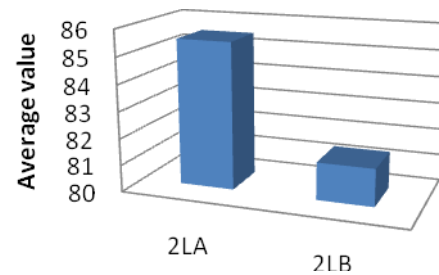


Figure 1. Graph of Experiment and Control Class

From the graph, the difference in the mean values of the two classes taught. Where the experimental class (2LA) obtained an average value of 85.5, while for control class (2LB) taught by conventional methods obtained an average value of 81.4.

Data Analysis

The data analysis here is done manually. Differences in learning outcomes were analyzed using t-test by first looking at whether the subject was normally distributed and had a homogeneous variant. Therefore tested normality and homogeneity test.

a. Normality test

Based on the calculation results in the experimental class at can $\chi^2_{hit} = 6.37$ and control class at can $\chi^2_{hit} = 0.908$. While for

χ^2_{ta} both classes at significance level with $\alpha = 0,05$, got $\chi^2_{ta} = 9,488$. It can be concluded that the data obtained from the two classes are normally distributed.

b. Homogeneity Test

Test homogeneity to see whether the two classes are homogeneous or not. Based on calculation results obtained F_{hitung} is 1.389 and F_{table} value in experiment class and control class with $dk_{numerator} = 23$ and $dk_{denominator} = 22$ is 2.04 at a significance level of 0.05. Thus $F_{count} < F_{table}$ means that both classes have a homogeneous variance.

c. Hypothesis test

Based on the normality test and homogeneity test of the final test variant it was found that the two classes were normally distributed and had homogeneous variance, so t-test was used to see the difference between the two classes. From the calculation results obtained count = 3.62, and the value of $t_{table} = 2.0157$. Thus $t_{count} > t_{table}$, then H_0

is rejected and also receive Ha. It can be concluded that there are significant differences in student learning outcomes that apply the strategy of Model Training with the conventional learning model in the electrical engineering practice course on the students of Electrical Engineering Education (S1) Program of Electrical Engineering Faculty of Engineering Universitas Negeri Padang.

Discussion

Based on the results of data analysis there are significant differences in student learning outcomes that apply the strategy of Model Training with the conventional learning model in Electrical Installation courses in the lectures of undergraduate students (S1) majoring in Electrical Engineering Faculty of Engineering, State University of Padang. Where the application of Strategy Strategy Model Training scores higher than students who are taught conventionally.

This is because the Model Training strategy is able to generate student motivation in learning so that students are more motivated to improve their learning achievement. Model Strategy Training is a strategy that teaches how to bring students to learn and teach. The atmosphere of training means, not to bring students to the industrial world with sophisticated equipment.

But how the industry trains newly skilled employees are imitated by the strategy of the Model Training Program consists of five main models: 1) work instructions, 2) work methods, 3) employment relations, 4) work safety, 5) program development. All these programs are used to support the success of learning in the course. Application of learning strategy of Model Training in Electric Installation lecture able to increase student motivation in lecture. This is seen with the seriousness of students in doing all job sheet at every lecture meeting.

4. CONCLUSION

Conclusion

Based on data analysis and discussion, it can be concluded that the learning motivation students using Model Training strategy are better than conventional learning. This can be seen from the learning result obtained by the students who apply the strategy of the Training model is higher than the class that takes the conventional model. Thus there are differences in learning outcomes are significant between the application of training models on electrical installation lectures with conventional learning on students Electrical Engineering Education Studies (S1) Faculty of

Engineering Universitas Negeri Padang

Suggestions

It is expected that FT-UNP Leaders, especially lecturers to always try to improve student's learning achievement and foster self-reliance learning so as to complete the study on time with good achievement quality.

For the next researcher, it is suggested that the factors that influence the learning achievement are included as part of the research so that the research result is more objective.

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