ICICS 2015

THE 4th INTERNATIONAL CONFERENCE OF THE INDONESIAN CHEMICAL SOCIETY

29 - 30 SEPTEMBER 2015

MEDAN - INDONESIA

THEME : ENHANCEMENT INNOVATIVE CHEMISTRY RESEARCH

PROGRAME AND ABSTRACT

Pemerintah Propinsi

Himpunan

CHAIRMAN

Dear Colleagues,
Welcome aboard!

The ICICS 2015 has been organized to provide a platform for the academicians and researchers to assemble and share the recent knowledge as well as to discuss the initiations required for the growing field of Analytical Sciences. Response to this conference is overwhelming. The conference will have total of 163 papers comprising two plenary, 4 keynotes, 96 orals and 61 posters.

Many thanks to Rector Universiti Sumatera Utara, Rector Univeristi Negeri Medan and Himpunan Kimia Indonesia (HKI) for organized this wonderful event. On behalf of the organizing committee, I thank our Patron, Gabernor Sumatera Utara. I am also thankful to co-chairs of this conference, Dr. Muhammad A. Martoprawiro from Himpunan Kimia Indonesia, and other colleagues for their invaluable support. Also, many thanks for them who supported financially by giving advertisements in the conference digest.

My team, the organizing committee of the ICICS 2015, has been working relentlessly from the conference call to the registration desk to make the ICICS 2015 a memorable event. They were passionate and those services are beyond comparison. I acknowledge them with my sense of gratitude and love. I wish you a fruitful stay at ICICS 2015! Once again, I thank you, on the behalf of the organizing committee for your participation and support.

Best Regards,
Organizing Committee

Prof.Dr.Harry Agusnar
Chairman

RECTOR OF SUMATERA UTARA UNIVERSITY

Warahmatullahi Wabarakatuh.
Good Morning Ladies and Gentlemen.

First of all I would like to welcome to our Distinguished Guests and Keynote Speakers, as well as Presenters and Participants of The 4th International Conference of Indonesia Chemical Society (ICICS) 2015 which is jointly organized by : Departemen of Chemistry FMIPA with UNIMED and The Indonesian Chemical Society North Sumatera,held in Tiara Convention Centre, Medan, Indonesia. On behalf of The Organizing Committee and Civitas Academica of The University of Sumatera Utara, I would like to welcome you all to Medan and North Sumatera Province. Especially to our guests and Speakers coming from Japan, Taiwan, USA, Thailand and Malaysia and other Countries and Provinces in Indonesia, we do hope that you enjoy your stay duringthe Scientific Session in The ICICS.

We are honoured to have you all here and would like to thank you to your interest and participation in the ICICS to discuss our main issue we are facing today, especially in North Sumatera Province, regarding "EnhancementInovation Research".

This issue is directly related into the development of our economy and enterprises which have been subseptible to global crisis, due to their commodity-oriented products. Various agricultural and plantation products. Various agricultural and plantation products, especially in Sumatera Island and Indonesia in general, such as : palm oil, natural rubber, wood, biomass, and other natural resources have not been processed to end products and only been exported as commodities. Whereas several synthetic consumer products, including : food, medicines, as well as polymeric and other engineering materials have to be imported to fulfill domestic demands. Processing of the renewable natural resources requires chemistry as well as polymer material epertise to increase value-added of the products, which inturn decreasing subseptibility of our economy againts the global crisis.

In this occassion we would like to thank to Keynote Speakers and Lecturers : Honorable The Governor of North Sumatera for your invaluable contributions and recommendations in this seminar. We also thank to all presenters and participants dor your interest and discussions.

Finally, I would like to congratulate The Organisers of The Indonesian Chemical Society (ICS) will gather all professionals and practitioners in the field of chemistry to contribute to the developments of North Sumatera Province and other countries in general.

Wassalamualaikum Warahmatullahi Wabarakatuh.

Medan, 29 September 2015

Prof. Runtut Pebriadi, Ph. D
Rector The University of Sumatera Utara

ICICS 2015
PROGRAMME SEMINAR
29 – 30 September 2015

MONDAY, 28th September 2015

[illegible]	**Pre-registration** *Lobby, Hotel Tiara, Medan, Indonesia*

TUESDAY, 29th September 2015

[illegible]	**REGISTRATION** *Ground floor, Tiara Convention Centre (TCC), Medan, Indonesia*
[illegible]	**OPENING CEREMONY** ***I st floor,Balai Raya, TCC)***
[illegible]	**COFFE BREAK** ***(I st floor,Balai Raya, TCC)***

10:00 – 12:00 SEMINAR PLENARY

Room : **Balai Raya, PCC**
Moderator : **Prof. Dr. Harlem Marpaung**

[illegible]	KP-1	Prof. Dr. Tomatshu Takahashi (*Catalysis Research Center, Hokkaido University* Okayama- Japan)	Three Decades of Optical Chemical Sensors Research: Malaysia Experience & The Way Forwards
[illegible]	KP-3	Prof. Dr. Taifo Mahmud (Department of Pharmaceutical Sciences, Oregon State University, USA)	Research at the Interface of Chemistry, Biology, and Medicine: A Collaborative Journey
[illegible]	KP-4	Prof. Dr. Zuriati Zakaria (Universiti Teknologi Malaysia)	Assessment of Toxic Elements in Surface Sediment from Linggi River, Malaysia
[illegible]	KP-2	Prof. Dr. Duen Ren-Hou (Taiwan)	

12:00 – 13:00 Lunch (Balai Raya), Sholat and Rest

13:10 – 15:30 The First Session

Sesion 1 : Material Chemistry, Catalysis, and Processes (A)

Room : Balai Raifa

Hari/Tgl : Selasa/29 September 2015

[illegible]	1A-1	*Rudy Tahan Mangapul Situmeang, Raden Supryanto, Lolita Albert Kahar, Liza Apriliya Sukartiningsih*	Characteristics of $LaCrO_3$ Nano Particles prepared using Pectin as emulsifying agent *Rudy Tahan Mangapul Situmeang, Raden*
[illegible]	IA-2	*Yulia Eka Putri, Diana Vanda Wellia, Alviionita Alvionita*	Morphology-controlled synthesis of SrTiO3 nanocube via solvothermal method
[illegible]	IA-3	*Safni S Safni, Diana Vanda Wellia, Puti Sri Komala, Reza Putri Audina*	Degradation of Textile Dye (Yellow-Gcn) by Photolysis with UV Light and Solar Irradiation Using C-N-Codoped TiO_2 Catalyst
[illegible]	IA-4	*Sri-Wardhani*	Hydrogen Peroxides for Improved Dyes Photodegradation Hydrogen Peroxides for Improved Dyes Photodegradation.
[illegible]	1A-5	*Atiek Rostika Noviyanti, Dani Gustaman Syarif, Riansyah Amynurdin Riansyah Amynurdin*	The Effect Of NaOH and KOH on Preparation of Apatite Lanthanum Silicate using Hydrothermal Method.
[illegible]	1A-6	*li Andri, Evy E Ernawati, Iwan Hastiawan, Muhammad Prasha Silitonga*	Synthesis and Characterization of Nanocomposite Sulfonated PVDF Membrane.
[illegible]	1A-7	*Evy Ernawati, Solihudin Solihudin, Rubianto A A Lubis, Juliandri Juliandri, Diana Rakhmawaty E, Atiek Rostika Noviyanti, Roekmiati Tjokronegoro*	Cellulose Isolation from Rice Husk using Alkaline Peroxide
[illegible]	**COFFE BREAK**		
[illegible]	1A-8	*Diana Rakhmawaty Eddy, muhammad rofik usman, atiek rostika noviyanti Diana Rakhmawaty Eddy, muhammad rofik usman, atiek rostika noviyanti*	The Role of Base Solvent Variant to Structure And Crystal Size Titanium Dioxide (TiO2) by Hydrothermal Method

	IC-11	*Zul Alfian, Harlem Marpaung, Muhammad Taufik*	Analysis Of Methamphetamine In Users Hair By Gas Chromatography-Mass Spectroscopy (Gc-Ms)
	ID-1	*Jaslin Ikhsan, Siti Sulastri, Erfan Priyambodo*	Adsorption Isotherm of Phosphate Ions onto Silica and Amino-Modified Silica from Lapindo Mud
	ID-2	*Rikson Asman Siburian*	Sintesis Grafena Dan Kinerja Grafena Sebagai Material Pendukung Energi Terbarukan
	ID-3	Suherman, dan Sitti Rahmawati	Pemulihan dan Peningkatan Produksi Buah Kakao

: Essential Oils, Drugs and Narcotic (E)
: Agricultural Chemistry and Food Chemistry (F)
: Theoretical and Computational Chemistry (G)
: Balai Duta
: Selasa/29 September 2015

	1E-1	*Adil Ginting*	Constituents of leaf essential oil of Pluchea indica (L.) Less. from Indonesia
	IE-2	*Noor Fitri*	Patchouli essential Oil Extraction using light fermentation - Water Bubble distillation
	1E-3	*Edi Priyo Utomo*	Dehydration of patchouli alcohol and PCA approach to determine product isomers.
	1E-4	*Heri Septya Kusuma, Mahfud Mahfud*	Response Surface Methodology for Optimization Studies of Microwave-assisted Extraction of Sandalwood Oil.
	1E-5	*Warsito warsito, Edi Priyo Utomo, Siti Mariah Ulfa*	Effect of hydration and oxidation reactions of the chemical composition of Kaffir lime oil.
	1F-1	*Titania Tjandrawati Nugroho, Hilwan Yuda Teruna, Riryn Novianti, Dinda Yulia Octaviani, Nikmatul Maul*	HPLC Evidence of possible transglycosylation by Cellulose assisted extraction of plant polar compounds in in 40% Ethanol.
	1F-2	*Adam Wiryawan*	The Role of Chemical Sciences to 1F-3The Critical point in the halal Certi1F-4fication of foods product, Beverage, Medicine and Cosmetics
	F-3	*Eliza Bachtiar, Herlina Herlina, Ines Sugiri Sugiri.*	Preparation and Characterization Edible Film from Dioscorea Starch Incorporated with Liquid Smoke and It's Antibacterial and Antioxidant Properties.
	COFFE BREAK		

WENESDAY 30th September 2015

08:00 – 10:00 Plennary Session

Session : **Plennary**
Room : **Balai Raya**
Moderator : **Prof. Dr. Ramlan Silaban**
Hari/Tgl : **Rabu/30 September 2015**

[illegible]	IS-1	Prof. Duangjai Nacapricha (Faculty of Science, Mahidol University, Thailand)	Some Innovation Products from Analytical Chemistry Research
[illegible]	IS-2	Prof. Bohari Mohd Yamin (Universiti Kebangsaan Malaysia)	Complexation of Protonated Curtis Salts with Nickel and Chromium
[illegible]	IS-3	Prof. Basuki Wirjosentono (University of Sumatera Utara)	Modification of Cyclic Natural Rubber (CNR: *Resiprene-35*) using Maleic Anhydride and Synthesis of Its Low Molecular Weight

10:00 – 10:30 Coffee Break (Lobby Balai Raya)

10:30 – 12:30 The Third Session

Session 2 : **Material Chemistry, Catalysis, and Processes (A)**
: **Biomaterial (I)**
Room : **Balai Raya**
Hari/Tgl : **Rabu / 30 September 2015**

[illegible]	2A-16	*Mita Rilyanti, Yuli Ambarwati, Muhammad Yusuf*	Preparation of Zeolites without Impurities using Bagasse Ash as The Aluminosilicate Source Materials
[illegible]	2A-17	*Diana Vanda Wellia, Rommy Dwipa, Rahmi Saridewi, Safni*	Green Preparation of C-N-Codoped TiO_2 Powder and Its Application for Fabric Industry's Dye Degradation
[illegible]	2A-18	*Swatika Juhana, Agus Taufiq, Chèppy Asnadi*	Synthesis of Silica Gel Based Corncob of Gunung Kidul and Characterization and Test The Water Absorption Capability.
[illegible]	2A-19	*Rikson Asman Siburian.*	Effect of N-Doped Graphene for Properties Of Pt/N-Doped Graphene Catalyst

		Gandasasmita, Muhammad Bachri Amran	alginate ... glutaraldehyde ... puter
	IL-1	*Seri Maulina, Iloan Pandang H Manalu, Yos Pawer Ambarita*	Comparison Utilizat... with Frond to Produce Ox... using Alkali Fusion M...lm Oxidation Method ...by ...d ... Of ...e
	IL-2	*Tri Sutanti Budikania, Candra Irawan, Kartini Afriani, Nelson Saksono.*	Degradation of Linear Alkylb... Sulfonate (LAS) by Using Co... Glow Discharge Electrolys... (CGDE) with NaOh Electrolyte Solution
	IL-3	*Indra – Mawardi*	Effect of Injection Temperature on Defect Plastic Products
	IL-4	*Dwi Rasy Mujiyanti[1*], Utami Irawati[1], Nur Mauliddiyah Akhir*	Study Of Silica Gel And Merkapto-Silica Hybrid Desorption for Co(II) Ion

... : **Chemical Education (M)**
... : **Balai Citra I**
... : **Rabu / 30 September 2015**

	2M-1	*Ramlan silaban*	Preparing An Innovative Chemistry Teaching Module Of Electrolyte And Non Electrolyte Solution Material Integrated Character Education
	2M-2	*Jaslin Ikhsan, Septi Riyanningsih, Sulistiowati Sufiardi*	Analytical Chemistry at SMK – SMAK Bogor through Scientific Approach and Assisted by ICT-based Media
	2M-3	*Agus Abhi Purwoko*	Pengaruh Pendekatan Brain Based Learning Terhadap Hasil Belajar Kimia Di Sma
	2M-4	*Bajoka Nainggolan, Ruth Dharmayana Sinaga*	Applying Of Model Of Quantum Teaching Learning With Media Map Conception To Increase Result Of Learning And Character Cooperation Student At Fundamental Discussion Atomic Structure In Sma
	2M-5	*Ratu Evina Dibyantini*	Comparison Of Students' Learning Outcomes Which Taught By Using Problem – Based Learning Model And Cooperative Type Of Think – Pair – Share By Using Macromedia *Flash*

ICICS 2015

CERTIFICATE OF ATTENDANCE

This is to certify that

JASLIN IKHSAN

as

PRESENTER

at

The 4th International Conference Indonesian Chemical Society
29 - 30 September 2015
Medan, Indonesia

Indonesian Chemical Society	**Organizing Committee**
President	**Chairman**
Muhammad A. Martoprawiro	**Prof. Dr. Harry Agusnar, M.Sc**

Himpunan Kimia Indonesia

THE IMPROVEMENT OF STUDENTS' ACHIEVEMENT ON VOLUMETRIC ANALYTICAL CHEMISTRY AT SMK – SMAK BOGOR THROUGH SCIENTIFIC APPROACH AND ASSISTED BY ICT-BASED MEDIA

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Abstract

This classroom action research (CAR) aimed to improve the academic achievement of students at vocational secondary school of SMK-SMAK Bogor whose Minimum Attainment Criteria (MAC) on the subject of Volumetric Analytical Chemistry were under the standard required by 2013 curriculum. The research followed the CAR of Kemmis and McTaggart model with three cycles. Learning was conducted by scientific approach and assisted by information technology (ICT)-based media. The ICT-based media were power point, Learning Management System (LMS), and/or project video as relevant characteristics of subject matter and reflection finding. The samples were 28 students at the class of grade 11-1. The improvement of students' achievement was measured by instrument of test that was construct-validated and carried out at the end of each cycle. The improvement of students' achievement significantly occurred. In Cycle I, mean score of the achievement was 68 with 35.71% students reached MAC, increased to be 89 with 96.43% students above MAC. In cycles II, the mean score was 74 with 53.57% students gained MAC became 91 with 100% students attained MAC. In cycle III, it was 89 with 100% students above MAC to be 97 with 100% students above MAC. The gain score of students'achievement was 0.88, which is categorized as high improvement. Therefore, it can be concluded that the scientific approach of learning and the assistance of media can increase the achievement of students in 11th grade of SMK-SMAK Bogor in Academic Year 2014/2015.

Keyword: Chemistry learning; students' achievement; scientific approach

Introduction

Vocational high school is one of the schools educatingstudents to have high skills and to be ready for work in Indonesia. The school teaches mainly one field of expertise. Bogor High School of Chemistry Analyst (SMK-SMAK Bogor) also runs one field of specific expertise in chemistry analysis. The goal of this school is to produce a highly skilled chemistry analyst that is needed in many chemical industries. Hence, the student's skill on mastering chemical analysis has to be beyond the limits. Besides, the student's skill on processing science also have to be practiced consistently as it can generate chemical analyst that masters three main aspects of learning, which are cognitive, psychomotor, and affective.

The 2013 curriculum instructs every school in Indonesia to improve students'skills on science process in learning activities. The learning process can be carried outby applying scientific approach during Chemistry learning process, from which a school measuresall three aspects of competencies in Chemistry learning, i.e.knowledge, skill, and behavior aspect. Learning the subject of VolumetricAnalytical Chemistry in SMK-SMAK Bogor was conducted as the 2013 Curriculum. The Indonesian Ministry of Education and Cultureadvices that the scientific approach includes fivecomponents of learning. Those components are observing, asking, reasoning, trying/discovering, and serving/communicating. By use the approaches,students' skills on science processes are expected to increase significantly. Scientific skill itself requires students to be active and creative on the process of achieving learning outcome (Semiawan, 2002), and thereforeleaninglasts expectedly by student-centered.

Nowadays, students can be categorized as digital natives. Digital native is person that cannot be separated from digital activities (Prensky, 2001). They spend most of their time to be or using digital devices, such as computer, video games, digital music player, hand phone, camera digital, and others. That

phenomenon affects teacher's creativity to facilitate and accommodate student's need. Hence, the learning that is facilitated by teacher can use instructional media that is closely related to digital world. It can engage active participation of students to trigger the student to be independent learner and to be happy on joining Chemistry learning.

Based on that analysis, authors argued that learning Volumetric Analytical Chemistry should be done by scientific approach and be supported by innovative instructional media. The instructional media have to utilize information technologyenabling students to have better understanding. Therefore, the students' achievementshould improve. In line with the expected output, the goal of this research was to increase students' achievement due to learning by scientific approach, andbecause of learning assistanceusing ICT- based media. The outcome of learning appeared as improvement of student's behavior that can be observed and measured in the form of the changes of attitude, skill and knowledge. The changes were from knowing nothing to knowing many things, from impolite to polite, et cetera (Oemar Hamalik, 2001:154).whilst, according to Indonesian Ministry of Education and culture (2013), scientific approach on learning involved the skills of science process such as to observe, to classify, to measure, to predict, to explain and to conclude. Theimplementation of all steps of scientific processneedsteacher supports. However, the supportsshould belessfor the students with higher level of education. On this research, the skill of scientific process that was observed and measured from the students consisted of 8 aspects, i.e. the ability to observe, to ask, to count, to communicate/to answer questions, to associate, to respond, to design the experiment, and to conclude.

Learning is related closely to direct experiences from which learners can get knowledge. Learning can also be gained from daily facts and phenomenon, to which learners faced in socio-culture communities, can also be from imitation and adaptation, as well as from verbal expression. Except the observation in real environment and in providing a model in the chemistry laboratory, those daily facts and phenomenon can be expressed through relevant digital media. The selection of media becomes crucial as the facilities and condition of learners.Therefore, Dale's cone of experiences is usually used as a reference on the use of media in learning process (Azhar Arsyad, 1997:10).

This research was Classroom Action Research with the model of Kemmis & Mc Taggart (1990:14).The model suggested learning cycles with each cycle consisted of four components as the solution implemented by teachers to decrease learning problems in the class. The four components are: planning, acting, observing and reflecting. The four components that form the chains are seen as one cycle.

Research Methods

The subject of the research was students on XI class in SMK-SMAK Bogor. While the object of the research was the improvement of students' achievement on subject matter of Volumetric Analytical Chemistry through scientific approach and assisted by ICT-based media.Theresearch chose Kemmis & Mc Taggart modeldue to the easiness of model implementation. The activities in each cycle of the model were depicted in the Figure 1.

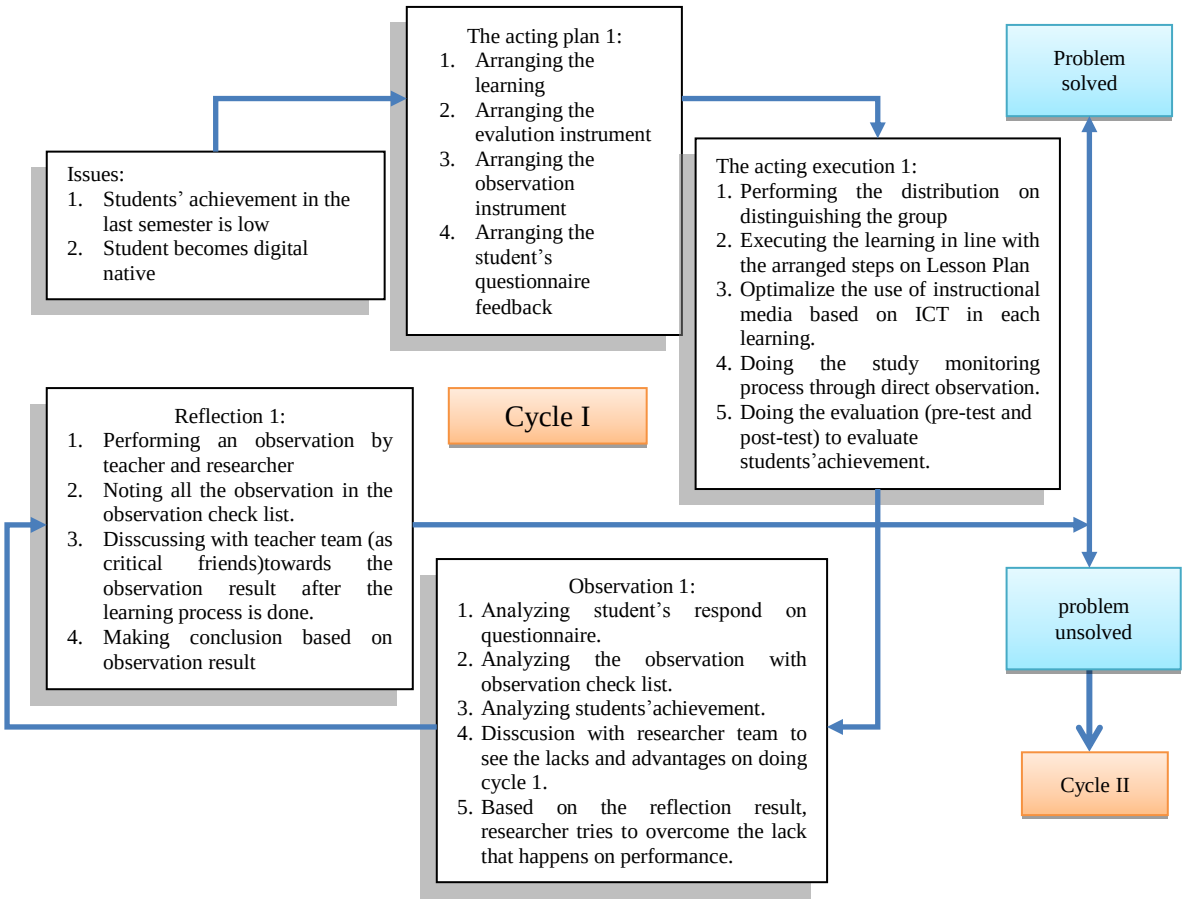

Figure 1. Procedures of research based on Kemmis and Mc Taggart's Model

The instruments that were used in this research were pre-test and post-test, observation checklist, and questionnaire. The data were quantitativeas the results of pre-test, post-test, and qualitative data of questionnaire responses. Thedata analysis to answer the question of the research was described briefly below.

a. Students'Achievement

Students' achievement wasindicated by the average score and percentage of students who pass the Minimum Attainment Criteria (MAC).

- The average score of students was calculated using formula.

$$\boldsymbol{Average\ Score} = \frac{\sum Total\ students'score}{\sum Total\ students}$$

- The percentage of master students having score above the MAC.

$$\%\boldsymbol{Master\ students} = \frac{\sum students\ above\ the\ MAC}{\sum Total\ students}\ x\ 100\%$$

The indicator of successin learning on Volumetric Analysis Chemistry was shown by high percentage of students reaching the MAC, where %master students ≥85%.

b. Students' achievement improvement

The improvement of students' achievement was represented by the difference of scores between posttest and pretest. To analyze the improvement, normalized gain technique was applied. The calculation of

gainNormalized gain was completed by comparison between actual gain score with maximum gain score, using the formulation as follows [Hake(Rochiati,2005:92)].

$$< G >= \frac{T_f - T_i}{SI - T_i}$$

Description :
<G> = normalized gain
T_f= posttest score
T_i = pretest score
SI = ideal score (100)

After the normalized gain score was calculated and obtained, then the criteria of students' achievement improvement was categorized based on the criteria given in Table 1.

Table 1. Normalized Gain Criteria

Normalized Gain Score <G>	**Normalized Gain Criteria**
0.7<N-Gain	High
0.3 ≤ N-Gain ≤ 0.7	Medium
N-Gain < 0.3	Low

c. Response of students on the use of ICT-based media

The use of ICT-based media on learning chemistry may not apply commonly in all schools in Indonesia. The response of students toward the media was measured and analyzed using as follows.

$$\%\boldsymbol{students' response} = \frac{\sum students\ agree}{\sum total\ students}\ x\ 100\%$$

Result and Discussion

This research's was carried out to improve students' achievement in SMK-SMAK Bogor on VolumetricChemical Analysis subject through the scientific approach and ICT based media. The research was done in three cycles with three different subject matters, and three different types of learning media. The first cycle discussed the Iodometry and Iodimetry, andused learning media of Power Point presentation that was prepared and presented by the students based on the experimental data they collected in the laboratory. The second cycle was about Argentometry. Learning was delivered by using e-learning with Learning Management Systemof Moodle platform administrated officially by the school and competed by power point that waspresented by the teacher. Third cycle was on the Water Analysis Application using the media of video projectthat was developed by students in a group. The time allocation in the first cycle was 3 x 2 lesson hours, the second cycle was 2 x 2 lesson hours, and the third cycle is 2 x 2 lesson hours.

1. Students' Achievement

Achievement that has been met by students for three cycles were given on the Table 2,

Table 2. The Data learning result on Pretest and Postest Cycle I,II, and III

Result	Cycle 1	Cycle 2	Cycle 3
Pre-test average score	68	74	89
Post-test average score	89	91	97
%Master students of pre-test	35.71%	53.57%	100%
%Master students ofpost-test	96.43%	100%	100%
Gain	0.88		
Category of improvement	High		

The improvementstudents' achievement can be seen from pre-test and post-test score. Pre-test and post-test are performed using written text instrument that has been validated by the expert of Chemistry content. Based on the data obtained from the cycles of I,II and III, the improvementwas significant. It was categorized as high improvement,both pre-test and post-testincreased insignificant increment. Thisresearch

was conducted to meet 85% master students, which was 85% of students achieve the score of 75. That was obtained in the second cycle. However, the action research was still continued in the next cycle, the third cycles. The purpose of the action was to confirm the reliability of achievement that shown by students in the second cycle. Moreover, the action in the third cycle confirmed that all students met the MAC. The actions in all cycles included the use of learning media and the choice of effective learning approaches.

This research proven that combination of ICT-based media in the three cycles can help student to achieve the MAC. This was in line the report of Arif and Jaslin (2015) that multimodal ICT-based learning that used various ICT-based media on hybrid learning can affect significantly students' achievement. They used the multimedia of android mobile application, flash media animation, PowerPoint presentation, and Prezi online presentation that were developed bythem.Zulkifli et al(2013) also found that ICT-based learning model at Senior high school at Kendari, Indonesia was effective.

The success of students on achieving the MAC was not only due to the application of the media, but also the use of learning approach, which was scientific approach. The approach suggests students be active, and learning should be student-centered. According to Ministry Education and culture (2013), scientific approach can be effective and increase high students' achievement. Scientific approach accustomed student to think smart, to shape the skill of students, to solve the problem, to help students to communicate the ideas, and to create a convenientcondition forlearning.According to Mohammad H. Asoodeh et al (2012) cooperative approach with student centered learning was successful and effectual as a technique toward teaching pupils in school. Cooperative learning through performance of pupils, provide the opportunity for social acceptance and self-confidence and also improve mental ability.

The preference of students on the use ICT was measured by a questionnaire instrument. in each cycle, students were asked to respond the questionnaire to get feedback on the suitability and the effectuality of the media use for the scientific learning. Based the data given the Table 3, it can be concluded that students gave positive response on the choice of learning media in cycle 1 and 3. They preferred to use power point that they developed by themselves to the use of learning management system on e-learning. Moreover, developing a video on project-based learning gave more challenges to students that can motivate them on studies. The effectuality of media on learning can facilitate direct experience to students. Linier to the Dale's cone of experienceAzhar Arsyad(1997:10), learning media would give effective changes ofperformance to students if the media provided direct experience to students to which they can observe, watch, listen, smell, and feel.

Table 3. The Conformity of Learning Media Based on IT

Cycle	Instructional Media	Respond (%)
1.	Student's presentation using Power Point	50
2.	Learning Management System (e-learning) colaborates with Power Point	32.1
3.	Video Project	75

Based on the table, 75% students agreed with the application of instructional media based on IT on Volumetric Chemical Analysis subject. The result of questionnarie also proved that alternative hypothesis about instructional media based on IT can improve students'achievement can be accepted. According to Septi and Jaslin(2013:320), students prefers to participate on learning when it involved digital instructional media, such as mobile games.

According Rick (2009:86), The majority of studies that cited in research, theories, and literature reviews found that there were small-to-moderate gains in overall student achievement when they used computer technologies, including mediain classroom. Clearly, the impact of media, specifically the Power Video Digital product, upon the academic achievement had an extremely great relationship. By involving multiple variablessuch as teacher knowledge and skills and approach that applied, media may be more suitable for some content areas than others in affecting student achievement.

Conclusion

Based on the analysis of the result and the discussion, it can be concluded that by scientific approach and instructional media based on technology, the average students' achievement increases. The increasing the number of students who can meet Minimum Attainment Criteria (MAC) was very significant from 35.71% at initial condition of learning become 100% at the end of learning activities after the Actions.It was also shown from the gain index score of 0.88 meaning the improvement of students' achievement was categorized as high in the criteria.

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