



ISSN : 2548 - 4613
Vol. 4. Desember 2019

Proceedings

The 4th Annual INTERNATIONAL SEMINAR on Transformative Education and Educational Leadership

Theme : Education Innovation in Indonesia Context Focused
on Disruptive Technology of Industrial Revolution 4.0.

23 - 24 September 2019
Garuda Plaza Hotel - Jln. Sisingamangaraja No. 18
Medan, North Sumatra - Indonesia



Supported by :



Committee

Advisors

Dr. Syamsul Gultom, S.KM.,M.Kes (Rector of Unimed)
Prof. Dr. Bornok Sinaga, M.Pd (Director of Postgraduate Program of Unimed)
Prof. Dr. Sahyar, MS.,MM (Vice Director 1 of Postgraduate School of Unimed)
Dr. Darwin, M.Pd (Vice Director 2 of Postgraduate Program of Unimed)

Conference Chairperson	: Dr. Rahmad Husein, M.Ed
Secretary	: Dr. Juniastel Rajagukguk, M.Si
Trasurer	: Dedi Agus Syahputra, SE
Secretariat	: Vivi Emilawati, SE.,M.Si
	1. Erika, S.Pd.,M.Pd
	2. Nurul Fazrika, S.Pd.,M.Pd
	3. Amir Husin Sitompul, S.Pd.I
	4. Agus Harriyanto
Papers and Proceedings	: 1. Dr. R. Mursid, ST.,M.Pd
	2. Dr. Anni Holila Pulungan, M.Pd
	3. Dr. Saronom Silaban, M.Pd
	4. Dr. Tumiur Gultom, M.Si
	5. Mangaratua Simanjorang, M.Pd.,Ph.D
	6. Indra Hartoyo, S.Pd.,M.Hum
	7. Dra. Meisuri, MA
	8. Dr. Hermawan Syahputra, M.Si
Program/Event	: 1. Dr. E. Elvis Napitupulu, M.Si
	2. Dr. Rachmat Mulyana, M.Si
	3. Dr. Elmanani Simamora, M.Si
Plenary Session	: 1. Prof. Amrin Saragih, M.A.,Ph.D
	2. Prof. Dr. Abinus Silalahi, M.S
	3. Prof. Dr. Abdul Hasan Saragih, M.Pd
Moderator for Parallel :	1. Prof. Dr. Edi Syahputra, M.Pd
	2. Prof. Dr. Anita Yus, M.Pd
	3. Prof. Dr. Paningkat Siburian, M.Pd
	4. Dr. Edy Surya, M.Si
	5. Dr. Fauziyah Harahap, M.Si
	6. Dr. Rahmatsyah, M.Si
	7. Dr. Arif Rahman, M.Pd
	8. Dr. Ir. Nurfajriani, M.Si
	9. Dr. Hidayat, M.Si
	10. Dr. Fitrawaty, SP.,M.Si
	11. Dr. Albadi Sinulingga, M.Pd
	12. Dr. Abdurrahman Adisaputera, M.Hum
	13. Dr. Imran Ikhmad, M.Pd
	14. Dr. Arfan Ikhsan, M.Si
	15. Dr. Saidun Hutasuhut, M.Si
	16. Dra. Jubliana Sitompul, M.Hum
Poster Session	: 1. Dr. Anni Holila Pulungan, M.Hum

2. Dr. Syamsidar Tanjung, M.Pd
 3. Dr. Sukarman Purba, M.Pd
 4. Dr. Ajat Sudrajat, M.Si
 5. Dr. Ratih Baiduri, M.Si
 6. Dr. Muhammad Fitri Ramadhana, M.Si
 7. Dr. Mulyono, S.Si.,M.Si
 8. Dr. Daulat Saragi, M.Hum
 9. Dr. Tumiur Gultom, SP.,MP
 10. Dr. Derlina, M.Si
 11. Dr. Wisman Hadi, M.Hum
 12. Dr. Nurhayati Simatupang, M.Kes
 13. Dr. Amir Supriadi, M.Pd
 14. Ali Fikri Hasibuan, SE.,M.Si
 15. Drs. Thamrin, M.Si
 16. Junita Friska, S.Pd.,M.Pd
- Public relations : 1. Muhammad Surip, S.Pd.,M.Si
2. Jihan Siska
- Accommodation : 1. Ater Budiman Sinaga, M.Si
2. Hendry Dalimunthe, MA
3. Yandri Imanuel Siburian, SE., M.Si.
4. Jasmi Assayuti, SHi
- Equipment : 1. Eko Budiarto
2. Sofianto Gultom
3. Suhana Nasution
4. Farid Ma'ruf Harahap
5. Isachar Adry Utomo
6. Diky Arisandi
7. Herianto Samosir, S.Pd
8. Ahmad Rosyadi Nasution, S.Pd
9. Hizrah Saputra Harahap, S.Pd
10. Muhammad Isnaini, M.Pd
11. Nasiruddin, S.Pd
- IT & ICT : 1. Jerry S. Pauned, S.Si
2. Mulyanto Duha
- Transportation : 1. Hisar P. Sianturi, SH
2. Sari Purnamawati Siregar, M.Hum
3. Yutia Hafwenny, S.KM
- Consumption : 1. Fitria Ramadhani
2. Azizi Apri Indaya, S.Pd
3. Susiani, S.Sos
4. Siti Rohana, M.Pd
5. Yutia Hafweny, S.KM
6. Tiarma Nova, M.Pd.
- Receptions : 1. Nisa Ansyari Gultom, S.Pd
2. Desi Yulian, S.Pd
3. Siti Rohana, S.Pd.,M.Pd
4. Cecilia Tampubolon, S.Sos

Rundown of The 4th Annual Internatioanal Seminar on Transformative Education and Educational Leadership (AISTEEL) 2019
Garuda Plaza Hotel, Medan, 23 – 24 September 2019

1st day (Monday, September 23, 2019)

Time	Activities	PIC
15.00 – 20.00	Registration in Garuda Plaza Hotel	committee

2nd day (Tuesday, September 24, 2019)

Time	Activities	PIC/Moderator
07.00 – 08.30	Poster Sessions 1	Section Poster 1
08.30 - 09.00	Opening Ceremony 1. MC Speech 2. Traditional Welcome Dance 3. Indonesian National Anthem 4. Pray 5. Chairperson Report 6. MoU signing between Unimed and PSU - Thailand 7. Welcoming speech of Director of Postgraduate School 8. Welcoming speech and official opening of Rector of State University of Medan	MC
09.00 – 09.40	Plenary Lecture 1: Prof. Dr. Syawal Gultom, M.Pd (State University of Medan– Indonesia)	Moderator Section
09.40 – 10.25	Plenari Lecture 2 Prof. W. L. Quint Oga-Baldwin (Department of Education, Faculty of education and Integrated Art and Sciences, Waseda University - Japan)	Prof. Amrin Saragih, PhD (Panel)
10.30 – 11.15	Plenari Lecture 3 Prof. Dr. Wu-Yuin Hwang (Graduate Institute of Network Learning Technology National Central University, NCU - Taiwan)	
11.15 – 12.00	Plenari Lecture 4 Prof. Dr. Ekkarin Sungtong (Dean of Faculty of Education Prince of Songkla University - Thailand)	Mangara Simanjorang, PhD (Panel)
12.00 – 12.45	Plenari Lecture 5 Asst. Prof. Patcharin Panjaburee, Ph.D. (Mahidol University – Thailand)	
12.45 – 13.30	Lunch Break/ Poster Sessions 2	Section Poster 2
13.30 – 15.30	Parallel Session 1	
15.30 – 16.00	Break/ Poster Sessions 3	Section Poster 3

15.50 – 18.00	Parallel Session 2	Moderator/Operator
18.00 – 19.00	Break/ Prayer	
19.00 – End	Banquet (Gala Dinner) - Announce of Best Presenter - Announce of Best Poster	Consumption Section

Proceedings of the 4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019)

Preface

The 4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019) was held in Garuda Plaza Hotel, Medan City-Indonesia on 23-24 September 2019. This seminar is organized by Postgraduate School, Universitas Negeri Medan and become a routine agenda at Postgraduate program of Unimed now.

The AISTEEL is realized this year with various presenters, lecturers, researchers and students from universities both in and out of Indonesia participating in, the seminar with theme “Education, Learning and Leadership Innovation.”

The plenary speakers coming from various provinces in Indonesia have been present topics covering multi disciplines. They have contributed many inspiring inputs on current trending educational research topics all over the world. The expectation is that all potential lecturers and students have shared their research findings for improving their teaching process and quality, and leadership.

The fourth AISTEEL presents a keynote speaker and 4 distinguished invited speakers from Indonesia, Japan, Taiwan, and Thailand. In addition, presenters come from various Government and Private Universities, Institutions, Academy, and Schools. Some of them are those who have sat and will sit in the oral defence examination.

There are 310 articles submitted to committee, some of which are presented orally in parallel sessions, and others are presented through posters. The articles have been reviewed by double blind reviewer and 172 of them were accepted for published by Atlantis Press indexed by International Indexation and 96 papers are published by digital library indexed by google scholar.

The Committees of AISTEEL invest great efforts in reviewing the papers submitted to the conference and organizing the sessions to enable the participants to gain maximum benefit.

Grateful thanks to all of members of The 4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019) for their outstanding contributions. Thanks also given to publisher for producing this volume.

The Editors

Bornok Sinaga
Rahmad Husein
Juniastel Rajagukguk

Table of Content

Title And Authors	Page
Learning Media Development of Foklore Text Which is Based on Digital in the 10th Grade of Vocational High School PAB 1 Helvetia <i>Yogi Andriyan Zunaeidy</i>	1-3
Translation Shift in the English Version of Musabaqah Tafsir Quran <i>Muhajirah Binti Jamaluddin</i>	4-8
Types of Lexical Creation in Iis Dahlia's Slang Words in Mamaku Hits <i>Filzah Farhana Hasibuan</i>	9-12
The Effect of Learning Strategies and Achievement Motivation on Entrepreneurship Learning Outcomes of Scout Special Unit Education and Culture Program BP-PAUD and DIKMAS Sumatera Utara <i>Johanes Pasaribu</i>	13-16
Analysis of Student's Science Process Skill on Respiration System Topic in Langsa City- Aceh <i>Ajeng Lola Prianti</i>	17-20
Meaning Equivalence in Abdullah Yusuf Ali's Translation of Surah al waqiah from English into Indonesian <i>Wirdatul Mardhiah</i>	21-22
Developing an Authentic Assessment Instrument of Exposition Text Based on Higher Order Thinking Skills (HOTS) in Class X Students of Senior High School <i>Yuli Novita Sari</i>	23-26
Sentence Acquired by Children of 2 – 2.6 Years Old in Bilingual Environment <i>Laura Agustina Simamora</i>	27-29
Development of Study Peripheral Base on the Realistic Approaches to Increase Ability of Mathematical Reasoning of Student Junior High School State 6 Medan <i>Melisa</i>	30-35
Effectiveness of Ecology and Environment Textbook Based on Science Literacy and North Sumatra's Local Potency to Improve High School Student Science Literacy <i>Ivandi Sitompul</i>	36-39
Deposit Determinant Analysis in Bank Sumut <i>Mangaradot Saur A Sinaga</i>	40-47
Development of Teaching Materials Based on Guided Discovery Learning Methods to Increase Mathematical Problem Solving Ability <i>Rianta Ananta Sitepu</i>	48-55
Development of Mathematical Learning Devices Based on Model Problem Based Learning (PBL) to Improve Mathematical Communication Skills of School IT Jabal Noor Students Class VII	56-65

Rizka Putri Rahayu

Development of Thematic Teaching Materials Based on Local Culture at The Fourth Grade of Primary Schools in North Padang Lawas District 66-69

Rahimul Harahap

The Maintenance of Mandailing Language Kecamatan in Torgamba

Putri Nurul Rahmadani Siregar 70-76

Enhancing Students Mathematical Conceptual Understanding by Applying Guided Discovery Learning and Direct Learning Model 77-82

Sri Rahwany Marbun

Development of Learning Devices Based on Realistic Mathematic Education to Improve Mathematical Communication of Students at Senior High School 83-86

Karina Hajar Hutasuhut

The Developing of Interactive Learning Media in Improving The Learning Creativity of 4-6 Year-Old Playgroup Students in PAUD Kenanga Raya Medan 87-89

Romi

The Influence of Learning Approaches and Interest in Learning Against the Results of Learning English in Class VIII Medan SPK Middle School T.A 2018/2019

Juni Triana Sitompul 90-94

Determinant Analysis of Sharia Banking Efficiency in Indonesia

Rahmat Putra Ahmad Hasibuan 95-99

The Development of Interactive Instructional Media Based on Behavioral Perspective to Improve the German Skills of Senior High School Students Grade X 100-102

Hadijah Handayani Sibuea

Development of Guided Inquiry Green Chemistry Practicum Guides 103-106

Ekin Dwi Arif Kurniawan

The Development of Adobe Flash Media Integrated Problem Based Learning on Salt Hydrolysis 107-110

Indriati Aulia

The Effect of Learning Strategy and Interpersonal Communication on the Students Achievement Reading Comprehension English Language at SMP Negeri 1 Selesai Kabupaten Langkat Tahun Ajaran 2018 / 2019 111-115

Husna Lubis

Cognitive Consideration in Persuading Readers in Argumentative Writing 116-119

Betharia br. Sembiring Pandia

The Role of the Single Mother of Parenting in Informal Education in Javanese Ethnic Families in Kualuh Hulu District Labuhanbatu Utara Regency 120-122

Suriyanti Siagian

Understanding of Female Prisoners Character Education Through Formal 123-125

Socialization at Labuhan Ruku Penitentiary

Dian Puspita Sari Sirait

Local Wisdom-Based Education Marsialapari Salak Farmers Sibangkua Angkola Barat Tapanuli Selatan 126-128

Desy Andarini

Rituals at the Tomb of Datuk Darah Putih as a Media for Nonformal Education to Respect Ancestors (Case Study Chinese Ethnic in Aur Village Medan Maimun District Medan City) 129-131

Gadis Anastasia

Interactive Multimedia-Based Learning Materials Innovation for Teaching Basic Techniques in Analysis 132-134

Yuni Chairani

The Effect Model of Learning and Learning Interest Against the Results of Learning the Knowledge of Nature Primary School (SD) in Medan T.A 2019/2020 135-139

Mida Lishanata

Development of Interactive Media in Arabic on the Material Read Class VIII of MTs Darul Hikmah T.A 2019/2020 140-143

Nurul Amri

The Influence of Leadership Behavior, Work Motivation, Job Stress, and Job Satisfaction on Lecturers' Performance 144-146

Hanafiah

Developing Big Book as Reading Materials Based on Thematic Approach for Fourth Grade Students at SD Negeri 028068 Binjai East Binjai Regency Langkat 147-149

Utari

The Development of Textbook Based on Research About the Insect Pollinator on Chili Paper (*Capsicum annum L.*) 150-154

Fitriatul Aspahani

Gratitude Expressions and Responses used by the Characters in the Vow Movie 155-158

Sabrina Octavia Pandingan

Subtitling Strategies Used in The Meg Movie Texts 159-164

Devi Sucina Nirwana

Lexical Metaphor in Novel and Film Critical Eleven 165-167

Indah Christiani Silitonga

The Types of Modality in Teaching Learning Process 168-169

Harnida Tanjung

The Effect of Teaching Strategies and Students Motivation on Reading Comprehension Achievement 170-173

Zulkarnain Batu Bara

The Types of Flouting Maxim by Governor Candidates of North Sumatera in Election Debate 2018	174-176
<i>Tri Wita Indah Sari</i>	
The Effect of Teaching Strategies and Students' Interest on Reading Comprehension of Recount Text of Eighth Grade Students of MTs Qur'an Kisaran	177-179
<i>Ahmad Fauzi</i>	
Flouting Maxims in the Courtroom of Administrative Court	180-182
<i>Aminah Ari Fadhila</i>	
Development of Adobe Flash Learning Media Based on Cooperative Learning to Improve Student's Spatial Ability at Chandra Kumala Secondary School	183-188
<i>Fajar Sukma Harsa</i>	
Improving Results in Learning Bahasa for Poetry Readings with the Implementation of a Direct Learning Model for Fifth Grade Elementary School	189-192
<i>Dr. Mayske Rinny Liando, S.Pd., M.Pd</i>	
Development of Learning Materials Based on Problem Based Learning to Improve Students Problem Solving Ability	193-197
<i>Poppy Amalia</i>	
Analysis Of The Economic Bilateral Relationship Indonesia – China On Balance Of Payments In Indonesia	198-201
<i>Sri Wulandari</i>	
Community Participation in Preservation of City Park The Case of Binjai City, Indonesia	202-204
<i>Widya Afriani Wiliskar</i>	
The Types of Gender Arguments in Instagram (A Case Study of Donald Trump's Political Status)	205-207
<i>Putri Permata Sari Samosir</i>	
The Analysis of Monetary Policy Transmission Mechanism by Exchange Rate Channel in Influencing The Inflation in Indonesia	
<i>Putry Sari Rahmadyah Pulungan</i>	208-214
Translation Technique Applied in Translating the First Call from Heaven Novel	215-222
<i>Sudariyani</i>	
Education Cultural in Bona Pasogit (Ethnographic Study of Education Cultural Inheritance in the Toba Batak Society Marga Panjaitan in Pematangsiantar)	223-225
<i>Tripresar Jhon Tuan Panjaitan</i>	
Evaluation Of Tiered In Order To Increase PAUD Teacher Competence In Medan City	226-230
<i>Rehmenda Christy</i>	
Women Politeness Strategies of Bargaining "Media Credit Store" in Tanjung	231-233

Morawa

Nahdyah Sari Daulay

Toba Batak Language Shift in Rantau Selatan

Helfi Vinawari S

234-236

Development of Interactive Multimedia Digital Storytelling in English Subjects

237-239

Juanda

The Effect of PLAN (Plan, Locate, Add and Note) Strategies on Students' Achievement in Reading Comprehension

240-244

Neneng Nurhamidah

Unggah-Ungguh Code Switching in Kartini Movie

Yutika Sari

245-247

Metaphors in Umpasa of the Toba Batak Wedding Ceremony

248-250

Sactica Oktavyani Sagala

The Effect of Model learning and Gender Against Piano playing Skills for class V SMK Negeri 11 Medan T.A 2019/2020

251-255

Gufran Nurman

The Effect of Cooperative Learning Model Based on Aceh Culture to Improve the Generic Science Skills of Student

256-260

Safitri Raufa

Gender Conversation in Workplace Context

Aisyah Fitriani Dasopang

261-265

Management and Development Quality of Teacher Performance Through Teacher Competence in the First Middle School in Banda Aceh

266-268

Faisal Anwar

Modality used in Beauty Product Advertisements on Instagram Caption

269-272

Indah Eka Sari

Attitudinal Appraisal in Ahok's Speech

Firdha Sabrina

273-276

Appraisal Attitudes by the Judges on Indonesian Idol "Grand Final" Session

Mieta Setieya

277-280

The Development of Virtual Laboratory-Based Learning Media of Biology on The Topic of Bacterial for High School Students

281-284

Lailatussyifa

Analysis of Economic Opening on Rupiah Exchange Rate on United States Dollars (2008-2018)

285-289

Sri Wahyuni

The Manners of Cognitive Process in Translating English Phrasal Verbs Into

290-293

Indonesian

Fitri Ervina Tarigan

Javanese Addressing Terms Maintenance by the Teenager Speakers in Bukit Malintang 294-298

Sudarti Rahayu Ningsih

Appraisal in Students' Argumentative Writing 299-302

Ika Vanesia Siagian

Speech Pauses Used by Male and Female Students in English Oral Examination 303-305

Lamia Deareni

The Development of Guidance and Integrated Science Practicum Kit Integrated Guided Inquiry Model bases Science Process Skills for Class VII Semester I 306-309

Fretty Nafratilova Hutahaeen

Analysis of Biomolecular Practicum Guides According to KKNi Curriculum 310-313

Nurul Indah Pratiwi

The Cognitive Process of Different Gender in Writing Argumentative Text 314-318

Surya Teriadi Tarigan

The Development of Chemistry Lab Guide Book for High School Based on Guided Inquiry to Measure Scientific Attitudes and Science Process Skill 319-325

Gorat Victor Sibuea

The Unnaturalness of the Translatio of Indonesian Tourist Resorts Signs Into English in Parapat and Bukit Lawang 326-328

Iis Aprianti

Grammatical Error of Speech by Students in Bilingual Program of Ma'had Al Jami'ah UIN North Sumatra 329-332

Riyah Shibha Nasution

Speech Functions Used by Male and Female Tour Guides in Their Touring Interaction with Tourists in Bukit Lawang 333-336

Widya Ningsih

Analysis of the Influence of Economic Openness to Indonesia Growth 337-340

Zando Silaban

Design Development and Standard Operational Procedure for Training Model Management of 3 Diploma Mechanical Engineering University of Medan 341-345

Mindo Judica Pangaribuan

The Euphemism in "Sambah Manyambah" Tradition of Minangnese Wedding Ceremony 346-348

Muhammad Fauzi

Analysis of Factors That Influence the Interdiction of District/City in the Province 349-354

North Sumatra

Muhammad Yulhelmy Isra

Development of Interactive Learning Media Based on Adobe Flash CS 6 in Geographic Lessons 355-360

Mardimpu Sihombing

The Comparison between Predict Observe Explain (POE) and Think Pair Share (TPS) Learning Model on Students Learning Achievement, Activity, and Critical Thinking Skill on Human Circulatory System 361-367

Remli Nelmian Simarmata

Metaphor Translation in English and Indonesian Version of Surah Ali Imran 368-371

Uswatun Hasanah

Enhancing Students Mathematical Conceptual Understanding by Applying Guided Discovery Learning and Direct Learning Model

Sri Rahwany Marbun
Post Graduate Mathematics Education
State University of Medan
Medan, Indonesia

Corresponding email: srirahwanymarbun15@gmail.com

E. Elvis Napitupulu
Mathematics Education
State University of Medan
Medan, Indonesia

Mulyono
Mathematics Education
State University of Medan
Medan, Indonesia

Abstract—The purpose of this study is to analyze whether there is an enhancement difference of mathematic conceptual understanding ability (MCUA) of student which is taught by guided discovery learning (GDL) and which is taught by direct learning (DL). This study is quasi experimental study. The population of this study is the eighth grade students of Madrasah Tsanawiyah Negeri Barus. The sample of this study is taken randomly, which consisted of two classes. The experiment class is taught by guided discovery learning (GDL) and the control class is taught by direct learning (DL). The result of study showed that there is enhancement difference of mathematic conceptual understanding ability (MCUA) of student which is taught by guided discovery learning (GDL) and student which is taught by direct learning (DL). The N – gained of mathematical concept understanding ability of student which is taught by guided discovery learning (GDL) is higher than student which is taught by direct learning (DL).

Keywords—*mathematical conceptual understanding, guided discovery model, direct learning model.*

I. INTRODUCTION

In life we never separate from education. All education activity such as education counseling and training is guided to achieve education purpose. In this context, the education purpose is education system component which placed position and central. That is why, every education staff needs to understand well the purpose of education, so that they try to carry out their duties and functions to achieve predetermined educational goals. In education too, we never escape the name of mathematics. Mathematics is the heart of all science. Mathematic is a study material which has abstract object and built by deductive reasoning process, that is the truth of a concept gained as logical cause of previous truth have been

accepted which means concept in mathematic is strong and clear.

Understanding about mathematics concepts is arranged hierarchically, structurally, logically, and mathematically start from the simplest concepts until the most complex concepts so that conceptual understanding is a skill which need to be paid attention. According to [6], students have conceptual understanding skill if students are able to (1) explain concepts or be able to re express what have been communicated to them (2) use concepts in variety different situation and (3) develop some causal of a concept. The same explanation of [2] in the first of mathematic learning purpose that conceptual understanding is students skill in understanding mathematic concepts, explaining the correlation between concept and applying concept or algorithm widely, accurately, efficiently and correctly in problem solving. Therefore can be said that a student has good conceptual understanding if she or he can re explain learnt concept, give example and non example from concept and use concept in problem solving. In other word can be meant that if students understand toward a concept, the students have ability to solve problem correctly.

In fact found that conceptual understanding skill which possessed by students nowadays is still shows there is good conceptual skill yet. The low of mathematic conceptual understanding ability of students is strengthen by result test given to several students to solve question related to conceptual understanding. Based on the answer given there are still many not too understand about the question given to them, the students give various wrong answer, it because the students do not understand the concept well. According to Program for International student assessment (PISA) under OECD (Organization economic Cooperation and Development) held survey in last 2015 and the result about

students mathematic skill released in the beginning December of 2016. Indonesia is in 69th position of 76 countries. While from TIMSS (Trends in International Mathematics and Science Study) shows that students of Indonesia place 36th rank of 49 countries. It shows that the low quality of mathematic understanding skill possessed by students.

The low of mathematic conceptual understanding ability of students is strengthen by result test given to several students to solve question related to conceptual understanding. Based on the answer given there are still many not too understand about the question given to them, the students give various wrong answer, it because the students do not understand the concept well.

According [3], mathematic learning should not served in final arrangement form to make mathematic learning process run well, but the students should involve actively in finding concepts, structures and patterns. Therefore, the teacher needs to design a learning which can involve students actively in learning so the interaction between teacher and students become more effective. One of suggested learning suitable with education development and innovation is discovery learning. Discovery learning is one of way which can be applied by the teacher in mathematic learning, where students involve in building their own knowledge. [1] Bruner (Dahar) states that discovery learning is good for seeking knowledge actively by students and will give best result. This result is strengthen by Indiarti and Suyudi research (2012) express that problem solving skill of student by discovery learning model is better than conventional teaching. Also, [5] Pasaribu, Surya, and Syahputra that mathematic understanding skill of student by discovery learning is better than direct learning.

The using of direct learning which has been used during this time don't close possibility of conceptual understanding ability improvement of student because teachers don't apply direct learning correctly based on direct learning steps. In this research process, the researcher will apply direct learning based on direct learning steps so that predict that it can enhance student conceptual understanding skill

II. THEORETICAL FRAMEWORK

A. Guided Discovery

Discovery method is teaching method which manage learning as well so the students get knowledge by their own way without teacher explanation. Discovery learning needs enough long time if the students do not get guidance from teachers. Therefore teacher needs discovery learning which can guide students in finding concept so that students are not hurry in deciding a conclusion.

Discovery learning is method which more emphasize on direct experience, the learning more prioritize on process than result of study. In this method, it does not mean what students find is really new, because it has been known by others.

Guided discovery learning is a learning method where students are faced to situation or problem through question on students worksheet, students collect supported data to make presumption in order to get right conclusion. Several activities

are done by students to find a concept with teacher aid or guidance through questions which can stimulate mathematic thinking ability of students so that students find concept from learning material.

Mathematic contains several abilities that are expected to be mastered by students. One of that is ability in understanding mathematic concept. Mathematic is knowledge with concept which arranged structurally, logically, and systematically from simple concept until complex concept. Understanding about concept will make students be able differentiate example and non example because concept is an idea which is classified into a term. This meaning is same with Dahar opinion (2011:62) concept is internal presentation of a group stimulus, concept cannot be observed, concept should be concluded from behaviour.

B. Mathematical Conceptual Understanding

According to [7] Klipatrick conceptual understanding is ability in understanding concept, operation and relation in mathematic. Abstract mathematic concept possible us to classify object or incident to be able expressing example and non example from concept. The basic of mathematic knowledge is understanding concept and the regulation in mathematic is procedure. The procedures without basic concept will bring to mistakes or unlike mathematic.

According to [4] Minarni, Napitupulu, and Husein the first series from test simulation is designed based on mathematic understanding aspects namely; 1. Using figure to help solving problem 2. Giving example and non example for a concept 3. Classifying example into each category 4. Proposing mathematic equality 5. Understanding and using pattern to solve problem 6. Applying equality and non equality to solve problem 7. Explaining solution.

III. RESEARCH QUESTION

1. Is there any enhancement difference of student mathematical concept understanding ability taught by guided discovery learning and direct learning?
2. Is N- gained of student mathematical concept understanding ability taught by guided discovery learning higher than student taught by direct learning?

IV. RESEARCH METHOD

This study is categorized into quasi experimental study. The population of this study is the whole of eighth grade student of Barus state MTs and the sample of this study is VIII-A class and VIII-B class as experiment and control class, where VIII-A as experiment class with total student is 30 students and VIII-B as control class with total student is 30 students. The experiment class in this study will be taught by guided discovery learning while control class will be taught by direct learning.

V. DATA ANALYSIS, RESULT AND DISCUSSION

The purpose of this study is to analyze enhancement different of mathematical concept understanding ability of student which taught by guided discovery learning and direct learning. The researcher gains result of mathematical concept understanding ability of student through pre test and post test in experiment class and control class. The result of test gives information about students' ability before and after treatment was given, either in experiment through guided discovery learning or in control class through direct learning.

TABLE 1. NORMALITY TEST OF MCUA

Normality	Model	Kolmogrov – Smirnov ^a		
		Statistic	Df	Sig.
Pre Test	GDL	.101	30	.200 [*]
	DL	.157	30	.058
Post Test	GDL	.123	30	.200 [*]
	DL	.156	30	.062

Based on Table 1, it shows that probability score (sig) of pre test and post test for learning model is higher than 0.05. It means that Ho is accepted or in other word the data of mathematical concept understanding of student are from normal distributed population.

TABLE 2 HOMOGENITY PRE-TEST SCORE MCUA

F	df1	df2	Sig.
.429	1	58	.515

TABLE 3. HOMOGENITY POST-TEST SCORE MCUA

F	df1	df2	Sig.
.001	1	58	.975

Based on Table 2 and 3, it shows that probability score (sig) of pre test and post test is higher than 0.05. It means that the data of mathematical concept understanding of student are from same data group variance or homogen.

TABLE 4. RECAPITULATION OF N-GAIN RESULT OF MCUA

Class	Pre Test	Post Test	N-Gain
	\bar{x}	\bar{x}	\bar{x}
GDL	25,17	59,67	0,47
DL	26,33	44,08	0,23

Based on Table 4 that before learning, mean score of mathematic concept understanding ability of student taught by guided discovery learning is 25.17 while mean score of mathematic concept understanding ability of student taught by direct learning is 26.33. After treatment, there is enhancement of mean score of mathematic concept understanding ability both of group. Mean score of mathematic concept understanding ability of student taught by guided discovery learning is 59.67 (N- gained is 0.47). According to [8] Hake category the enhancement of mathematic concept understanding ability of student taught by guided discovery

learning is categorized into medium category ($0.3 < g < 0.7$). While mean score of mathematic concept understanding ability of student taught by direct learning is 44.08 (N- gained is 0.23). According to [8] Hake category the enhancement of mathematic concept understanding ability of student taught by direct learning is categorized into low category ($g < 0.3$).

TABLE 5. RESULT OF REGRESSION COEFFICIENS FOR CLASS EXPERIMENT I

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	41.070	4.330		9.486	.000
	X	.739	.151	.680	4.901	.000

TABLE 6. RESULT OF REGRESSION COEFFICIENS FOR CLASS EXPERIMENT II

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.287	5.033		4.229	.000
	X	.866	.174	.685	4.976	.000

Based on Table 5 and Table 6 the result of mathematical concept understanding ability of student gained that the regression equality for experiment class is $Y_E = 41,070 + 0,739X_E$ and the regression equality for control class is $Y_K = 21,287 + 0,866X_K$

TABLE 7. INDEPENDENCE TEST OF MCUA FOR CLASS EXPERIMENT I

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3132.574	1	3132.574	24.020	.000 ^a
	Residual	3651.592	28	130.414		
	Total	6784.167	29			

a. Predictors: (Constant), X

b. Dependent Variable: Y

From the calculation on Table 7 for mathematical concept understanding ability gained that F calculate is 24.020. Based on F_{table} , gained that F_{table} is 4.171. It means that $F_{calculate}$ is higher than F_{table} ($24.020 > 4.171$) so that H_0 is rejected and H_a is accepted which means there is positive effect (significant) of beginning mathematic concept understanding ability result test of student (X) towards final result test of student (Y) for experiment class I.

TABLE 8. INDEPENDENCE TEST OF MCUA FOR CLASS EXPERIMENT II

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3229.397	1	3229.397	24.762	.000 ^a
	Residual	3651.645	28	130.416		
	Total	6881.042	29			

- a. Predictors: (Constant), X
- b. Dependent Variable: Y

From the calculation on Table 8 for mathematical concept understanding ability gained that F calculate is 24.76. Based on F_{table} , gained that F_{table} is 4.171. It means that F calculate is higher than F_{table} ($24.762 > 4.171$) so that H_0 is rejected and H_a is accepted which means there is positive effect (significant) of beginning mathematical concept understanding ability result test of student (X) towards final result test of student (Y) for experiment class II.

TABLE 9. RESULT REGRESSION LINEARITY OF MCUA FOR CLASS EXPERIMENT I

			Sum of Squares	Df	Mean Square	F	Sig.
Y * X	Between Groups	(Combined)	4764.896	14	340.350	2.528	.043
		Linearity	3132.574	1	3132.574	23.270	.000
		Deviation from Linearity	1632.322	13	125.563	.933	.546
	Within Groups	2019.271	15	134.618			
Total			6784.167	29			

From the calculation on Table 9 for mathematical concept understanding ability gained that F calculate is 0.933. Based on F_{table} , gained that F_{table} is 2.448. It means that $F_{calculate}$ is lower than F_{table} ($0.933 > 2.488$) so that H_0 is accepted or regression model for experiment class I is linear.

TABLE 10. RESULT REGRESSION LINEARITY OF MCUA FOR CLASS EXPERIMENT II

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Y * X	Between Groups	(Combined)	4037.813	13	310.601	1.748	.144
		Linearity	3229.397	1	3229.397	18.173	.001
		Deviation from Linearity	808.416	12	67.368	.379	.952
	Within Groups	2843.229	16	177.702			
Total			6881.042	29			

From the calculation on Table 10 for mathematical concept understanding ability gained that F calculate is 0.379. Based on F_{table} , gained that F_{table} is 2.599. It means that $F_{calculate}$ is lower than F_{table} ($0.379 > 2.599$) so that H_0 is accepted or regression model for experiment class II is linear.

TABLE 11. ANOVA FOR THE SIMILARITIES OF TWO REGRESSION MODELS

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5885.199	1	5885.199	29.883	.000 ^a
Residual	11422.613	58	196.942		
Total	17307.813	59			

- a. Predictors: (Constant), X
- b. Dependent Variable: Y

From the calculation on Table 11 for mathematical concept understanding ability gained that F calculate is 29.883. Based on F_{table} , gained that F_{table} is 4.007. It means that $F_{calculate}$ is higher than F_{table} ($29.883 > 4.007$) so that H_0 is rejected. It means that both of linear regression model are not same or different significantly.

TABLE 12. REGRESSION MODEL ALIGNMENT

Class	SST _x	SST _y	SPT	SST _x (adj)
Discovery Learning	5736,667	6784,167	4239,167	3651,5925
Direct learning	4309,167	6881,042	3730,417	3651,645
Total	10045,833	13665,208	7969,583	7303,24
A	B	F*	F table	H₀
7303,24	7342,760	0,303	4,001	Accepted

From the calculation on Table 12 for mathematical concept understanding ability gained that F calculate is 0.303. Based on F_{table} , gained that F_{table} is 4.001. It means that $F_{calculate}$ is lower than F_{table} ($0.303 > 4.001$) so that H_0 is accepted. It means that both of linear regression model for experiment class II and experiment I are equal. Both of regression model are not same (uncoincide) and equal can be concluded that there is difference of study result in experiment class and control class.

TABLE 13. RESULT ANCOVA OF MCUA

Dependent Variable: PostTest_GDLDL

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	9965.052 ^a	2	4982.526	38.678	.000
Intercept	11962.090	1	11962.090	92.859	.000
PreTest_GDLDL	6322.448	1	6322.448	49.080	.000
Model	4079.853	1	4079.853	31.671	.000
Error	7342.760	57	128.820		
Total	178768.750	60			
Corrected Total	17307.813	59			

- a. R Squared = ,576 (Adjusted R Squared = ,561)

From the calculation on Table 13 about student mathematical concept understanding ability obtained F calculate is 31,671. According to F table, the F table is 4.001. In this case, F calculate is higher than F table ($31,671 \geq 4.001$) means that H_0 is rejected and H_a is accepted. It can be concluded that there is enhancement difference of student mathematical concept understanding ability in applying guided discovery learning model and direct learning model.

Based on result of study, the mean of normalized gained score of student mathematical concept understanding ability which is taught by guided discovery learning is 0.47 higher than student which is taught by direct learning is 0.23. The gained regression model for concept understanding ability in experiment class I is $Y_E = 41.070 + 0.739 X_E$ and experiment class II $Y_K = 21.287 + 0.866 X_K$, the linear regression line for experimental class I is above the linear regression line for experimental class II. It is caused by both of constant of linear regression line equality for experimental class I, concept understanding ability is 41.070 higher than linear regression line equality constant for experimental class II is 21.87. It indicates that there is significant difference and the height of regression line draw student result of study is $X=0$. So, the regression line for experimental class I $Y= 41.070$ and the regression line for experimental class II $Y=21.287$ which means can be concluded that there is improvement difference of student concept understanding ability in applying guided discovery learning and direct learning.

It is right if there is enhancement of mathematic conceptual understanding skill of student which taught by guided discovery learning is higher than student which taught by direct learning. In guided discovery learning, the students are given LAS which is filled with guide to find an understanding by themselves about material which is learnt by students. The given LAS also filled with family problem and easy to be understood by students because it is real, reachable by their imagination and imaginable so that easier for students to find the meaning of material being learnt by using conceptual understanding skill possessed by students.

In guided discovery learning, students are guided to be able to find and use variety information source also ideas to enhance their skill. In guided discovery learning, students also pass group work process or systematic team so that students are able to empower, sharpen, test and develop thinking ability of student related to conceptual understanding. The existence of this group learning form will build the will and curiosity on students self so that the low mathematical conceptual understanding of student will be higher. The less active student will be active student because learning involves students in group working and the given problem is in daily life form.

Direct learning presents a learning situation which make teachers dominate learning activity. Direct learning make teacher as learning source for students, teacher makes big role in transferring knowledge process to students, teacher explains material being learnt. Otherwise students will hear teacher's

explanation calmly. If there are some material are not understood by students, there will be ask and answer process between teacher and students. After explaining the material, the teacher will give some exercises related to material which have been explained. The activity sequences which is done by students in direct learning will make students be passive in learning. The students only accept everything which is explained by teacher, hear and note the teacher's explanation.

This result is same with [11] research in their research entitled "Discovery learning with the help of Geogebra dynamic geometry software" which shows that guided discovery learning is more effective and better than conventional teaching. [9] Effendi research also shows that student which taught by guided discovery teaching is better than direct learning. Also, [10] Achera, Belecina and Garvida in their research about the effect of discovery learning toward student result in group learning which taught by discovery learning is better than group which taught by direct learning. Students are more interested and motivates to do discovery learning activity.

VI. CONCLUSION

Based on result of analysis, the mathematic learning either through guided discovery learning or through direct learning can be concluded that as follows:

1. There is enhancement different of student mathematical concept understanding ability which is taught by guided discovery learning and student which is taught by direct learning.
2. N-Gained of mathematical concept understanding ability of student which is taught by guided discovery learning is higher than student which is taught by direct learning.

ACKNOWLEDGMENT

This research was supported by my supervisors Dr. E. Elvis Napitupulu, MS and Dr. Mulyono, M.Si.

REFERENCES

- [1] Dahar, R.W. 2011. Teori-teori Belajar dan Pembelajaran. Jakarta: Erlangga.
- [2] Depdiknas. 2006. Standar Isi untuk Satuan Pendidikan Dasar dan Menengah, SK dan KD SMP/MTs. Jakarta: BNSP.
- [3] Hudojo, H. 2005. Pengembangan Kurikulum dan Pembelajaran Matematika. Malang: UM PRESS.
- [4] Minarni, A. Napitupulu, E.E & Husein, R. 2016. Mathematical Understanding and Representation Ability of Public Junior High School in North Sumatra. Journal on Mathematics Education, Volume 7, No. 1, January 2016, pp. 43-56, ISSN 2087-8885.
- [5] Pasaribu, E.Z., Surya, E. & Syahputra, E. 2016. Peningkatan Kemampuan Pemahaman dan Disposisi Matematis Siswa Melalui Model Pembelajaran Penemuan Terbimbing di MTSN 1 Padangsidempuan. Jurnal Paradikma. 9(2): 11-19.
- [6] Duffin, J. M. & Simpson, A. P. 2000. A Search for Understanding. Jurnal of Mathematical Behavior, 18(4): 415-427.

- [7] Kilpatrick, Swafford, dan Findell, (2001). *Adding It Up: Helping Children Learn Mathematics*. National Academy Press.
- [8] Hake, R. (1998). Relationship of Individual Student Normalized Learning Gains in Mechanics with Gender, High-School Physics, and Pretest Scores on Mathematics and Spatial.
- [9] Effendi, L. A. 2012. Pembelajaran Matematika dengan Metode Penemuan Terbimbing untuk Meningkatkan Kemampuan Representasi dan Pemecahan Masalah Matematis Siswa SMP. *LPPM UPI. Jurnal Penelitian Pendidikan*, Vol. 13, No. 2, ISSN 1412-565X.
- [10] Achera, L. J.; Belecina, R.R. & Garvida, M.D. (2015). The Effect of Group Guided Discovery Approach on The performance of Students in Geometry. *International Journal of Multidisciplinary Research and Modern Education (IJMRME)*. 1(2).
- [11] Tran, T. Nguyen, N, G. Bui, M, D. 2014. Discovery Learning with the Help of the Geogebra Dynamic Geometry Software. *International Journal of Learning, Teaching and Educational Research*, Vol. 7, No. 1.

