



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

No	Author	Article
1	Asrul Huda, Rendy Harisca	DEVELOPMENT OF EMPLOYEE INFORMATION SYSTEM-BASED WEB IN MAN 1 PADANG
2	S Syaukani, M Bahi, M Muslim, M Shabri Abd Majid, D Sutekad, Y Yasmin, N Novita	TWO SPECIES OF TERMITE DAMAGING TO BUILDING AND HOUSES AT BANDA ACEH (SUMATRA, INDONESIA)
3	Harleni	ACADEMIC INFORMATION SYSTEM OF STIKES PERINTIS PADANG
4	Eko Indrawan	REVIEW DEVELOPING OF PROJECT BASED AS INNOVATION INSTRUCTIONAL
5	Budi Syahri, Primawati, Syahrial	IMPROVING LEARNING MOTIVATION THROUGH IMPLEMENTATION PROBLEM SOLVING LEARNING STRATEGY
6	Juli Sardi, Hastuti, Ali Basrah Pulungan	OF BODY'S BIOELECTRICAL IMPEDANCE By USING THREE ELECTRODES
7	Toto Sugiarto, Dwi Sudarno Putra, Wawan Purwanto	EFFECT OF ENGINE TEMPERATURE CHANGES ON INJECTION TIME OF FUEL AND GAS EMISSION OF GASOLINE ENGINE
8	Hastuti Marlina, Reno Renaldi	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
9	Asyahri Hadi Nasyuha, Rahmat Sulaiman Naibaho, Saniman	DECISION SUPPORT SYSTEM (DSS) WITH WP AND MFEP METHODS IN SELECTION OF BEST BABY CLOTHES
10	Arif Rahman Hakim	MODIFICATION OF INPUT PUSHER ASSEMBLY OF LASER MARKING MACHINE
11	Akmam, Amir Harman, Putra, Amali, Resi Elfitri	OPTIMIZE OF LEAST-SQUARE INVERSE CONSTRAIN METHOD OF GEOELECTRICAL RESISTIVITY WENNER-SCHLUMBERGER FOR INVESTIGATION ROCK STRUCTURES IN MALALAK DISTRICTS OF AGAM WEST SUMATRA
12	Nurzamaliah Afifah, Ambiyar, Yufrizal. A	THE INFLUENCE OF PROJECT BASED LEARNING TOWARD ELECTRICAL MACHINE AND ENERGY CONVERSION STUDENT ACHIEVEMENT OF VOCATIONAL HIGH SCHOOL 1 PADANG
13	Kms. Muhammad. Avrieldi, Suparno, Nofri Helmi	THE EFFECT OF SOFTWARE MASTERCAME TOWARD MECHANICAL ENGINEERING STUDENTS PERFORMANCE IN MAKING PRODUCT WITH CNC MILLING MACHINE IN VOCATIONAL HIGH SCHOOL 1 PADANG
14	Fivia Eliza, Dwiprima Elvanny Myor, Hastuti	THE VALIDITY OF TRAINERON MATERIALS SCIENCE AND DEVICESUBJECTAT DEPARTMENT OF ELECTRICAL ENGINEERING

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 IN BIOLOGY 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	RELATION DRAG 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 GENERATOR TITLE
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 PERFORMANCE
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	<i>RAHMATAN LIL ALAMIN</i> , 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 DEVELOPMENT 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 SKILLASSESSMENTIN COMPUTER NUMERICAL CONTROL PROGRAMMING SUBJECT
57	Edi Septe, Suryadimal, Wenny Marthiana, Nizwardi Jalinus, Ramli	CONDUCTING LABOR MARKET ASSESSMENT IN ENGINEERING CURRICULUM DEVELOPMENT
58	Safрил, Dedi Wardianto	ANALYZING OF TECHNICAL CUTTING OF EMPTY PALM BUNCHES
59	Waskito, Zonny Amanda Putra, Surfa Yondri, Rahmat Aziz Nabawi, Viky Prasetyo 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. Maward 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 QUIZ 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 OF TOOLS PRACTICE 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 FACILITIES

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 APPRECIATES, 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	DEVELOPMENT 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 SPIRITUAL LEADERSHIP ON EMPLOYEE'S COMMITMENT 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 CLASSROOM 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	PERSONAL MANAGEMENT IN INFORMATION SYSTEMS APPLICATIONS WITH TOGAF FRAMEWORK

STUDENT COMPETENCY MODEL OF VOCATIONAL HIGH SCHOOL

Fahmi Rizal, Rijal Abdullah, Juniman Silalahi and Yuwalitas Gusmareta
Faculty of Engineering, Universitas Negeri Padang, Indonesia

ABSTRACT:

This study aims to reveal a model of vocational student competency. Student competence model is important to be studied in order to find the dominant factors that influence the competence of vocational students. The development of science and technology has led to various factors that allegedly dominant influence the competence of vocational students. In this research, a student competency model involving three exogenous variables, namely Basic Literacy, Learning Skill, and Character Quality; while the endogenous variable is the Vocational Student Competency. Respondents of the research were 438 students of 9 state vocational schools scattered within the province of West Sumatra. The data were analyzed using SEM techniques, and the results showed that, except for Financial and Cultural Literacy Indicators in Basic Literacy variable, the three exogenous variables significantly influence Vocational Student Competency. So, it can be concluded that Basic Literacy, Learning Skill, and Character Quality altogether significantly influence Vocational Student Competency.

Keywords: Vocational Student Competency, Basic Literacy, Learning Skill, and Character Quality.

1. INTRODUCTION

Indonesia has a large population potential of 255,182,144 people (BPS, 2016). The main assets are very important in the nation's development. However, if not supported by good quality of human resources, the valuable asset will be a national burden. Human resources play an important role in every movement of development. Until today the quality of Indonesian human resources has not met expectations. One of the factors affecting that low quality of human resources is low quality of education, while the competition is getting tighter in the world globalisation.

To address the above challenges more attention should be given to education sector, especially education that produces human resources ready to enter the workforce. Vocational education has a strategic role in producing competent graduates. Along with the concept, the government has paid serious attention to revitalizing vocational education. Realizing that high quality human resources can accelerate the nation's development, the government has issued Presidential Instruction

No. 9/2016 on the revitalization of Vocational High School (SMK) in order to improve the quality and competitiveness of Indonesian human resources.

Vocational education aims to prepare learners to be ready to work in the field relevant to their abilities and skills. The skills and abilities are gained by learners through theory and practice during their studies in vocational schools. Vocational High Schools or Sekolah Menengah Kejuruan (SMK) is closely related to the industry because its large contribution in producing industrial employees.

By improving the quality of learning process in SMK, it was believed that the quality of industrial workforce will be increased, and in turn it will increase the national economic growth.

Reflecting to other countries such as the United States, France, Korea, Australia, and China it can be said that their economic progress is supported by reliable human resources as a result of education, especially vocational education. They are considered as

successful countries in managing the human resources as the result of vocational education.

The quality of human resources which graduate from vocational education was influenced by many factors, such as curriculum, educator, learning process, facilities and infrastructure, tools and materials, school management, and school environment. Therefore, in order to produce competent graduates, vocational school leaders need to focus their attention on the process of learning when students are educated and forged in school. To support the process, information about the determinants of the competency of vocational school students needs to be disclosed. Several models of student competence have been studied, but special research on competency model of vocational school students in accordance with the progress of science and technology is still rare.

Broadly speaking, the competence of vocational school students includes knowledge, skills, and work attitude owned by students must meet the need or requirement of industry. Furthermore, today's challenges for vocational students rapidly increase following the rapid progress in the industrial field. One of the dominant factors, that influence it, is the advance of science and technology itself. In addition, the needs factor has to be considered, for example, societal needs, industrial needs, professional needs, vision needs, and scientific needs. In this global era, skills become a key factor in the development of student's vocational competencies. It was called "Four C" stand for Critical Thinking, Creativity, Communication, and Collaboration.

According to Baso (2003) competence is a major skill, knowledge, and attitude needed to achieve effective performance in workplace . Furthermore, Spencer & Spencer (1993), defines competency as an underlying characteristic of an individual that is casually

related to criterion-referenced affective and/or superior performance in job situation".

Griffin et al. (2012) in a book entitled Assessment and Teaching of 21st Century Skills reveals four groups of skills, namely Ways of Thinking, Ways of Working, Tools for Work, and World Life Skill. The ways of thinking include creativity and innovation, critical thinking, problem solving, decision making, learning how to learn, and metacognition. Ways of Working includes communication and collaboration or cooperation. Tools for Work includes information and information technology and communication skills. Then World Life Skills include citizens' awareness, career and life, personal and social responsibilities including cultured awareness.

From another point of view, Trilling and Fadel (2009) initially classified 21st century skills into three factors, namely learning skill (critical thinking, creative thinking, collaboration, and communication); proficiency (information literacy, media literacy, and technology literacy); and life skills (flexibility, initiative, social skills, productivity, and leadership).

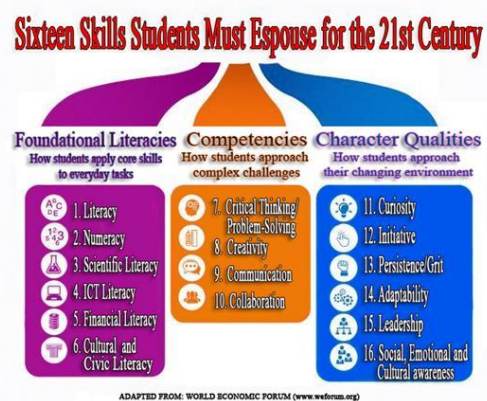


Fig. 1 The 21st Century Competency

Figure 1 shows the new developments in the formation of student competencies that

surfaced in the World Economic Forum (2017) determined by several skills covered in three main factors. First, the Basic Literacy factor refers to how students apply core skills (read, write, and count) in everyday life. Second, the "competencies" factor refers to how students approach when faced with challenges. Third, the Quality of Character factor refers to how the student approaches when facing environmental change.

Based on the above explanation, the implementation of SMK must consider various important factors or variables. The question that must be answered immediately is how to model the competency of vocational students who can anticipate present and future challenges. Therefore, this study aims to answer this last question, which reveals the model of competence of vocational students. It is expected that this research can produce a competency model of vocational students that presents empirical evidence of factors or variables determining the competence of SMK students to face challenges in the global era for the present and the future.

The problem statements in this research are:

- Whether or not Basic Literacy, Learning Skills, and Character Quality influence the competence of vocational school students?
- Which one of the three variables has the greater impact on student competence?

2. method

This quantitative research was conducted at SMK (Vocational High School) in West Sumatera. In this study there are 2 types of variables, endogenous variables, namely the competence of vocational students. Exogenous variables in this study are all factors that participate in determining or influencing latent variables, namely Basic Literacy (BL), Learning Skills (LS), and Quality Character Quality (CQ); meanwhile the endogenous variable was

Student Competency (SC).

The research population is a student of SMK in West Sumatera, and sample are 438 students taken from 9 SMK which is randomly selected, they are: SMKN 1 Padang, SMKN 5 Padang, SMKN 1 Sintoga, SMKN 1 Pariaman, SMKN 2 Solok, SMKN 1 Bukittinggi, SMKN 2 Payakumbuh, SMKN 1 Guguk, and SMKN 1 Lintau Buo.

The data were collected by using questionnaires and observation. Statistical computer program used in this research is PLS (Partial Least Square) was used to analyze the research data. The relationships among variables are described in the structural model, and PLS was used to determine whether the endogenous variables influence exogenous variable.

3. RESULTS AND DISCUSSION

3.1 Variable Description

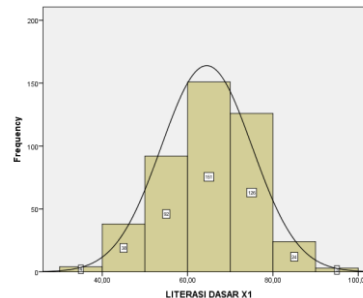


Fig.2 Histogram of Basic Literation

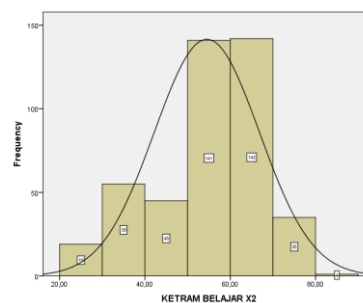


Fig.3 Histogram of Learning Skill

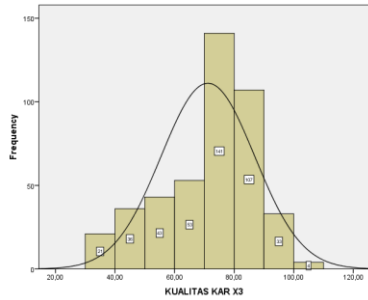


Fig.4 Histogram of Character Quality

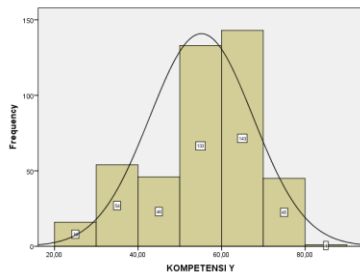


Fig.5 Histogram of Student Competency

Figure 2 to 5 above shows the histogram of all variables included in this research.

Table 1 Variables Statistic

Variables	Mean	Min	Max
BL	64,47	33	91
LS	54,52	20	80
CQ	71,17	30	102
SC	55,19	22	80

Note: BL=20 items; LS=16 items; CQ=21 items; and SC=16 items

Because the number of different questionnaire items between variables, then percentage of achievement level of each variable are as follows: BL (64,47), LS (68,15), CQ (67,78), and SC (68,99). Comparing these four variables, it could be stated that highest score is SC, followed by LS and CQ, meanwhile BL is the lowest.

3.2 Analysis of Vocational Student Competency Model

The following will present the results of the model analysis. The first stage is the measurement model which is required for the proposed Vocational Student Competency model. The first stage analysis showed that BL variable contains nine items which was not valid. Then for the variable LS and CQ contains one bad item. Finally for the SC variable there are four items that are not valid.

Table 2 Loading Factors for Each Variable

BL	LS	CQ	SC
0,806	0,767	0,503	0,880
0,759	0,845	0,755	0,906
0,869	0,826	0,756	0,693
0,584	0,703	0,729	0,864
0,538	0,759	0,730	0,901
0,624	0,587	0,745	0,894
0,601	0,716	0,767	0,871
0,513	0,527	0,634	0,876
0,728	0,693	0,572	0,708
0,797	0,755	0,791	0,649
0,705	0,846	0,827	0,627
	0,799	0,779	0,778
	0,840	0,842	
	0,746	0,687	
	0,864	0,633	
		0,584	
		0,814	
		0,754	
		0,826	
		0,799	

Valid items for the BL variables are 11 items, namely X1, X2, X3, X4, X5, X7, X9, X10, X11, X13, and X15. Then for the LS variable there is one bad item, that is X27, and for CQ variable X41 is also not valid. Then the Y12, Y14, Y15, and Y16 item turned out to be bad items in SC variable.

The second stage is the analysis of Vocational Student Competency model itself. After all of invalid indicators were discarded, the result of analysis showed that outer loading value for all remaining indicators > 0.5. Instrument reliability calculated by using Cronbach Alpha formula showed the score above 0,90 for all variables, except BL which has the score of alpha = 0,888.

Table 3 showed the effect of three exogenous variables on endogenous variable.

Table 3 Exogenous Effects

Var	Path Coef.	T-Stat	R Square
BL→SC	0,103	3,178	0,866
LS→SC	0,257	4,495	
CQ→SC	0,594	10,587	

Figure 5 showed the model after final analysis. It could be seen that all three exogenous variables (BL, LS, and CQ) have a significant effect on endogenous variable (SC). Comparing the effect of exogenous variables on Student Competency, it could be concluded that Character Quality (CQ) has the biggest effect among the three exogenous variables. The second was Learning Skill (LS), and the last one was Basic Literasi (BL). Overall, the value of R Square indicates that 86,6 percent of Vocational Student Competency affected by three exogenous variables.

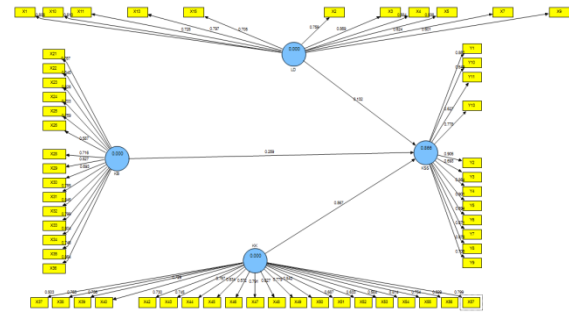


Fig.6 Model of Vocational Student Competency

3.3 Discussion

Character Quality turned out to be the dominant factor in determining the Vocational Student Competency. The Character Quality in this study consists of several indicators, such as: curiosity, initiative, fortitude, adaptation, leadership, and awareness. In accordance with this, Suherman (2008) states that the quality of characters related to affective abilities include self-control, self-awareness, mood management, impulsion control, positive activity motivation, and empathy.

In line with that, the 2013 curriculum emphasizes the affective or character education aspects. The values contained in it includes: religious, honest, tolerance, discipline, hard work, creative, independent, democratic, curiosity, spirit of nationality, love of the homeland, appreciate achievement, communicative, love peace, love to read, caring environment, social, and responsibility. So, if Vocational Student Competency have to be developed, the student's Character Quality must be build firstly.

The second dominant factor is Learning Skill (LS). Learning Skill contains several indicators, and only one item categorized as bad item. This is also the case as Adiningtyas (2010) stated that when students realize how to learn

effectively, so they would be more responsible for the way of learning; and learning skills will support the success of students in learning.

The last factor is Basic Literacy (BL) which contains several indicators, namely Literacy, Numeracy, Scientific Literacy, IT Literacy, Financial Literacy, and Cultural Literacy. Since Cultural Literacy turn out to be invalid indicator, it have to be excluded from the Student Competency Model. None of four items in this indicator was valid. That why the effect of Basic Literacy on Vocational Student Competency become lower compared to two other exogenous variables.

4. CONCLUSION

This research proposed Vocational Student Competency Model including one endogenous variable (Vocational Student Competency) and three exogenous variables, namely Basic Literacy, Learning Skill, and Character Quality. It could be concluded that Character Quality (CQ) has the biggest effect among the three exogenous variables. The second was Learning Skill (LS), and the last one was Basic Literasi (BL). Overall, the value of R Square indicates that 86,6 percent of Vocational Student Competency affected by three exogenous variables.

5. references

- [1] Adiningtyas, Sri Wahyuni. 2010. Meningkatkan Keterampilan Belajar Siswa Melalui Layanan Penguasaan Konten. Sumber: <http://journal.unrika.ac.id/index.php/jurnaldms/article/view/62>. Diunduh tanggal 15 Oktober 2017.
- [2] Baso, Moerad. 2003. Pembinaan SDM Berbasis Kompetensi: Suatu Pendekatan Strategik dalam Upaya Peningkatan Kualitas SDM dalam Konteks Globalisasi dan Otonomi Daerah. *Majalah Manajemen Usahawan Indonesia*. Edisi: No. 2 Tahun XXXII Pebruari 2003. Lembaga Manajemen FE-UI.
- [3] BPS. 2016. Data Pokok Sekolah Menengah Kejuruan (SMK). Sumber: <https://www.bps.go>.

<id/index.php/publikasi/index?Publikasi%5Btahun>. Diunduh tanggal 5 April 2017.

- [4] Patrick Griffin, Barry McGaw, and Esther Care. 2012. *Assessment and Teaching of 21st Century Skills*. New York: Springer.
- [5] Spencer, Lyle M. And Spencer, Signe M. 1993. *Competence at Work: Models for Superior Performance*. New York: John Wiley & Sons, Inc.
- [6] Suherman, Erman. 2008. Model Belajar dan Pembelajaran Berorientasi Kompetensi Siswa. <https://pkab.wordpress.com/2008/04/29/model-belajar-dan-pembelajaran-berorientasi-kompe-tensi-siswa/>. Diunduh tanggal 20 Oktober 2017
- [7] Trilling, Bernie and Charles Fadel. 2009. *21st Century Skill, Learning for Life in Our Time*. San Fransisco: John Wiley and So

