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Recent Research and Issues on Mathematics, Science, Technology, Education and Their Applications


Hijlsh Irwan Iswan Achlan Setiawan Nur Wahidin Ashari Wahyuuddin Bara ZulkifiiRa Rasi Sitti Busfah Muchsio Reviewer Board: Plol Max warshauer (fexas St6t University, USA) hof-Susic Croves (Deakin University, Australia) Prof. Peter Hubber (Deakin University. Australia) Prof. Naoki Sato (Kyoro tJniversity, Japan) Proi Rahanrddin bin Aris (IITM, Malaysia) hof. Ismail bin Kailani(UTM, Malaysia) Prof.

Duangjai Nacapricha (Mahidol University, Thailand) Prof. Muhammad Arif Tiro (State University of Makassar, Indonesia) Pmf. Suratman woro Suprodjo (Gadjah Mada University, Indonesia) Prof. Cufron D. Dirawan (State tlniversity of Makassar, Indonesia) Dr. Fmns van (ialen (IJtcchr University, Netherlands) Dr. SiriNuramaliari Prtono (Thc Indonesian Institute ofSciences) Oslan Jumadi. Ph.D.
HEMATICS, DI{EIR Prelece These proceedings are divided into two volumes, the first volume contains all the papers in the field of mathematics education, science education and its applications, and the second volume contains all the papers in the fields of mathematics, science and its applications.

We hope that everything contained in these proceedings will expand scientific insights while providing new research ideas and innovations to the conference participants and the reader. We would like to thank the authors for contributing their papers, and the reviewers who have provided assessment and feedback during the editing process. We also would like to thank those who have helped the senlement of this proceedings for their contribution.

Makassar, August 2014 All praise be to Allah SWT, because His mercy and blessings, the proceedings of the "International Conference on Recent Research and Issues in Mathematics, Science, Technology, Education and Their Applications (ICMSTEA) 2014" is now finally in our hands. ICMSTEA 2014 was successfully held at Phinisi Building, State University of Makassar on 206 - 21r August 2014 and was attended by 149 parallel speakers and around 450 participants in total who registered and participated from many universities in Indonesia and abroad.

It is assigned to celebrate the 53rd commemoration of State University of Makassar. The conference is organized by the Faculty of Mathematics and Science in conjunction with several committee members from the other faculties within State University of Makassar. The conference is organized by the Faculty of Mathematics and Science in conjunction with several committee members from the other faculties within State University of Makassar. It is assigned to celebrate the 53rd commemoration of State University of Makassar. The conference is organized by the Faculty of Mathematics and Science in conjunction with several committee members from the other faculties within State University of Makassar.
Ladies and gentlemen, on behalf of the conference committee, first, I would like to give welcome to all the delegates, keynote speakers, invited speakers, parallel speakers participants coming today. Welcome to the conference, welcome to State University of Makassar.

I would welcome to Makassar. This conference entitled “International Conference on Recent Research and Issues” and gentlemen, the conference proudly invites eleven keynote speakers coming from several countries. Therefore, I would like to express my sincere thanks to the keynote speakers, including: 1. Professor Max Warshauer (Texas State University, USA) 2.

Professor Naoki Sato (Kyoto University, Japan) 3. Professor Peter Hubber (Deakin University, Australia) 4. Professor Susie Groves (Deakin University, Australia) 5. Dr. Frans vim Galen (Utrecht University, Netherlands) 6. Professor Iruangiai Nacapricha (Mahidol University, Thailand) 7. Professor Baharuddin bin Aris (University Teknologi Malaysia) 8.

Professor Sumatman Woro Suprodjo (Gadjah Mada University, Indonesia) 9. Professor Muhammad Arif Tiro (State University of Makassar) 10. Professor Dr. Siti Nuranraliati Prijono (ITB) 11.

Professor H. Arismunandar, M.Pd. (State University of Makassar) 2. Professor Kristian H. Sugiyano, Ph.D. (State University of Yogyakarta) 3. Professor Sutarto Hadi, lambung Mangkur-at University) 4. Professor Nurdin Noni, M. llum. (State University of Makassar) 5. Professor Yuni Sri Rahayu, Ml.Si. (Sralc University of Surabaya) 6.

Professor Ayuddin M.’1. (State University of Malang) 7. Dr. Irsman Pagalay (State Islamic University of Malang) 8. Dr. Suyanra” M.Si.

(State University of Yogyakarta) q 1). Eliza Ses4 M.Sc. (Tadulako University, palu) Next. I would like also to give sincere thanks and gratitude to the invited speakers, including: 1 I’rl.

I v,i Yo€ FiDr sho lo? ofl Th II, S A \ {r:0tt dar, M.pd. Io give our aken and irersity of 7.1 k is cnference omminee Int m.tion.l Conf.rrccc o lleihcm i6, S.i.n., Tennobgy, f,drctio, r.d lh.ir Applic. rion3 (ICMSTEA) 10tt d(. In this occasion, I would like to thanks to Deputy of Governor of South Sulawesi Province (Ir. H. Agus Arifin Nu’mang, M.Si), Mayor of
Makassar City (Ir. H. Ramdhan Dhany Pomanto), Recto! of t NM (Prof. Dr. H. Arismunandar, M.Pd.), and Director of Post Graduate Program of IINM (Prof. H. Jasruddin Daud Malago), who are very kind to be the host of welcoming dinner and lunch during the conference.

I want to thanks also to Kalia Group, KIA Kall4 Erlangga Press, Opti Lab, and e-Bimbel Yogyakarta for their contribution as the sponsors of this conference. Finally, it is my privilege to thank's to organizing committee mems. who have been showing good work and determination for the accomplishment of this conference. I would like to apologize to all of you when there are some inconvenience things during the implementation of this conference. Thank you and wish you have a meaningful conference. Wassalamu'alaikum Warahmatullahi Wabarakatuh I lcad of (bmmince.

rag from speakers. Suwardi Annas, Ph.J) r Int.rr..ioo.t Cotrf.r..a oD M.th.D.tica. S.i.n... TEBnoloAy. Ed!.rtion.nd th.it APPLic.riori (ICMSTEA) 20l' Foreword from the Dean of Faculty of Mathematics and Science, State University of Makassar Bismi llahirrahmairahim Assalamu' alaikurn Warahmatullahi wabarakatuh Filst of all, let us praise to the Almighty, Allah SWT, because of his Blessings and Helps, we are able to gather here to inaugurate the International Conference on Recent Research and Issues in Mathematics, Science.

Technology, Education and Their Applications (ICMSTEA) 2014. The development of education and technology in recent decades grows very rapidly. In addition, they have been specialized into many specific topics. Indeed, for researchers and lecturers, being qualified of a specific field as well as being aware of the contemporary development of other fields are two crucial things. One of the reasons why we undertake the conference is to fulfill those two things.

By attending the conference, researchers and lecturers have a good opportunity to share their research findings and to obtain broader descriptions of the development of other general knowledge. We convey our deep appreciation and gratitude to all of the committees that work from the beginning to support and organize the conference. We also strongly expect the participants of the conference to be continually productive, increase the capacity in conducting a research, and cardoul both national and international scientific publications.

IjiiDally, let me again recite thank you to fie all participans of the conference who are receptive to spend their time to be present and entirely involved at this event. I wish the conference advantageous for all of us. Billahitautiqwalhidayat. Wa-ssalamu’alaikum Warahmatullahi Wabardkatuh Dean of the Faculty of Mathematics and Science State University of Makassar Prol. Ir. II.
Ilamzah Upu. M.tid. r) 20tt Ina.ro. tionrl Corf.r.lc. on Mitlcrrti.J, S.i.kc., T6h troloay, 
Educaion r.d th.ir Applic.rioss 0cMsTEI) 2or4 Helps, we d I ssucs in 014. apidly. In chers 
and :empora.ay :nake the lecturcrs ptions of liom the Pa-‘ts of rch, and rcePtive lerence 
I'owords frorr Rector of UNM B ismiilahirrahmaninahim Assalamu’alaikum 
Wamhrnatullahi Waba.rakatuh Your respectable, the high officisls of Slate University of 
Makassar, the committee, thc speakers, and the perticipans of conference.

In that celebration, we underlake several agendas including educational aDd spo 
activities. The confererrce, ICMSTEA, is otcr of our educational activitics that covers a 
wide range of ve.y inleresing itcms relating to mathematics, Science, education, 
technology aDd their applications.

Uy laeking panicipolion of this seminar, it is highly expected to all of us to share our 
res€arch findiogs to s&ietv and continuously Dvelop new ideas and knowledge. Those 
things are two significant steps in improving the quality of nations around the world, 
increasing our familirdty to each other. and even avoiding underdevelopment. 
Furthermore, I would like to lake this opportunity to expr€ss my heafJfelt gratitude to all 
organizing comminee especially for the Faculty of Mathematics and Sciencc that 
primatially hosls this conference particularly and otler Dies Natalis events generally.

I’inally, this is a geal time for me to declare thc ofical opening of the International 
Conference on Recent Research and Issues in Mathematics. Science, Technology. 
Education and Their Applications (ICMSTEA) 2014. I wish you a very enjoyable slay in 
Makassar, I warmly welcome you again, as in Makassar, we say 
"salamakbibatturimsngkasala". iVassalarnu’alaikurn Warahmatullahi Wabamkatuh ilcclor 
ofState University of Makassar ProL Dr. H. Arismunandar, M.Pd It gives me a great 
pleasure to extend to you all a very warm welcome, especially to our keynote sp€akers 
who have accepted our invitation to attend the conference. 

[1 is an opportune time to convey to you that trNM is celebrating the 53rd Dies Natalis 
and it comrrods the faculty of Mathematics and Science (FMIPA) to be in charge of all 
activity sequences in the Dies Natalis. However, the suppofl ofother faculties is also 
really-’- influential and gives valuable contribution to the $rcess of the evcnt. 

,i'ABLE OF CON'IENTS Preface Forewords fmm the Head of Cornmitter Irorewords from 
the Dean Iorewords from the Rector Table of Contents l)esigning and Design Rcseauch 
Frans van Galen, Utrecht Univeniity Math works, Math Problems and Math Education 
Research rv.,r, Texas Statc Unvcrsity Job Orietation of Undergraduate Statistics 
Students of FMIPA Univcrsitats Negeri Makassar Mrhammad Arif Tirc, State University of

and i/i/airat, P, Mahidol Unversity Corelation between Structures and Electronic Properties of Organic Scmiconductor thin-films Nooh Sato, Kyoto University SI FM and OtrR to Stimulate Studenf Ingagcment ajuruddin Aris.Univcrsiti I ekonologi Malaysia Representation Construction; A Research Developed Inquiry Pedagogy for Science Ilducarion Itt Itubbel, Deirkin Jrivversity Irorroduction to Modeling for Ccographical Resourroes Management Slrr,tnnnn. Ga.tah \\uada t Univerisly Role ol Biol,-rgical Science in Developing the Scificntic Basis for Sustainable I)veloppmcnt 5rti \uramoliuli l'rijorrrr, The Indoncsian Instttule ol Science (LIPI) III vll vlli 1 4 5 (t 1 8 9 \tl i0 lia..rriloorl Co.(rr.. r,n Mrrtt.r.l.l.6. S.i.it, T..hrolo&/ Edu.rlo..trd ilil Aplicic'tiort (lcMsTf,a)2014 Improving Mathematics Teaching through Lesson Study .Iusie (irovers, Deakin Univesitv a ^t llld!.liorColt r.n.. or Mrtn.nrtlB, S.i.i.c., Tehmlog, Edu.rlo..trd tt.ir Aoplicraion3 0cMsraA)20r4 ;8 Societv Opinion's Regarding Residential House and Its Elvironmt toward Human Basic Need in Makassar (In Review of Physiological and Safety Needs or Sens€ of Security) rlgussalin qirong, Slatc University of Makassar DevelopmeD of Model-Based Learning Visual Media through The Model Four-D Thiagarajan for Expository Writing in Junior High School Aknml Hansa, Ilvamsari Akdah, State University ofMakassar The Factors Affecting Inflation in Indonesia Am+ar Ramli, Sulfaidoh, State University ofS State University of Makassar Y Organ Cells Activity Based onthe Concentration of Ecdysteroid liom Haemolyrnph oMangrove Cmb (S Olivacea Herbs,1979) IlasnidaL yushinlo Fujaya, Dody Dharmowan Trijuho. Chdir Runi, Indonesin Moslem University.

Hasanuddin University Joke Models of Development Result and Benenfls .lokebet Saludung, State University ofMakassar i he Role ofHeavy Metal Fe in Sponges (Poritera) liom Sperronde Archipclago Lydia Melowatv, Krbrior., Pasalr, Paulus Christian University of Indonesia Application of Dynamic Model as Decision Making in Vchicle Emissions Pollution Control at Makassar City Voh.

Ahsan S. Mardr4, State Univerenity ofMakassar Challenges Facing Economic Education in A Free Tnde (ACFI and A(C) \uham ad Azis, State University ofMakassar the Application of [,earning Group Investigation Model to Improvc Students' I-earning Outcome of Agricultural tehnology liducation Depanment vrl"a/4 S.
Ilrdr Anhit (rc$r$TEA) a CHALLENGES FACING ECONOMIC EDUCATION IN A FREE TRADE (ACT'TA AND AEC) Mrhrud Adll Tfsauty of EoorFBic, $rcc Uni*rsity of Mrkas.ss, Gunung Sari Banr Sula*rsi Sd61\ Indonesia- c-m8il addriss: 0zis_fqmm@yrfo.com Ab3trrct Iodon€sia's participallon in iec trade both ACFTA (ASEAN(riD FrEe Trlde A5ia) 8nd thc ASEAN Ecommic Coomunity (AEC) vill hrvc rll impdct rot only on tte donclic rcqromy but also to ttle edu('tioi.l instr*rtrrtioDs. Frc. trade c8l bring opportuniti€s ard bcnsfits hn rnay b. .

threat and loss for each counlry, it is of corsc highly de?ndent on the rc-adimss .id abiliy to enter t!! rade. 'lhe &all€ngc and $e mo.i fiEf.rncnId isqB f$xing .dlrdqul intrtMiorE is a rlaner of lh quality of g.sduics. The era ofiEeE tradc or glob.lizdion era is 'll €ra officrce clrnpcn ion for qu.tity oi qrnlity. Dcvclopmc of edu..rion should bc lbL to adjsur b fhe chatBing dcrDatl& of ttte local cornmunity in a Slobol pc.spoclive. Econornic dr.dion I a field of sudy o.lcorning r the ifiiitrrioml level ihould be .ble to prep.rc rhc studcrti t3 individuals wtro hsvc thc km*ledge ard ditude sprogrirtc to 0re econornic dcvllopnmem of te er& Thc Frposr ot tis \rc rld be refl€61cd in thc curicutu!tr
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To b€ able to r€dizc thaf ssdort3 crn bocrnte caaarDmic agants in aaaaorddrcc with fhc dcrurds oftha filc msker or globalizltio4 reachea$, s cuaric-rrlririt dcvriropcrs &E rcquircd ao der€lop lc&ning dreniatrs 8rd pmfcssiorial ranhrEr so a3 !o pfoducc who are qualified acccording to fte rcquirem€nts. $aduates Kyword3: Challenges for Economic Btucation. I.

htrtodrcчиD! Fre tade as an internatioal agl€ement involving various countries including lrdonesia c$rot bc avoided anyrpre and should not be f€8rrd but wss met with full preparation. Free tradc is a chsllenge srd sn opponunity that should be utilized by all Enics ir thc vrrrious EsDccts of lifq including aspc crs of education. ID this csse strdy should be able to mate rapid chalges acco$ing to the demqrds of rhe tce nrakci thal is abl€ ro Foduca lurtlwr_ hum0n{u8lity-, highly comp.titive, l nnovalivc ard cractive ^ }Trc challenge atd the mosr turd8m€ntd issues frcing thEurerld of educslion is a matter of the quatitv of gradualrs h still low even d€creased. Lorica0oD t-or All (EFA) Globsl Monjtorilg .published in Refod (GMR) in 2008.
Indonesia has decreased EDI systems split assessment scores into three categories, namely the group of counties with high education index (0.950 and above), medium (0.800 to less than 0.950) and low (below 0.800). The group from Indonesia, Malaysia, Philippines, Vietnam, Myanmar and Cambodia are included; the group ranked highest (Reue6 December 31, 2018). Based on the GMR report, the ranking dropped from 58 to 62 on total value obtained EDI Indonesia decreased from 0.936 into 0.935.

Furthermore, based on the ranking of the Human Development Index (HDI) in 2008, Indonesia was ranked among the lowest: Brunei Darussalam 27; China 51; Malaysia 63; Philippines 92; Thailand 88; and Myanmar 128 (UNDP, 2008) shows that the quality of human capital is also better than most other countries, including China as an advanced ASEAN-China Free Trade Area (ACFTA) and ASEAN Economic Community (AEC) which introduced in October 2003, will begin to be implemented in 2015.

Economic education as a field of study or learning at the institutional level education unit. Economic education focusing on how to prepare the subject student as an individual economic actors who have the knowledge and attitudes appropriate to the economic development of its region. The quality of human resources (HR) preparation would be reflected in the curriculum developed and operationalized based on competency standards and individual economic actors as an individual consumer, the manufacturer, distributor or retailer. 2. Dilemastic 2.1.

Economic Education is increasingly felt and the impact on various aspects of life both economically, culturally, and politically. Forming the patterns of community life that is full of intense competition in every field of work, thus requiring the quality of human resources (HR) preparation.
Competition is a principle of our life, the world is ofFr 8nd Ac€ compcriodn, to implement somathing b€tter and bcfcr constantly. The motto c€nairly bettrr tomorrow is the motto of a c4mpetitivc society, which demands that humsls 8t! constntsly chang.ing rcsili€4 elurpraEurial spidt atrd tlave sinc& In s8tfufied with whd w&r echievad (fila, 2006). Furthermore€ Tila!

(2006) ar8ucs h in a life firll of competitions like this cats.t pcoplcS dern rds for $c quanity of Boo& ard s€rvices is slso higher. Only thc qua& ofgoods and services are valued and nedod by the community. Ttre high demands c the qual ty of goods ard services !b ultim8tely 8ff€ct th€ quality dematds of, educasion (schools).

According to Willb Schweke (in Subroto, 2008) dlst educt(b is not ju-si going to give bith to qualiH human rEsoulc€s, but also can give birt b a healthy business climei aooduqvie b economic growlh. Some p,roblems of ccorDtr- educatin in the face of challenges of trc trade, which is the first f,roblem and it purpose of learning mterial, the seood model problem of learning strategies d methods, and the third problem educah , teacher.

The third issue is the determin6 of the smcess of ccommic and cducario- developmen! end things are interrelrt€d d inluence earh other. The educalor^carb. as a speartrcsd cconomic swcess d educatiofi in educationally irErinni- dema.ded morc pmfessional in csrying ttrc learning process so that lcaming G- crcate gnrdustes who can deliver rla changc accoding to developments.

To realize the students becC| economic sectors dnt fir rh€ demands of trade, the teacheB are .equir€d to dwdq l€aming m.terials and process accordinr t the needs of th€ contexl of frle tr* demands. Innovative learning sfi&gir should be able to make the stude s lca 892 l.tard.a Co.krc o rair)rfrrt S.fa.., T..rr.XGL f,d...ai.t .d ll.f Attl.d... (ICMSTf,D T'I' more happy and supportcd wilh thc Istest literatur and materials.

Practical learning media easily created ard supFfted hy technologi and the ability to use 8ppropriate language. Thc Fescnt era is thc crs oftEe trade, the ma*el economic systen or the global economic system. Msrret economic aysEm gives fie€dom of any economnic actors thowhont communities aerqss thc Str& to do economic r€souces most emciertly so Ott t
timer sn aEno6phsrc of contrpctition ir the global mukd. Becausc rhe chsraetcristics of fr€dom to compete for sll the etors are very storlg global economy, the er8 is 8lso knom as the era of lib€rl8l economy. and because therc is a proc€ss towsdrs the liberal cconomic arnosphecrE, also krrovn as economic liberalizsdon (Wahjoedi: 2008).
listening to the present circumstances, it can be interpreted in terms of development economics, it is actually the era of classical economics system development (Adam Smith) is characterized by the presence of individual economic freedom, the full workings of the market mechanism, the demand for efficiency, between individual freedom to compete globally, the role of the state as the dominant feature of a command economy into a decline, and no respect of all trade barriers between countries are more free society. Although economic freedom are very strong coloring everyday life, but this does not mean economic freedom is the only purpose of the social market economy system. According Wahjoedi (2008), there are 6 aspects of the social purpose of a market economy that should get attention by all individual economic actors, business people, and the sovereign of a country.

6th aspect of the social objectives are: economic efficiency, economic justice, economic freedom, economic growth, economic security, and economic stability. (1) Economic efficiency in a market economy, all economic allocation decisions made by consumers and producers in the market. Specialization and international trade will increase productivity and competition. (2) Economic Justice, meaning there is a fair chance people are free to make their own decisions on how to use its resources, though not guaranteed to be successful. Revenue will depend on the value of labor and other resources that can be sold individually. (3) Economic Freedom, understood as private ownership of all kinds of economic resources and allowed individual freedom and control over valued resources. (4) Economic growth, interpreted as an incentive for individuals and businesses to produce more and to avoid contamination of concern in the efficient use of resources. Specialization and capital invested in the education and training of workers have a high concern of the output. (5) Economic security, meaning that in general, individuals are responsible for their own health, decreased ability, housing and income. But here some government programs urddctoken to redire risk and provide improved economic security as an aid for low-income families, unemployment compncept, social security, and job earning programs of government. (6) Economic stability, some unemployment can be tolerated depending on the income source. It's important to note the IG&I government uses financial and tax policies to reduce the unemployment and inflation and pay attention to economic growth.
The development of the global economic system has in determining the development of the data structures of the economy, and accounts for the basic study of economic education for the sake of learning. Therefore, if you want to develop economic education to prepare the next generation of free-bade era, then there are at least four basic science education should be presented in the material economy, namely: fundamental philosophy, economics, microeconomic theory, macroeconomic Thecory, and international economics. Meanwhile, for the sake of the regional autonomy of the region, in addition to the economics mentioned above, also decided to be added to the public economics.

Through public economics, it can be learned that the economic role of government in a free market economy and decentralization there are 4 main roles, namely: the role of allocative, distributive role, the role of regulation, and the role of stabilization. The role of allocation means the role of government in order to create maximum efficiency. The role of distribution means balancing between efficiency and fairness in allocating resources through taxation and distribution services for the public sector, affecting the distribution of income. The role of regulation means making the rules of consumer protection, law enforcement, and others, thus supporting the market economy to run. The role of stabilization is to stabilize the economic system through fiscal policy, monetary policy, and other economic policies to achieve the objectives in controlling inflation and unemployment. The role of education in the face of free trade economic institutions, especially institutions of formal education required to prepare human resources who have the appropriate competence standards.

For Indonesian standards is defined that graduates have the minimum competency in accordance with the standards of the National Qualifications Framework Indonesia (KKNI) at each level of education. Thus economics education as institutions as places where learning is economic should be introduced in each of the economic institutions of society.

What is examined is that the economic processes of economic learning can be mapped into 8 particular structures. These include formal education, family, and others. Things that make the differences in economic capacity is the everyirstiufirx wh. r the learning framework is economic edtrlrion in leming fomfls.

t €aming fomaa Ot preceded to be introduced in each of the economic institutions of society.
ard goverment, so that in can enter into the policv of both local and central government.
Hence the role of the educator can provide input for the determination of local government policies, especially for the benefit of the economy. 2.1. Economic\nEconomic education is very wide and dynamic to allow the development of the idea - C8n t likelihood to that! extemivc ndics of economic education materials is an area of human life activity ("as wide as huD - activity"), and all human life ("ss lorst - human life"). Basically there are two sources of economic education learning materials, which is the source of economic and practical sources.

Sources theoretical, derived from the study of the development of philosophical thought and empirical evidence, namely the analysis of philosophical, rhetorical, applied side, and the Esod of devlopments in economics. Each component is about the analysis of philosophical, rhetorical, applied side, and the Esod of development in economics. Each component is about the analysis of philosophical, rhetorical, applied side, and the Esod of development in economics. Each component is about the analysis of philosophical, rhetorical, applied side, and the Esod of development in economics. Each component is about the analysis of philosophical, rhetorical, applied side, and the Esod of development in economics. Each component is about the analysis of philosophical, rhetorical, applied side, and the Esod of development in economics.

In the latest development of economics that plays an important role in the era of competition, namely microeconomics, macroeconomics, and international trade, and accounting. 2JJ. Model, Srr	Bfo. rcd Lr\rrt Mcrtodt The rpdcl is a conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities. So it is a learning model that describes the conceptual frame that is used as a guideline in conducting the activities.
The role of teacher educators in the education system is especially critical.

Any attempt to improve the educational outcomes cannot be separated from the role of the teacher because the teacher is the key and the central point of any education reform focused on qualitative changes. Because teachers are one of the dominant components in the educational process, the role of the teacher requires attention. According to Fqir (2005), teachers have a central position in the effort to improve human resources.

Although various approaches oriented to the development of Dary students, but the role of the teacher in the learning process is still very dominant. In any kind of education, the quality of human resources is still very important in the creation of quality human resources. In other words, the responsibility of improving the quality of human professional teachers falls on the teacher. Schulman (2008) found that the performance of teachers has an immediate effect on the learning process, meaning that if the performance of the teacher is better, the quality of graduates it produces good results. Sudjono (2002) found that 16% of student learning outcomes are influenced by the teacher's competency in dealing with the details of the teacher's ability to reach the curriculum. 32.43% of students noted subject proficiency contributed 32.38% to the achievement of subject mastery contributed 32.38%, and the attitudes of teachers towards subjects contributed 32.38%.

Cruickshank (1990) found that the performance of teachers has an immediate effect on the learning process, meaning that if the performance of the teacher is better, the quality of graduates it produces good results. Sudjono (2002) found that the performance of teachers has an immediate effect on the learning process, meaning that if the performance of the teacher is better, the quality of graduates it produces good results. Duiker (2001) found that the performance of teachers has an immediate effect on the learning process, meaning that if the performance of the teacher is better, the quality of graduates it produces good results.

Teacher performance is the quality of its graduates. Cruickshank (1990) found that the performance of teachers has an immediate effect on the learning process, meaning that if the performance of the teacher is better, the quality of graduates it produces good results. Government regulation number: 19 2005 rcqutfls four coDleteftia3 rrrquiEd of a t achci, Erley: (l) pedagogical (2) p.rsoml competence (3) professional competence (4) social coopcllnca.
Teachers who meet the following competencies, it can be referred to as professional teachers. In connection with the profession of teachers, Act No. 14 of 2005 on teachers and lecturers expressed the principles of professionalism as follows: a. Have the talent (i.e., spirit and idealism calls. b. Is committed to improving the quality of education. c. Have academic qualifications and educational background according to tasks. d. Have the responsibility for the execution of tasks. e. Has the flexibility for the execution of tasks. f. Earned experience. g. Determined in accordance with the performance. h. Have the opportunity to develop in a sustainable career with their professionalism of lifelong learning. i. Having a guarantee of legal protection and professional dignity. j. Coexist with students, teachers, and educators. Bloomingtrott. Phi Dct Kappe Education Foundation. 2. Durkin & Bidder B.J. 2001 Study of teaching.

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