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 4th International Conference on Technical and Vocation Education and Training. This conference has taken place in Hospitality Center Universitas Negeri Padang, November 9-11, 2017.

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. Technical vocational educational 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 176 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.

Eight keynote speakers have taken a part in the conference, namely Prof. Intan Ahmad, Ph.D. (Director general of learning and student affairs, Kemenristek Dikti) and Prof. Josaphat Tetuko Sri Sumantyo, Ph.D. (CEReS Chiba University) and Prof. Dr. Maizam Alias (UTHM Malaysia) and Prof. Ganefri, Ph.D. (Rector of UNP) and Prof. Dr. Ramlee bin Mustapha (UPSI Malaysia) and Prof. Nizwardi Jalinus, Ed.D. (Chair of TVET doctoral program, FT UNP) and Prof. Michael Koh, Ph.D. Dr. Fahmi Rizal, M.Pd., MT (Dean of FT UNP). 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 4th International conference on TVET 2017 and most importantly, our gratitude to all scholars who support and tolerated our mistake during the conference.

Padang, 9 November 2017

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

DAFTAR ISI PROSIDING 4th ICTVET UNP 2017

15	Hendri Nurdin, Hasanuddin, Waskito, Refdinal, Darmawi	ASSESSMENT OF PRODUCT PROTOTYPE EXISTENCE AS A MEDIA OF LEARNING TO ACCELERATE THE TRANSFER OF TECHNOLOGY AND DIVERSIFICATION IN RURAL INDUSTRIES
16	Nur Hidayati, Muhammad Ridha Ridwan	INTERACTIVE MULTIMEDIA PROGRAM WITH PROBLEM-BASED LEARNING METHOD TO IMPROVE LEARNING OUTCOMES INBIOLOGY SUBJECT
17	Sukardi, M.Giatman, Remon Lapisa, Purwantono, Refdinal	A MICRO HYDROPOWER GENERATOR AS AN ALTERNATIVE SOLUTION FOR ENERGY PROBLEM SOLVING IN INDONESIAN REMOTE AREA
18	Tri Monarita Johan	FUNCTIONAL MEMBERSHIP ANALYSIS OF FUZZY INFERENCE SYSTEM SUGENO IN ANEMIA CLASSIFICATION
19	Henny Yustisia	CURRICULUM ANALYSIS OF PREREQUISITE COURSE AT INDUSTRIAL FIELD PRACTICE (IFP) (Case Study: Competency Compliance)
20	Suryadimal, Edi Septe,Wenny Martiana, Fahmi Rizal, Nizwardi Jalinus	NEED ANALYSIS APPLICATION ON THE FEASIBILITY STUDY OF THE HYDROELECTRIC POWER SELECTION (CASE IN SOLOK, PESISIR SELATAN AND SIJUNJUNG REGENCY)
21	Nuzul Hidayat, Ahmad Arif, M. Yasep Setiawan	RELATIONDRAG FORCE REDUCTION ON CIRCULAR CYLINDER USING CIRCULAR DISTURBANCE BODY WITH TURBULENCE INTENSITY
22	Dwiprima Elvanny Myori, Citra Dewi, Erita Astrid, Ilham Juliwardi	IMPLEMENTATION OF CONTEXTUAL TEACHING AND LEARNING ON ANALYZING ELECTRICAL CIRCUITS SUBJECT
23	Dwi Sudarno Putra, Misra Dandi Utama, Dedi Setiawan, Remon Lapisa, Ambiyar	EVALUATION OF LEARNING PROCESS USING CIPP MODEL
24	Remon Lapisa, Dwi Sudarno Putra, Ahmad Arif, Syafmi Algifari Abda'u	EFFECT OF GASOLINE ADDITIVE MATERIALS ON ENGINE PERFORMANCE
25	Muhammad Luthfi Hamzah, Hamzah, Astri Ayu Purwati	THE ROLE OF INFORMATION TECHNOLOGY IN THE IMPROVEMENT OF TEACHER'S COMPETENCIES AND TEACHING LEARNING PROCESS EFFECTIVENESS IN ESA SEJAHTERA SCHOOL PEKANBARU
26	Jasman, Nelvi Erizon, Syahrul, Junil Adri, Bulkia Rahim	SIMPLE WATER PURIFIER USING MULTILEVEL SYSTEM

27	Vita Fitria Sari, Mayar Afriyenti, Mia Angelina Setiawan	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
28	Ulfa Annida Damanik, Sri Wening	PSYCHOLOGICAL FACTORS INFLUENCING THE DECISION MAKING OF PURCHASING PRODUCTS VIA ONLINE
29	Purwantono, Refdinal, Hendri, Syahrul	DEVELOPMENT OF MODEL OF PROPELLER-CROSS FLOW WATER TURBINE FOR PICO HYDRO POWER GENERATORTITLE
30	Remon Lapisa, Hendika Syahputra, Irma Yulia Basri, Rifdarmon, Hendra Dani Saputra	AN EXPERIMENTAL STUDY ON THE EFFECT OF CENTRIFUGAL CLUCTH COOLING GROOVE ON MOTORCYLCE PERFOMANCE
31	Almasri	EFFECT OF MIND MAPPING LEARNING METHODS ON LEARNING OUTCOMES
32	Emy Leonita, Nopriadi, Ahmad Satria Efendi, and Niswardi Jalinus	NEEDS ANALYSIS ON INCREASING COMPETENCY TEST RESULTSSTUDENTS IN S1 PROGRAM OF PUBLIC HEALTH SCIENCESSTIKES HANG TUAH PEKANBARU
33	Fenny Purwani, Nizwardi Jalinus, Ambiyar	THE DESIGN OF LECTURER PERFORMANCE EVALUATION MODEL BASED ON ANALYTIC NETWORK PROCESS (ANP)
34	Wagino, Toto Sugiarto, Dori Yuvenda, Ahmad Arif	EFFECT OF EGRICS INJECTION DURATION ON EMISSION DIESEL ENGINE
35	Rahmatul Husna Arsyah, Ulya Ilhami Arsyah, Nizwardi Jalinus, Azwar Inra	DEVELOPMENT OF PRODUCT PROMOTION APPLICATIONS MICRO SMALL AND MEDIUM ENTERPRISES (SMEs) BUKITTINGGI CITY
36	Muh. Barid Nizarudin Wajdi, Achmad Fathoni Rodli	*RAHMATAN LIL ALAMIN* , THE CONCEPT OF MULTICULTURAL EDUCATION
37	Raimon Kopa, Afdhal Husnuzan, Bambang Heriyadi	BLASTING DESIGN DEVELOPMENT AREA DECLINE CIBITUNG AND CIKONENG UNDERGROUND MINE PT CIBALIUNG SUMBERDAYA BANTEN
38	Irwanto Zarma Putra, Citra Dewi	CELL ROTATION TO RESOLVE THE WEAKEST CELL DAMAGE IN THE BATTERY PACK IN DISCHARGING PROCESS
39	Wahyu Prima, Ganefri, Krismadinata	ANALYSING INFORMATION SYSTEM OF ACADEMIC SERVICES IN THE UNIVERSITY
40	Lika Jafnihirda, Yuliawati Yunus, Nizwardi Jalinus, Azwar Inra	MEDIA DEVELOPMENT OF PRODUCT PROMOTION AND STUDENTS STUDENT SMK NEGERI 8 PADANG CITY WEB-BASED

41	Roni Sanjaya, Muhammad Hasmil Adiya, Gusrianty	DEVELOPMENT PROBLEM BASED LEARNING MODEL USING VIRTUAL ENVIRONMENT FOR ENTREPRENEURSHIP COURSES
42	Rasinov Chandra, Donny Fernandez, Erzeddin Alwi	IMPLEMENTATION OF BASIC TECHNOLOGY EDUCATION MODEL OF TEACHING IN WEST SUMATERA YUNIOR SECONDARY SCHOOL
43	Zuryanty, Hamimah, Mulyani Zein	FACTORS EFFECTING ELEMENTARY SCHOOL TEACHER READINESS ON IMPLEMENTING CURRICULUM IN WEST SUMATERA
44	Doni Tri Putra Yanto, Sukardi, Deno Puyada	EFFECTIVENESS OF INTERACTIVE INSTRUCTIONAL MEDIA ON ELECTRICAL CIRCUITS COURSE: THE EFFECTS ON STUDENTS COGNITIVE ABILITIES
45	Rasinov Chandra, Anggi Aprianto, Mawardi, Reza Rahmadani	FACTORS AFFECTING THE AUTOMOTIVE ENGINEERING STUDENTS' INTEREST ON TEACHING PROFESSION
46	Rasinov Chandra, M.Nasir, Reza Rahmadani, Mawardi	PAIR (PULSED SECONDARY AIR INJECTION) EFFECTS TO EXHAUST GAS EMISSION
47	Mir'atul Khusna Mufida, Hendra Saputra, Ardian Budi Kusuma Atmaja, Wenang Anurogo	IDENTIFICATION SYSTEM (AIS) DATA BY INTERACTIVE VISUALIZATION APPROACH
48	Muh. Barid Nizarudin Wajdi, Andi Mursidi	LESSON STUDY FOR IMPROVING A LEARNING QUALITY
49	Heri Prabowo, Sumarya	INVESTIGATION OF CHEMICAL FEASIBILITY AND DISTRIBUTION OF IRON SAND RESERVE REGIONAL AREA OF AGAM DISTRICT FOR CEMENT RAW MATERIAL IN PT. SEMEN PADANG
50	Hasan Maksum, Aslimeri, Putra Jaya, Wanda Afnison	DESIGN OF ELECTROMAGNETIC REGENERATIVE SHOCK ABSORBER AS A TOOL OF HARVESTING VIBRATION ENERGY ON VEHICLE
51	Vitriani	THE DEVELOPMENT OF VIT (VOCATIONAL INTEREST TEST) MODEL USING DECISION SUPPORT SYSTEM (DSS) TECHNIQUE
52	Fitri Yanti, Rijal Abdullah, Krismadinata	DEVELOPMENT OF ONLINE EXAMINATION SYSTEM USING WONDERSHARE QUIZCREATOR BASED ON WEB
53	Hansi Effendi, Yeka Hendriyani	THE DEVELEMENT OF INTERACTIVE BLENDED PROBLEM BASED LEARNING MODEL FOR PROGRAMMING SUBJECT
54	Z Mawardi Effendi, Hansi Effendi and Hastria Effendi	ACCESSIBILITY AND ACCEPTABILITY OF THE BMI MODEL AT INSTITUTE OF TEACHER TRAINING AND PEDAGOGY

55	Sukardi, Deno Puyada, Rizky Ema Wulansari, Mahesi Agni Zaus	NEEDS ASSESSMENT ON DEVELOPMENT OF INSTRUCTIONAL MEDIA BASED ANDROID AT VOCATIONAL HIGH SCHOOL
56	Ambiyar Febri Prasetya Yufrizal	DESIGN OF SKILLASSESMENTIN COMPUTER NUMERICAL CONTROL PROGRAMMING SUBJECT
57	Edi Septe, Suryadimal, Wenny Marthiana, Nizwardi Jalinus, Ramli	CONDUCTING LABOR MARKET ASSESSMENT IN ENGINEERING CURRICULUM DEVELOPMENT
58	Safril, Dedi Wardianto	ANALYZING OF TECHNICAL CUTTING OF EMPTY PALM BUNCHES
59	Waskito, Zonny Amanda Putra, Surfa Yondri, Rahmat Aziz Nabawi, Viky Prasetio Wahyudi	PACK CARBURIZATION OF MILD STEEL, USING SHELL AS CARBURIZER TO TEST HARDNESS
60	Ramli, Febri Prasetya, Silvia Martiveri	ANALYSIS OF LEARNING COMPETENCY ENGINEERING STUDENTS VOCATION D 3 FT UNP
61	Elida, Agusti Efi	USE OF PRODUCTS-BASED MODULE IN THE PROCESS OF LEARNING TO THE PRACTICAL COURSE
62	Nanang Alamsyah, Larisang, Muhammad Ansyar Bora	DESIGNING STRATEGY MAPS FOR PRIVATE ENGINEERING COLLEGE
63	Abdullah Merjani, Yunesman	LEARNING MODEL REQUIREMENTS IN VOCATIONAL TRAINING OF WELDING INSPECTOR BASED ON QUALITY FUNCTION DEPLOYMENT
64	Alvia Wesnita	MODEL TO INCREASE STUDENTS ENTREPRENEURS' INTEREST AT COLLEGE EDUCATION
65	Irma Yulia Basri, Delsina Faiza, Remon Lapisa, Nasrun	APPLICATION OF LEARNING BASED PRODUCTS IN ORDER TO GROW INTEREST IN ENTREPRENEURSHIP OF VOCATIONAL STUDENTS
66	Prima Zola, Rahmat, Fitra Rifwan	BRACING CROSS SECTION EFFECT TO DISSIPATION ENERGY BY NUMERICAL ANALYSIS
67	Totoh Andoyono, Fitra Rifwan, Revian Bodi, Prima Zola, Annisa Prita	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
68	Ika Parma Dewi, Lativa Mursida, Yani Rizkayeni Marta	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

69	Rizky Indra Utama, Nurhasan Syah, Rijal Abdullah	DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD OF INSTRUCTIONAL MEDIA ON BUILDING CONSTRUCTION
70	Yuwalitas Gusmareta, Nurhasan Syah, Laras Andreas Oktavia, Rizky Indra Utama, Muvi Yandra	IMPLEMENTATION OF DISASTER PREPARED SCHOOL (SSB) IN WEST PASAMAN DISTRICT WEST SUMATERA PROVINCE
71	Zulham Sitorus, Ganefri, Nizwardi Jalinus	USING MOBILE TELECOMMUNICATIONS -2000 INTERNATIONAL FOR ANALYZING TECHNOLOGY NETWORK ERA 4G-LTE
72	Faiza Rini, Mahesi Agni Zaus	THE VALIDITY OF MOBILE LEARNING MANAGEMENT SYSTEM (M-LMS) AT UNIVERSITY
73	Zulfi Azhar, Rolly Yesputra, Eva Yuni Handayani	DECISION SUPPORT SYSTEM IN SELECTING THE SCHOLARSHIP RECIPIENTS WITH SAW METHOD
74	Muhammad Fakhriza, Kasman Rukun, Nazaruddin Nasution	DECISION SUPPORT SYSTEM PROVIDING FUNDS FOR UNDERPRIVILEGED STUDENTS
75	Muhammad Sabir Ramadhan, Neni Mulyani, Muhammad Amin	IMPLEMENTATION OF PROJECT BASED LEARNING MODEL IN COURSE WEB DESIGN
76	Syafiatun Siregar	IMPACT OF WORK-BASED LEARNING OF CONCRETE STONE WORK PRACTICE ON DIPLOMA-III CIVIL ENGINEERING STUDENTS
77	Nurmaidah	ANALYSIS OF VOLUME AND STRONG CONCRETE IMPROVEMENT ON NON-SAND CONCRETE MIXED WITH ADDITION BAKING POWDER
78	M. Giatman, Murad, Refki Adinata, Thamrin	FLAT JACK EQUIPMENT DEVELOPMENT MEASUREMENT OF STONE ON STEAM AND WALLS SETTLED UNDER MINE
79	M. Giatman, Waskito, Maruli Sihombing	DEVELOPMENT OF MECHANICAL TECHNOLOGY LEARNING MODULE PROGRAM EXPERTISE OF SMK ENGINEERING
80	Raimon Efendi	VIRTUAL LAB IMPLEMENTATION QOS METAROUTER ON COMPUTER NETWORK LEARNING
81	Iskandar G.Rani, Widya Salmita	IMPROVEMENT OF CONCRETE QUALITY WITH ADDITION OF SUNUA PASIR PADANG PARIAMAN WEST SUMATRA
82	Nurhasan Syah, Sanny Edinov	THE CONTRIBUTIONS OF DISCIPLINE AND ENVIRONMENTAL KNOWLEDGE ON CLEAN BEHAVIOR OF STUDENTS IN PUBLIC ELEMENTARY SCHOOL KAMPUNG BARU PARIAMAN, WEST SUMATERA
83	Zulkifli, Dilson, Rahmad Al Rian	FACTORS AFFECTING STUDENTS IN CHOOSING COMPUTER ENGINEERING DEPARTMENT IN STT PAYAKUMBUH

84	Arina Luthfini Lubis, Ririt Dwiputri Permatasari and M. Ropianto	ANALYSIS OF THE DECREASE IN THE NUMBER OF STUDENTS MAJORING COMMERCE DEPARTMENT (STUDY CASE: SMK IBNU SINA BATAM)
85	Eko supriadi, Syahril Syahril, Anni Faridah, Syaiful Islami	DEVELOPMENT OF INSTRUCTIONAL MODULE OF CNC PROGRAMMING THEORY
86	Fadhilah, Z. Mawardi Effendi, Ridwan	CONTEXTUAL TEACHING AND LEARNING (CTL) MODEL DEVELOPMENT IN APPLIED PHYSICS
87	Elfi Tasrif, Husaini Usman, Kasman Rukun	THE PROFESSIONALISM OF VOCATIONAL HIGH SCHOOL SUPERVISORS IN THE IMPLEMENTATION OF ACADEMIC SUPERVISION ON THE OFFICE OF EDUCATION PADANG
88	Lita Sari Muchlis, Kasman Rukun, Krismadinata, Yahfizham	A NEW MODEL MOBILE LEARNING MANAGEMENT SYSTEM BASED ON MOODLE IN UNIVERSITY
89	Syahril, Rahmat Azis Nabawi, Purwantono, Refdinal, Irzal, Nofri Helmi	DESIGN OF WASTE SEPARATOR MACHINE: USING WATER PRESSURE AND DIFFERENCE WEIGHT TYPE WASTE WATER
90	Fivia Eliza, Hamdani, Rahmat Hidayat, Erita Astrid, Panji	GROUP INVESTIGATION (GI) LEARNING MODEL ON THE SUBJECT OF UNDERSTANDING THE BASIC ELECTRONICS
91	Dicky Nofriansyah, Ganefri, Ridwan	A INTELLIGENCE-COMPUTER ASSISTED INSTRUCTION MODEL BASEDON PROJECTS AND BLENDED LEARNING (PJ2BL) ON CRYPTOGRAPHY TECHNIQUES
92	Haryadi, Yussa Ananda, Dicky Nofriansyah	A VISUAL APPROACH - SINGLE LINKAGETECHNIQUES FOR CLUSTERING OF PALM SEEDS DATA
93	M.Syaifuddin, Ahmad Fitri Boy, Ali Ikhwan	SECURITY OF MEDICAL RECORD WITH RIVEST SHAMIR ADLEMAN (RSA) METHOD
94	Hefri Hamid, Nizwardi Jalinus, Syahril, Ambiyar, Febri Prasetya	A MODEL PREVENTIVE MAINTENANCE CONTROL IN THE MACHINE TURNING AT WORKSHOP THE FACULTY OF ENGINEERING OF THE STATE UNIVERSITY IN PADANG
95	Yadi, Efan, Sigit Candra Setya	DESIGN OF ANDROID BASED INTERACTIVE BOOK IN INTEGRATED ISLAMIC ELEMENTATY SCHOOL OF LAN TABUR PAGARALAM CITY
96	Khairul, Rahmad Budi Utomo	DECISION SUPPORT SYSTEM FOR RECOMENDATION CERTIFICATION TEACHER ON VOCATIONAL HIGH SCHOOL
97	Suherman	GAME BASED LEARNING TO IMPROVMENT TEACHERS KNOWLEDGE FOR TEACHING STRATEGY IN THE CLASS

98	Erwinsyah Simanungkalit	EFFECT OF PROJECT BASED LEARNING MODEL IN IMPROVING STUDENT LEARNING RESULT
99	Ismael, Rian Farta Wijaya	PRODUCT DESIGN INTERACTIVE MULTIMEDIA BASED LEARNING FOR THE INTRODUCTION OF COLORS, LETTERS, NUMBERS, SHAPES, PUZZLE AND QUIS GAMES
100	Solly Aryza, Hermansyah, Muhammad Irwanto, Zulkarnain Lubis, Ali Ikhwan	A NOVELTY OF QUALITY FERTILIZER DRYER BASED ON SOLAR CELL AND ANN
101	Yaumal Arbi, Eka R. Aidha	SIMULATION OF MERCURY TRANSPORT FROM GOLD MINING ACTIVITIES IN PELAWAN RIVER, SAROLANGUN
102	Dedi Yulhendra, Yoszi Mingsi Anaperta	THE MODELING OF MASSIVE LIMESTONE USING INDICATOR KRIGING METHOD (CASE STUDIES OF MASSIVE LIMESTONE IN PT SINAR ASIA FORTUNA)
103	Aswardi, Oriza Chandra, Hendri, Ali Akmal Zoni	DEVELOPMENT OF MEDIA TRAINER MOTOR CONTROL FAULT SIMULATION FOR ELECTROMAGNETIC CONTROL SYSTEM COURSE AT SMK NEGERI 1 PADANG
104	Murad, Raimon Kopa, Dedy Yulhendra	APPLICATION OF WORK-BASED LEARNING SPSGBLASTING TECHNIQUE, MINING AT ENGINEERING PROGRAM
105	Edidas, Dedy Irfan	DIFFERENCES IN LEARNING OUTCOMES IN THE PRACTICE OF MICROCONTROLLER SYSTEM USING MCS51 MICROCONTROLLER TRAINER KIT
106	Hanne Aulia, Riki Mukhaiyar	A NEW DESIGN OF HANDLESS STIRRED DEVICE
107	Ernawati	THE READINESS OF STUDENT TO ENTREPRENEUR THROUGH INCORPORATION OF THE PILOT PROJECT PRACTICE
108	Indra Wijaya, Isra Mouludi, Fandy Neta, Yaslinda Lizar, Satria Ami Marta	INFORMATION SYSTEM AND REPORT VALUE PROCESSING BASED MICROSOFT VISUAL BASIC 6.0 ON SENIOR HIGH SCHOOL (CASE STUDY AT SMAN 12 PADANG)
109	Irwan Yusti, Ganefri, Ridwan	DESIGN OF SIMULATOR FOR REPLACEMENT OFTOOLSPRACTICE DIGITAL ENGINEERING IN THE VOCATIONAL SCHOOL
110	Faiza Rini, Nizwardi Jalinus, Fahmi Rizal	IMPLEMENTATION OF MOBILE LEARNING MANAGEMENT SYSTEM (M-LMS) TO IMPROVE THE EFFECTIVENESS OF STUDENT'S LEARNING ENGAGEMENT
111	Eddis Syahputra Pane, Kori Cahyono	DOMESTIC EMPLOYMENT PROCESSING SYSTEM ON WORKING PROTECTION AND TRANSMIGRATION USING GEOGRAPHIC INFORMATION SYSTEM (GIS)
112	Netty Juliana	DEVELOPMENT OF MALAY FRUIT ORNAMENT
113	Oktaviani, An Arizal, Nadra Mutiara Sari	ANALYSIS OF APPROPRIATE PEDESTRIAN CROSSING FASILITIES

114	Rahmaniar, Agus Junaidi	THE POTENTIAL OF RENEWABLE ENERGY (STUDY CASE IN TOMUAN HOLBUNG VILLAGE, ASAHAN REGENCY OF SUMATERA UTARA PROVINCE)
115	Ija Darmana, Nizwardi Jalinus, Ganefri	IDENTIFICATION OF TECHNICAL PROGRAM TEST PROGRAMS ELECTRICITY CONSTRUCTION SERVICES BUSINESS
116	Rusli Saputra, Sophan Sophian, Delia Putri	MULTIMEDIA INTERACTIVE IN WEB PROGRAMMING SUBJECTS
117	Youmil Abrian, Kasmita, Putri Rahma Mulia	COMPANY PROFITABILITY ANALYSIS BEFORE AND AFTER CORPORATE REBRANDING (Case study in Kyriad Bumiminang Hotel July – December 2015 and July – December 2016 period)
118	Yuwalitas Gusmareta, Fahmi Rizal, Nurhasan Syah	INFLUENCE THE LEARNING STRATEGY AND ENTRY BEHAVIOR TO YIELD LEARNING BUILDING CONSTRUCTION AND DRAWING 1 OF STUDENT
119	Leni Marlina, Aswandi	LEARNING BROADCAST VIDEO SYSTEM WITH H264 VIDEO ENCODING RASPBERRY PI
121	Rice Novita	MEASUREMENT SYSTEM MAJORS OF TALENT INTEREST AND CAREER STUDENT USING CERTAINTY FACTOR
122	Resmi Darni, Z. Mawardi Effendi and Selamat Triono	EXPERT MODEL SYSTEM ON ENTREPRENEURSHIP PERSONALITY
123	Adree Octova, Ansosry, Yoszi Mingsi Anaperta, Indah Elok Mukhlisah	THE PROSPECT OF OFFSHORE IRON SAND IN TIRAM BEACH PADANG PARIAMAN REGENCY WEST SUMATERA
124	Arwizet K, Nizwardi Jalinus, Krismadinata	COLLABORATIVE PROJECT-BASED LEARNING: AN INSTRUCTIONAL DESIGN MODEL IN THERMODYNAMICS ON TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET)
125	Elda Martha Suri	IMPROVING THE ESP STUDENTS' VOCABULARY BY USING PICTURES IN CIVIL ENGINEERING STUDY PROGRAM AT FIRST SEMESTER OF EKASAKTI UNIVERSITY PADANG
126	Gunawan Ali, Kasman Rukun, Syahril	TRAINING MODEL-BASED KNOWLEDGE MANAGEMENT SYSTEM FOR VOCATIONAL HIGH SCHOOL TEACHERS SKILLS ENGINEERING COMPUTER NETWORK
127	Dina Ampera, Asrah Rezki Fauzani	INTERACTIVE VIDEO MEDIA WITH THE APPLICATION OF GROUP LEARNING STRATEGY IN THE FACIAL SKIN CARE COURSE
128	Kemala Jeumpa	TOOLS DEVELOPMENT ON ENERGY-EFFICIENT BUILDING INNOVATIONS USING ROOT CAUSE ANALYSIS
129	Kinanti Wijaya, Daniel Irvansius Tampubolon	IMPACT OF THE TWI LEARNING MODEL IN LEARNING STONE AND CONCRETE CONSTRUCTIONS ON VOCATIONAL EDUCATION

130	Reno Yelfi, Mukhayar, Nizwardi Jalinus, Azwar Ananda	NEED ANALYSIS ON INDUSTRY REGARDING QUALIFICATION OF GRADUATES DIPLOMA III CULINARY
131	Sepannur Bandri, M. Aldi Tio	MATERIAL SELECTION ANALYSIS AND MAGNET SKEWING TO REDUCE COGGING TORQUE IN PERMANENT MAGNET GENERATOR
132	Sri Restu Ningsih	COMPARISON OF DECISION TREE ALGORITHM METHOD (C4.5) AND NAIVE BAYES TO IDENTIFY STUDENT LEARNING RESULTS WITH COOPERATIVE LEARNING MODEL
133	Suartin, Hambali, Oriza Chandra	ONLINE ASSESSMENT TOOLS FOR 2013 CURRICULUM BASE ON INFORMATION TECHNOLOGY
134	Suryo Hartanto	DEVELOPING SOFT SKILLS LEARNING MODEL FOR MECHANICAL ENGINEERING STUDENTS OF VOCATIONAL HIGH SCHOOL
135	Ali Ikhwan, YasminMohd Yacob, Solly Aryza	CLUSTER ANALYSIS DISTANCE INTER DISTRICT USING SINGLE LINKAGE METHOD FOR DETERMINATION OF MPLIK CAR OPERATION ZONE IN MEDAN CITY
136	Delsina Faiza, Thamrin, Ahmaddul Hadi, Yongki Saputra	ELECTRONIC COMPONENT TESTER AS A LEARNING MEDIA FOR CLASS X STUDENTS AUDIO VIDEO ENGINEERING SMKN 1 SUMBAR
137	Yocky Syaida Adha Putra, Tengku Ahmad Fauzan Syah	SOIL STABILITY USING CEMENT PCC IN LUBUK MINTURUN PADANG, INDONESIA
138	Suparno, Bulkia Rahim, Zonny Amanda Putra, Junil Adri, Jasman	LEARNING RESPONSE OF JOURNEY LEARNING COOPERATIV LEARNING AND LEARNING MODULE IN EDUCATION MEDIA LEVEL
139	Wahyudi	RESOURCE SHARING–BLENDED PROJECT BASED LEARNING (RS-BPBL©) MODEL DEVELOPMENT IN VOCATIONAL HIGH SCHOOL
140	Ansosry, Adree Octova, Dedi Yulhendra	STUDY MODELING MANAGEMENT OF MINING IN DISTRICT SOLOK SUMATERA BARAT
141	Eko Hariyanto, Solly Ariza Lubis, Zulham Sitorus, M. Iqbal	THE DESIGNING OF THE PROTOTYPE OF THE AIR QUALITY MEASURING HELMET
142	Elfizon, Syamsuarnis, Oriza Candra	THE EFFECT OF STRATEGY OF TRAINING MODELS IN LEARNING ELECTRICAL INSTALLATION
143	Elin Haerani	SOFTWARE DEVELOPMENT OF CONCENTRATION SELECTION WITH INTEREST TEST BASED ON INTELLIGENT SYSTEM
144	Estuhono	BASED INSTRUCTION (PBI) MODEL ON ENERGY RESOURCE MATERIAL INTEGRATED TO ENERGY SAVING CHARACTER
145	Habibullah, Irma Husnaini, Asnil	FUZZY LOGIC BASED CONTROLLER FOR BUCK CONVERTER
146	Idi Jang Cik	STRATEGY, THE EFFECTIVENESS OF THE IMPLEMENTATION E-LEARNING PROCESS IN SUPPORT LEARNING

147	Indra Irawan	ART EDUCATION THROUGH FREE EXPRESSION APPRECIES, DISCIPLINE SCIENCE, AND MULTICULTURAL AS EFFORTS TO IMPROVE STUDENT CREATIVITY
148	Muharika Dewi	DEVELOPMENT OF NET ENTREPRENEURSHIP LEARNING MODEL FOR UNIVERSITAS NEGERI PADANG
149	Mukhidin, Tuti Suartini, Bachtiar, Aan Sukandar	IMPLEMENTATION OF MODEL-BASED LEARNING ISO/IEC 17025 IN VOCATIONAL HIGH SCHOOL
150	Mulianti, Ambiyar, Generousdi and Rodesri Mulyadi	MEASUREMENT MODEL OF CONTRIBUTED FACTOR AND INDICATOR TOWARDS VOCATIONAL EDUCATION PRODUCTIVITY
151	Mulianti, Suhendrik Hanwar, Generousdi and Budi Syahri	MODELING FACTORS AFFECTING THE POLYTECHNIC GRADUATE COMPETENCE
152	Indra Wahyu, Fahmi Rizal, Rijal Abdullah	THE INFLUENCE OF USING ANIMATION MEDIA AND LEARNING MOTIVATION TOWARD LEARNING RESULT OF AUTOMOTIVE STUDENTS IN SMK N 2 PAYAKUMBUH
153	Ungsi A.O.Marmai	ROLE REINFORCEMENT OF LPTK PTK IN IMPROVING VOCATIONAL TEACHERS' QUALITY IN INDONESIA AT SMK N 5 PADANG
154	Yaslinda Lizar, Asriwan Guci	BUILD AND DESIGN OF BUSINESS INTELLIGENCE UNIVERSITY SYSTEM AS DECISION SUPPORT ACADEMIC
155	Wakhinuddin S, Bahrul Amin, Waskito	DEVELOPMENT ASSESSMENT MODEL TO HIGH ORDER THINKING SKILL ORIENTATE FOR EVALUATION STUDENT COMPETENCY
156	Romel, Hefri, Syahrul, Arwizet, Syahril	INFLUENCE OF PRELIMINARY TREATMENT ON MAKING COCONUT FIBER PARTICLE BOARD TO BENDING STRENGTH AND IMPACT
157	Sanusi, Nandar Cundara C	DEVELOPMENT OF INDUSTRIAL STATISTICS MODULE USING PROJECT - BASED LEARNING (PjBL) APPROACH
158	Rusnardi Rahmat Putra, Junji KIYONO and Aiko FURUKAWA	PREDICTED vulnerability Assessment of non Engineered houses based on damage data of the 2009 padang EARTHQUAKE IN Padang city, indonesia
159	Titi Sriwahyuni, Dedi Irfan, Ika Pharma Dewi dan Hanny Maharani	DEVELOMPENT OF WEB-BASED DECISION SUPPORT SYSTEM FOR SCHOLARSHIP RECIPIENTS SELECTION USING ANALYTICAL HIERARCHY PROCESS (AHP) METHOD
160	Nelvi Erizon, Irzal, Jasman, Bulkia Rahim, Junil Adri	THE DEVELOPMENT OF WIND SAVONIUS WIND BLADE SYSTEM AS A ELECTRICAL GENERATOR EQUIPMENT
161	Eka Mariyanti, Rasidah Nasrah	THE EFFECT OF ISLAMIC WORK ETHICS AND SPRITUAL LEADERSHIP ON EMPLOYEE'S COMMITMEN IN PADANG SHARIA HOTELS
162	Yeka Hendriyani, Nurindah Dwiyani and Vera Irma Delianti	THE DEVELOPMENT OF OBJECT ORIENTED PROGRAMMING JOBSHEET USING ADDIE MODEL

163	Riki Adriadi, Ganefri and Fahmi Rizal	EMPLOYEE PRODUCTIVITY IN TWO CROSS CULTURES BASED ENTREPRENEURSHIP
164	Sri Wahyuni, Kana Saputra Saragih, Mochammad Iswan Perangin-Angin	THE IMPLEMENTATION OF DECISION TREE ALGORITHM C4.5 USING RAPIDMINER IN ANALYZING DROPOUT STUDENTS
165	Tyas Asih Surya Mentari, Murni Astuti, and Linda Rosalina	DEVELOPMENTAL OF MEDIA LEARNING BASED ON TUTORIAL VIDEO AT CHARACTER MAKE UP SUBJECT IN SMKN 6
166	Wenny Marthiana, Suryadimal, Edi Septe, Duskiardi, Andika	THE APPLICATION OF SIMPLE STRAIN GAUGE DYNAMOMETER IN LEARNING STYLE CUTTING LATHE
167	Yuliarma	MODEL OF DESIGN DESIGN OF ACULTURATIVE SULAMAN MINANGKABAU IN LEARNING DESIGN VARIOUS DESIGN
168	Wakhinuddin S, Donny Fernandez, Andrizal, M Nasir, Rifdarmon	USE OF GEARBOX VIAR ON FISHING SHIPS
169	Mulya Gusman, Totoh Andayono, Dedi Yulhendra, Adree Octova	THE EFFECT OF TOTAL RESISTANCE AND SPEED TO FUEL CONSUMPTION OF DUMP TRUCK HD 465-7 IN COAL MINING
170	Yasdinul Huda, B Herawan Hayadi	SMART CLASSROM DESIGNS IN THE SMART EDUCATIONAL ENVIRONMENT
171	Jusmita Weriza	PATIENT INFORMATION SYSTEM DESIGN ON MATERNITY HOSPITAL RESTU IBU PADANG
172	Rasinov Chandra, Mawardi, Anggi Aprianto, Reza Rahmadani	AUTOMOTIVE DEPARTMENT STUDENT PERCEPTION ON LECTURER COMPETENCIES, LEARNING FACILITIES, AND LEARNING MEDIA TO LEARNING ACTIVITIES
173	Edidas dan Legiman Slamet	CREATE A MICROCONTROLLER TRAINER KIT ON MICROCONTROLLER SYSTEM COURSE
174	Edidas, Legiman Slamet dan Ilmiyati Rahmy Jasril	MICROCONTROLLER SKILL TRAINING FOR SMKN 2 PAYAKUMBUH AND SMKN 1 SUNGAI RUMBAI
175	Liliana, Afriani, Anwardi	OPTIMIZATION OF EXTERNAL LIGHTNING PROTECTION SYSTEM DESIGN IN BUILDING CENTER FOR INFORMATION TECHNOLOGY AND DATA BASE (PTIPD) UIN SUSKA RIAU
176	Safrian Aswati, Saleh Malawat, Suhendra, Iskandar, Yessica Siagian, Arridha Zikra Syah	PERSONNAL MANAGEMENT IN INFORMATION SYSTEMS APPLICATIONS WITH TOGAF FRAMEWORK

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THE DESIGN OF LECTURER PERFORMANCE EVALUATION MODEL BASED ON ANALYTIC NETWORK PROCESS (ANP)

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Abstract: One effort to improve the quality of higher education is a service to students, to improve the quality of lecturers. In an effort to develop the quality and career of a lecturer, then the lecturer's performance is important to be evaluated to get the right information. Most lecturer performance evaluations are generally limited only from the assessment of the students on the learning process in the classroom. In this research, an evaluation model using Multi Criteria Decision Making (MCDM) is designed to evaluate the lecturer's performance of factors affecting lecturer performance problems. Factors that affect the performance of lecturers will be seen from the variables of motivation, self-esteem, competence and job satisfaction. To reflect the correlation of dependence between factors on lecturer performance evaluation is proposed by using Analytic Network Process (ANP) method which is one of MCDM technique. ANP method is considered capable to present the level of importance of various parties by considering the various criteria and sub criteria that exist and can be used to build a prediction of human resource performance measurement based on weighting factors affecting the performance of lecturers. In this research expected to produce an effective lecturer performance evaluation model that can support decision making for lecturers quality development.

Keyword: Lecturers-Performance, Motivation, Self-esteem, Competence, Job Satisfication, ANP, MCDM

1. INTRODUCTION

In Undang-Undang No. 14 Tahun 2005 About Teachers and Lecturers Pasal 1 ayat (2), that the lecturer is an educator who must be professional and scientist with the main task of transforming, developing and disseminating science, technology and art through education, teaching and community service. One of the important qualities to be considered in universities is the human resources of students, lecturers and staff [1]. This shows the role of lecturer which is very important in the implementation of teaching and learning process.

Globalization and the Asian Economic Community (AEC), a great effect on employment and enhance competition in search of work. Every citizen who are members of the AEC-free into the workforce in the countries that are members of ASEAN [2]. It makes people more aware of the importance of education, and expected the process and product development are high-quality education that can compete both nationally and internationally.

The phenomenon of the quality of lecturers in college up to now is still a concern of many parties. As revealed by Suryadi (2008) and Jalal (2009) that the universities in Indonesia in general face a similar case in the issue of qualifications, competence and commitment of human resources [3]. The existence of low quality paradigm of lecturer, dedication and lack of mastery of subject matter taught to be the cause of our underdeveloped education with other countries.

Many factors can affect the performance of lecturers in carrying out their duties in universities. The performance of lecturers can be influenced by motivation, work environment, job satisfaction, job leadership, and cultural views on lecturer performance [4], [5]. There are significant and significant correlation between competence, motivation, personality, job satisfaction on performance [6], [7]

Fuzzy based methods such as AHP and ANP [8], [9], [10], [11], is a technique that is considered capable to solve the problem of decision making with many criteria. Evaluation of performance by adding an engineering point for the evaluation process with the approach of Multi Criteria Decision Making (MCDM) using the Analytical Network Process (ANP) and Choquet Integral (CI) showed an efficient way to handle the quantitative and qualitative data simultaneously.[12]

This research aims to design a faculty performance evaluation model in terms of factors suspected to affect the performance of lecturers such as motivation, self-esteem, competence and job satisfaction with the ANP method is one technique MCDM. ANP method is considered capable to present the level of importance of various parties by considering the various criteria and sub criteria that exist and can be used to build a prediction of human

resource performance measurement based on weighting [13]

2. LITERATURE OVERVIEW

Job Performance or Actual Performance shows the performance of human resources in the form of work results in quality and quantity achieved by a worker, in accordance with his duties and responsibilities given to him. Each lecturer must have a criterion as an educator who aims to assist within *1) improve performance, capabilities, and output of educational, 2) facilitate communication and exchange of information on best educational practices with various types of educational institution, and 3) as a tool for understanding and improving performace of education institutions as well as guidance in strategic planning* [14]

The success of a person's performance is a combination of ability, effort and opportunity that can be assessed. As pointed out performance can indicate function of the interaction between the ability or abilities (A), motivation (M), and opportunity (O), and can be formulated; Performance = f (A x M x O). Meaning: performance is a function of ability, motivation and opportunity. [15]

Performance of a lecturer is the result achieved by the lecturer in carrying out its duties and functions in accordance with Tri Dharma Perguruan Tinggi. Performance is seen from achieving the tasks assigned to the lecturer based on the skills, skills, experience and seriousness and time with the resulting output reflected by the quantity and quality**.**

2.1. Dimension of Lecturer Performance Evaluation

In [16] "*Motivation is a process that starts with a physiological or psychological deficiency or need that activates behavior or a drive that is aimed at a goal or incentive. Thus, the key to understanding the process of motivation lies in the meaning of, and relationship between, needs, drives, and incentives*". Motivation of work is the desire that encourages or motivates the lecturer to do his job. Motivation of work is a strong impulse so that the lecturer to do his job to achieve the goals of achievement and job satisfaction.

Job satisfaction is a picture of the feelings, or emotional or affective response of a worker to the situation and working conditions that can meet everything related to the needs and expectations faced by workers in looking at the work and results obtained. Job satisfaction not only from one aspect but also reflects a person's attitude towards his job. A person can be relatively satisfied with one aspect of the job and not satisfied with one or several other aspects or vice. Luthans (2002) divides job satisfaction in 3 aspects ie: (1) *Job satisfaction a kind of employee responds to condition of working*

envirotment, (2) *Job satisfaction is offeten assessment based on work output of performance*, and (3) *Job satisfaction relateds to the attitudes perforamnce by every employee* (Arifin, 2015:39).
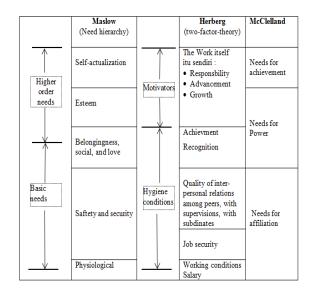

Fig. 1 Adaptation Comparison of Motivation Theory [17]

Self-esteem we refer to the evaluation which the individual makes and customarily maintains with regard to himself : it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful and worthy [18] *In short, self-esteem is a personal judgment of worthiness that is expressed in the attitudes the individual holds toward himself*. Self-esteem in this research relates to self-reliance of lecturers based on four aspects of Coopersmith concept which includes significance, power, virtue and competence**.**

In [19], "*A competency is an underlying characteristic of individual that is causally related to criteria on referenced effective and/or superior performance in job situation*". PP No. 19 Tahun 2005 on National Education Standards Pasal 28 affirms that educators are learning agents that must have four types of competence, namely pedagogic, personality, professional and social competence. This is in line with the dimensions of competence Spencer and Spencer have presented as follows;

1) Pedagogic competence in accordance with achivement and action,
2) Professional competence is similar to cognitive,
3) Personal competence in accordance with the impact and influence) and personal effectiveness
4) Social competence in accordance with the helping and human service and managerial.

2.2. *Analytic Network Process* (ANP)

2.2.1 Concept of ANP

The ANP method is the development of the Analytic Hierarchy Process (AHP) method, which has a higher complexity than AHP. ANP method is one method that is capable of presenting the level of interest of various parties by considering the interplay of criteria or alternatives in making decisions related to a range of interconnect and depensi [13].

Saaty stated that in the implementation of ANP problem solving depends on alternatives and criteria that exist [12] [20]. ANP analysis uses pairwise comparison on alternatives and criteria. Next [13] explain the network in the AHP there is a level of objectives, criteria. Levels in AHP are called clusters in ANP networks that can have criteria and alternatives in them called nodes. ANPs are formed in the network structure and there are also feedbacks, which can improve the priority generated from the assessment and can make predictions more accurate. In addition, the criteria themselves can depend on alternatives and on each other feedback fixes the priorities generated from the assessment, and makes predictions more accurate.
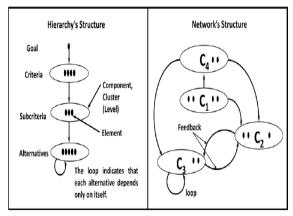

Fig.2 AHP & ANP Component Type [13]

The ANP calculation process, based on the priority of each cluster depicted in the n x n matrix, gives a paired pair ratio scale. If the system has N clusters, where elements in each cluster can interact with some or all of the existing cluster. The cluster is denoted by Ch (h = 1, 2, 3,..., N) with elements of nh (eh1, eh2, eh3 ...., ehn). Value of supermatric awarded as a result of the assessment of priorities derived from pairwise comparisons.
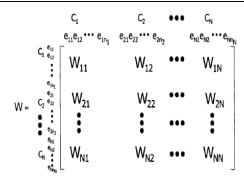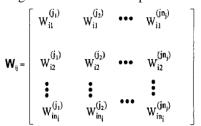

Fig.3 Basic format of Supermariks

Fig. 4. Matriks Block i and j

2.2.2 ANP Stages

Stages in making decisions using the ANP method [13] :

Stage 1: Develop problem structures and develop decision models, aimed at identifying the alternatives that will be most significant in decision making.

Stage 2: A matrix of pairwise comparisons interrelated variables, to calculate the impact on the alternatives are mutually compared by measuring the ratio scale of 1 to 9.

Table. 1 Scale of Absolute Numbers

Intensity of Importance	Definition
1	Equal importance
3	Moderate importance
5	Strong importance
7	Very strong importance
9	Extreme importance
2,4,6,8	Intermediate values

Step 3: Calculate supermatrixs (weighting element), with the value of the reciprocal (inverse), ie aij = 1 / aij indicates the level of importance of the element of i or j. Consistency ratio should be <= 10%. If the value is more than 10%, then the assessment of decision data should be corrected.

$$A * w = \lambda max * w \qquad (2.1)$$

Stage 4: Determine the weight of interest using the limited supermatrixs of the model.

$$CI = \frac{\lambda\,max - n}{n - 1} \qquad (2.2)$$

CI = Consistency Index
$\lambda_{max\,I}$ = Max eigen value

n   = number of elements compared

3. CONSTRUCTION OF THE MODEL
3.1. Problem Definition

In planning development and coaching to improve lecturer's performance hence very important to conduct evaluation of lecturer's performance. Evaluation of lecturer performance is generally from questionnaires filled by students related to the learning process. Therefore, it is important for lecturers to conduct self-evaluation based on factors that are suspected to affect lecturer's performance. Model of lecturer performance evaluation in this research is designed based on the factors that allegedly affect the performance of lecturers with the variables of motivation, self-esteem, competence and job satisfaction.

Most models have been used in performance evaluation, assessment, as well as social studies using statistical methods by increasing or decreasing some variables, rarely developing models with analytical methods. This study aims to produce a flexible lecturer evaluation model design using MCDM approach with ANP method.

3.2. Problem Criteria

The lecturer's performance evaluation criteria in the study consisted of lecturer performance, work motivation, self-esteem, competency and job satisfaction. Each criterion has several sub-criteria as follows:

- Lecturer performance criteria (KD),
- Motivation Criteria (M), this cluster consists:
  - Needs for achievement (MAc)
  - Need for power (MP)
  - Needs for affiliation (MAf)
- Self-Esteem Criteria (SE) :
  - Respecfull Power (SEP)
  - Significance (SES)
  - Virtue (SEV)
  - Competence (SEC)
- Competence Criteria (C) :
  - Pedagogig (CP)
  - Personality (CK)
  - Social (CS)
  - Professional (CPro)
- Job Satisfaction Criteria:
  - Enjoyment to work (KKS)
  - Satisfaction on the work (KKH)
  - Award of work (KKP)

Alternative selection of priority strategy decisions:

- Alternative 1: Guidance and facilitation of lecturers, by developing competence and career.
- Alternative 2: Optimizing lecturers' performance by developing lecturer career patterns with rewarding and measurable compensation and transparency.

- Alternative 3: The deepest coaching pattern required improves lecturers' ability to focus on learning and teaching.

3.3. Proposed Model

Figure 3 shows a network model framework designed by ANP method. All criteria and sub criteria are associated with each factor in evaluating the lecturer's performance. All criteria and sub criteria are associated with each factor in evaluating the lecturer's performance.
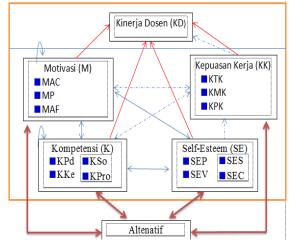

Fig.5 Proposed Model Evaluation

The relationship between criteria and sub-criteria:
- ⟶ The direct influence of criteria on KD
- ⤍ Shows the relationship indirect effect through KK criteria against KD
- ⟷ Showed a correlation between the criteria
- ⟷ Alternative selection decisions based on the results of weighting
- ↻ Dependency between elements of the criterion (inner dependence)

The lecturer's performance evaluation model based on the ANP method, forming a network that allows to illustrate some problems without focusing on beginning and ending.

4. CONCLUSION

Performance appraisal is the process of determining one's performance level. To obtain information about the performance of a lecturer then it is important to do performance evaluation in accordance with the duties and functions as an educator.

Lecturer performance evaluation model based on ANP able configure to measure direct and indirect influence and correlation between lecturer performance factors, motivation, self-esteem, job satisfaction and competence. The designed model does not close the possibility to be developed based

on the addition or subtraction of other performance factors.

5. ACKNOWLEDGMENT

This research is still limited to the design of lecturer performance evaluation model. Further research is needed to calculate weighting, supermatrix, limiting supermatrix and limiting prioritie and perform testing of lecturer performance evaluation models designed.

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