



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 Ikhamad, 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. Tiarna 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 Nafartilova 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

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

Yuni Chairani

(Departement of Chemistry
Education on Post Graduate
Program, State University of Medan,
Indonesia
nurainibinibrahim@gmail.com

Ajat Sudrajat

(Lecturer in Department of
Chemestry Education on Post
Graduate Program, Stated University
of Medan, Indonesia

Muhammad Yusuf

(Lecturer in Department of
Chemestry Education on Post
Graduate Program, Stated University
of Medan, Indonesia

Abstract: This study aims to determine the basic technical teaching materials in the analysis of basic analytic chemistry course that has fulfilled the BSNP eligibility. This research falls into the realm of research and development with the development model Analysis-Design-Development-Implementation-Evaluation (ADDIE). Samples were selected using a purposive sampling technique. The sample in this study were two student handbooks commonly used in the Faculty of Mathematics and Natural Sciences State University of Medan Basic Analytical Chemistry courses and two classes in the Department of Chemistry Faculty of Mathematics and Natural Sciences State University of Medan as many as 40 students. The research data were then analyzed using SPSS 21.0 for windows through tests of normality, homogeneity, and t test. Through the normality test it was found that the significance of the data > 0.05 , homogeneity testing showed that from the pretest data of the two prices obtained a probability value $> \alpha 0.05$, and the results of hypothesis testing with a value of tcount 7.101 and t table 1.68. The conclusion is that the hypothesis be accepted. The results showed that (1) The feasibility level of innovative multimedia-based interactive chemistry teaching materials for teaching basic engineering materials in the analysis was feasible to use, the average acquisition value of the four aspects was 3.60. (2) There are differences in student learning outcomes using multimedia-based interactive chemistry teaching materials for teaching basic techniques in the analysis that have been developed with student learning outcomes using student handbooks at Faculty of Mathematics and Natural Sciences State University of Medan.

Keyword : *Innovation, Teaching Materials, Learning Outcomes*

I. INTRODUCTION

Good teaching materials are very effective to be used as learning media because they function as a communication tool to bring accurate information from learning resources to learners (Silitonga and Situmorang, 2009). One of the important problems in learning activities is to choose or determine the right teaching materials in order to help students achieve competence. This is due to the fact that there is a lack of quality teaching materials that defer to the development of science and technology. Procurement of quality teaching

materials is one of the efforts to improve the quality of education (Lee, et al, 2010) which will promote quality graduates. Teaching material is very important in the teaching and learning process because it can strengthen and support the teaching material information conveyed by the teacher. Teaching material helps students understand the science concept of achieving the desired competency so that it is easy to remember and can be repeated (Situmorang, 2013). Thus teaching materials as educational media are needed in learning because they can explain various difficult phenomena, including abstract concepts into realistic knowledge (Edginton and Holbrook, 2010). Efforts to innovate learning can be done on learning teaching material is to use learning models and media. One model that can be applied is the project based learning model. Project Based Learning is a learning model that uses projects as the core of learning (Ministry of Education and Culture, 2014).

II. METHODOLOGY

- **Type of Research**
This type of research is research and development using the ADDIE model.
- **Time and Location**
The study was conducted at the Faculty of Mathematics and Natural Sciences State University of Medan. This research was conducted in April 2018 - September 2018. This time interval included: compiling, developing teaching materials, evaluating the feasibility of teaching materials, limited testing of multimedia-based interactive chemical teaching materials.
- **Population and Sample**
The population in research on the development of multimedia-based interactive chemistry teaching materials on basic engineering materials in analysis is the 3rd semester students of Faculty of Mathematics and Natural Sciences who take basic analytical chemistry course at State University of Medan. The sample selection in this study used a purposive sampling

technique. The sample was regular 3rd semester students as an experimental class and extension class as a control class.

• **Research Procedure**

1. Analysis Stage
 - ✓ Analysis of Learning Devices
 - ✓ Needs Analysis
2. Planning (Design) Stage
3. Development Stage
4. Implementation
5. Evaluation Stage

• **Technique of Data Collection**

The data in this study were obtained from: (1) Test sheets for chemical teaching materials (2) Learning Outcomes Test Instruments and (3) Test Questionnaire Instruments.

• **Technique of Data Analysis**

The data in this study consisted of qualitative and quantitative data, so the data analysis was done by processing each data. The qualitative data were analyzed for descriptive percentage. Percentage description analysis is used to describe the percentage of each variable. This analysis is used to determine the percentage level of answer score of each sample.

III. RESULT AND DISCUSSION

• **Analysis of interactive chemical teaching materials**

Post-test Score	Sig	α	T_{count}	t_{table}
Equal variances	0,000	0,05	7,101	1,68

The results of the analysis of interactive chemical teaching materials developed based on the BSNP questionnaire include 1) the appropriateness of contents with the acquisition of an average value of 3.55 which means it is valid and does not need to be revised, 2) Language eligibility obtained an average value of 3.65 means it is valid and does not need to be revised, 3) the feasibility of the presentation obtained an average value of 3.58 means that it is valid and does not need to be revised, 4) the feasibility of the graphics obtained is 3.65 meaning it is valid and does not need to be revised. The conclusion of the acquisition of the average value of the four aspects is 3.60 meaning it is valid and does not need to be revised as appropriate for use. The level of appropriateness of teaching materials developed based on the BSNP includes content eligibility, language feasibility, and presentation eligibility are shown in Fig. 1. Graphical results of interactive chemical teaching materials



Fig. 1. Graphical results of interactive chemical teaching materials

The results of the analysis show that learning activities on the basic technical material in the analysis carried out so far tend to still use conventional approaches through the lecture method so that the learning becomes less meaningful. The analysis of the handbook used by students as reference material in learning basic technical material in the analysis so far shows that the handbook is classified as a category that is suitable for use. Yet, to produce teaching materials that are more creative and innovate, a development is still needed. In this case, teaching materials are developed to produce something different that refers to the learning model in accordance with the qualifications of KKNI-oriented curriculum.

• **Differences in student learning outcomes using interactive chemistry teaching materials**

Based on the data obtained from the results of the study an average of the posttest scores for the experimental and control class shows the posttest results of the experimental class students have an average of 86 with the highest value of 95 and the lowest value of 75. While the control class has an average of 74.75 with a value of the highest 85 and the lowest value is 65. The results of hypothesis testing using the Independent Sample T-Test technique. The criteria that apply in testing data use SPSS 21.0 for Windows. is sig. (2-tailed) $<\alpha$ then H_a is accepted, but if sig. (2-tailed) $>\alpha$ then H_a is rejected. From the test results obtained sig. (2-tailed) $<\alpha$, i.e. (0,000 <0.05), we conclude that the hypothesis. This means that there are differences in learning outcomes of interactive chemistry teaching materials using exe-learning media on basic engineering materials in analysis according to KKNI with student learning outcomes using student handbook.

Based on these results it can be concluded that students who are taught using interactive chemistry teaching materials and using PBL learning models encourage students to be actively involved during the learning process. This shows that the chemical teaching materials developed can support student learning in achieving learning objectives. According to Lukman (2015), with the use of Project Based Learning (PBL) learning along with effective mind mapping media on learning achievement on the subject of colloidal systems.

• **Gain scores of multimedia-based interactive chemical teaching materials**

The results showed that there was a significant interaction of N-gain (level of understanding) of students on basic engineering material in the analysis for the experimental class obtained an average of N-gain of 0.799 with the highest value of 0.917 and the lowest value of 0.688. While for the control class the average N-gain is 0.634 with the highest value of 0.750 and the lowest value of 0.563.

According to Marpaung (2018), the development of innovative chemistry teaching materials as the subject of acid-base titration can improve student learning outcomes. This is

similar to Fajrina (2018) who argues that by using interactive learning media based on computer lecture inspires an increase in learning outcomes.

IV. CONCLUSION

The conclusions in this study can be described as follows:

1. Interactive chemistry teaching material developed in the basic techniques in the analysis have fulfilled BSNP standard criteria with an average rating of 3.60 and is classified as very feasible for students to use and do not need to be revised.
2. There are differences in student learning outcomes that use multimedia-based interactive chemistry teaching materials for teaching basic techniques in the analysis that have been developed with student learning outcomes using student handbooks at the Faculty of Mathematics and Natural Sciences State University of Medan.

ACKNOWLEDGMENT

The writer would like to express respected to Prof. Dr. Ajat Sudrajat, M.Si her experienced supervisor, for showing her how to good speaking and for giving her useful knowledge and who have given suggestions ideas.

REFERENCE

- [1] Silitonga, L.L., dan Situmorang, M., (2009), Eektivitas Media Audio visual Terhadap Peningkatan Prestasi Belajar Siswa Pada Pengajaran Sistem Koloid, *Jurnal Pendidikan Kimia*.
- [2] Lee, A.D., Green, B.N., Johnson, C.D., Nyquist, J., (2010), How to Write a Sholarly Book Review for Publication in a Peer-Reviewed Journal A Review of the Literature, *The Journal of Chiropractic Education*
- [3] Edginton, A., dan Holbrook, J., (2010), A Blended Learning Approach to Teaching Basic Pharmacokinetics and the Significance of Face-to-Face Interaction, *American Journal of Pharmaceutical Education*.
- [4] Situmorang, M., (2013), Pengembangan Buku Ajar Kimia SMA Melalui Inovasi Pembelajaran dan Integrasi Pendidikan Karakter Untuk Meningkatkan Hasil Belajar Siswa, *Prosiding Seminar dan Rapat Tahunan BKS PTN-B Bidang MIPA di Bandar Lampung*, Tgl 10-12 Mei 2013, pp. 237-246.
- [5] Departemen Pendidikan Nasional, (2006), *Pedoman Pengembangan Buku Pelajaran*. Jakarta: Departemen Pendidikan Nasional.
- [6] _____,(2006),*Panduan Pengembangan Pembelajaran IPA Terpadu*. Jakarta: Departemen Pendidikan Nasional. Based Learning with Media eXe Learning in Class X High School Based on 2013 Curriculum, UNIMED, Medan
- [7] Nurfajriani, (2016), Pengembangan Modul Pembelajaran IPA Berbasis Learning Cycle 5E Pada Materi Zat Aditif dalam Makanan. *JURNAL PENDIDIKAN KIMIA*
- [8] Nurfajriani, (2017), Pengembangan Modul Kimia Larutan Yang Inovatif Terinternalisasi Karakter Untuk Meningkatkan Hasil Belajar dan Karakter Siswa, *TABULARASA*

