

2017,_ICOMSE_06.pdf

by

Submission date: 06-Aug-2020 09:53PM (UTC+0800)

Submission ID: 1366570401

File name: 2017,_ICOMSE_06.pdf (15.21M)

Word count: 5373

Character count: 34606

ISBN 978-602-470-051-5

PROCEEDING



ICOMSE 2017



International Conference on Mathematics, Science, and Education

Innovation of Mathematics, Science, and Education Research for Sustainable Development



Penerbit & Percetakan

5

Proceeding ICoMSE 2017

International Conference on Mathematics, Science, and Education

Innovation of Mathematics, Science, and Education Research for Sustainable Development

7

⁵
PROCEEDING ICoMSE 2017
INTERNATIONAL CONFERENCE
ON MATHEMATICS, SCIENCE, AND EDUCATION
⁸
Innovation of Mathematics, Science, and
Education Research for Sustainable Development

August, 29-30 2017
Graha Cakrawala, State University of Malang



Universitas Negeri Malang
Anggota IKAPI No. 059 / JTI / 89
Jl. Semarang 5 (Jl. Gombong 1) Malang, Kode Pos 65145
Telp. (0341) 562391, 551312 psw 453



Amin, M... [et al.]

Proceeding ICoMSE 2017 International Conference on Mathematics, Science, and Education; Innovation of Mathematics, Science, and Education Research for Sustainable Development – By: Prof. M Amin... [et al.] (Editors) – First Printing – Malang: State University of Malang Publisher, 2018.

180, xiv pages, 29,7 cm

ISBN: 978-602-470-051-5

5
PROCEEDING ICoMSE 2017

**INTERNATIONAL CONFERENCE ON MATHEMATICS, SCIENCE, AND EDUCATION
INNOVATION OF MATHEMATICS, SCIENCE, AND EDUCATION RESEARCH FOR SUSTAINABLE
DEVELOPMENT**

EDITOR

Biologi

Prof. M Amin
Prof. Aloysius Duran C
Prof. Siti Zubaidah
Prof. Utami Sri Hastuti
Prof. Suhadi
Dr. Umie Lestari
Dr. Abdul Gofur
Prof. Mimien Henie Irawati

Fisika

Prof. Dr. Arif Hidayat, M.Si
Dr. Markus Diantoro, M.Si
Nandang Mufti, Ph.D
Dr. Taufik

Kimia

Prof. Dr. Efendi
Dr. Suharti
Dr. Suryani Wonoraharjo
Prof. Dr. Subandi, M.Si
Anugerah Ricky Wijaya, D.Sc.

Matematika

Prof. Purwanto, Ph.D

Prof. Dr. Toto Nusantara, M.Si

Pendidikan Sains dan Mathematics

Prof. Dr. Sri Rahayu, M.Pd.

Prof. Dr. Siti Zubaidah, M.Pd

Prof. Dra. Herawati Susilo, M.Sc. Ph.D

Dr. Supriyono Koes H. M.A.

Dr. Sutopo, M.Si

Dr. Lia Yulianti, M.Pd

Dr. Sentot Kusairi, M.Si

Prof. Dr. Kholis Sa'diyah, M.Pd,

Dr. Sukoriyanto, M.Si

3
Printed and Published by

State University of Malang Publisher

Member of the Indonesian Publishers Association (IKAPI) No. 059/JTI/89

Jalan Semarang 5 Malang, Post Code 65145, Indonesia

Telephone 62-341-562391, 62-341-551312, ext. 453

Email: umpenerbit@gmail.com

First Printing 2018



5

Proceeding ICoMSE 2017

International Conference on Mathematics, Science, and Education

Innovation of Mathematics, Science, and Education Research for Sustainable Development

Chairman	Hadi Suwono
Co-Chairman	Sri Rahayu Lestari Betty Lukiaty (Bio)
	Sudirman (Mat) Ery Hidayanto (Mat) Sentot Kusairi (Fis) Sunaryono (Fis) Aman Santoso (Kim) Surjani Wonoraharjo (Kim) Munzil (IPA) Vitaria Mustikasari
Secretary	Vivi Novianti Metri Dian (IPA) Kabag TU FMIPA
Under secretary division	Amy Tenzer
Under secretary division team	Andik Wijayanto Sulisetijono Siti Imroatul Maslikhah Sitoresmi Sueb Latifah Mustofa L. (Mat) Nuril Munfaridah (Fis) Muhammad Muchson (Kim) Erni Yulianti (IPA) Nursasi handayani
Treasurer	Sunarmi
Co-Treasurer	Andik Wijayanto
Web Administrator	Prico Kholil Putut
Internasional Publication	Taufik (Fis) Sri Rahayu Lestari (Bio) Dwi Listyorini (Bio) Sukoriyanto (Mat) Sumari (Kim) Safwatun Nida (IPA) Sutopo (Kim)



Pleno dan Paralel division	Nuning Wulandari Sofia Ery Rahayu Endang Suarsini Eko Sri Sulasmi Murni Saptasari Susriyati Mahanal Sunaryono (Fis) Nazriati (Kim) Vita Ria Mustikasari (IPA) Dahliatul Hasanah (Mat)
Sponsorship division	Abdullah Fuad (Fis) I Wayan Sumber Artha (Bio) Anugerah Ricky (Kim)
Transportation division	I Wayan Sumber Artha Triastono Imam
Logistic division	Agung Witjoro M. Karno (FMIPA) Masjhudi Hendro Permadi
Local accomodation division	Frida Nugrahaningsih Rina Tri Turani
Documentation	
National Reviewer/Editor	Biologi Prof. Amin Prof. Duran Prof. Utami Prof. Suhadi Dr. Umie Lestari Dr. Abdul Gofur Fisika Prof. Dr. Arif Hidayat, M.Si Dr. Markus Diantoro, M.Si Nandang Mufti, Ph.D Dr. Taufik Matematika Prof. Purwanto, Ph.D Prof. Dr. Toto Nusantara, M.Si Kimia Prof. Dr. Efendi Dr. Suharti Dr. Suryani Wonoraharjo Prof. Dr. Subandi, M.Si Anugerah Ricky Wijaya, D.Sc.



Internasional Editor

Pendidikan Sains dan Mathematics

Prof. Dr. Sri Rahayu, M.Pd.

Prof. Dr. Siti Zubaidah, M.Pd

Prof. Dra. Herawati Susilo, M.Sc. Ph.D

Dr. Supriyono Koes H. M.A.

Dr. Sutopo, M.Si

Dr. Lia Yuliati, M.Pd

Dr. Sentot Kusairi, M.Si

Prof. Dr. Kholis Sa'diyah, M.Pd,

Dr. Sukoriyanto, M.Si

Oenardi Lawanto, Utah State University, USA

Chokchai Yuenyong, Khon Kaen University, Thailand

Gereon Elbers, FH Aachen University of Applied Sciences,
Germany

Hadi Nur, Universiti Teknologi Malaysia, Malaysia

Akhmaloka, Institut Teknologi Bandung, Indonesia.

Duran Corebima, Universitas Negeri Malang, Indonesia

Purwanto, Universitas Negeri Malang, Indonesia



TABLE OF CONTENT

COVER.....	i
INTRODUCTION.....	ix
TABLE OF CONTENT	xiii

MATH¹ MATICS EDUCATION

1. The Development Of The Blended Learning Model In Trigonometry Material For Grade X Of SMK.....	1
2. Comparison of Metacognition Awareness of Mathematics and Mathematics Education Students Based on The Ability of Mathematics.....	10
3. Development Of CIRC Type of Cooperative Learning Based on Problem Posing to Increase Student's Creative Thinking Abilities Lesson Plans for Grade VII on Quadrilateral Materials	14
4. Blijah's Arithmetic Algorithm on Madurese Society in Probolinggo: An alternative approach in learning number operation	18
5. Creative Idea of Prospective Teacher in Mathematical Problem Posing Through Transformation	23
6. The Importance of Cognitive Psychology in Mathematics Learning and Students' Creativity.....	29
7. Design and Validation of Integrated Teaching Mathematics Books Information and Communication Technology (ICT) With CD Tutorial for Senior High School	33
8. Written Mathematical Communication in Solving Geometrical Problem of Eight Graders	37
9. Fifth Graders' Spatial Abilities of Cross Section Three Dimensional Object on Assessment Task	42
10. Learning Difficulties on Plane Analytical Geometry	47
11. The Effect of Multicultural to Algebra Achievement of Mathematics Education Student	51

PHYSI¹ EDUCATION

12. Problem Solving Ability and Metacognition Ability of High School Students in Tulungagung District	55
13. Using Virtual Labs to Improve Students' Understanding on Thermodynamics Concepts [RETRACT]	58
14. The development of e-assessment with learning management system for pre-service physics' teacher [RETRACT]	63

PHYSI¹

15. Potential of GIC/ZAA-Cu/Al ₂ O ₃ Composites as Dental Restoration Materials	67
16. The Effect of Sonication Duration on Characteristic NanoHydroxyapatite-SiO ₂ Composite and Mechanical Properties	75

BIOLO¹Y EDUCATION

17. Prospect of STEM-Project Learning to develop career in STEM field	79
18. Analysis of Biological Creative Thinking Skills at Senior High School Students.....	82
19. Characteristics of Highschool and Higher Education Student's Concept Map	85
20. Feasibility Study of Situ Bagendit as a Learning Resource of Freshwater Biology Courses	91



21.	Using Portfolio Assessment through Wikispaces to Assess Student Communication Skill in Ecosystem Subject	95
22.	Students' Communication Skills of Biology Education Department of Riau Islamic University, Indonesia	99
23.	The Critical Thinking Skills of Senior High School Students In Sumbawa NTB, Indonesia on Biology Learning	104
24.	Students' Critical and Creative Thinking Skills of Biology Lesson in Senior High School Malang City, Indonesia	110
25.	Problem Solving Skills And Cognitive Learning Outcomes Of Biology Lesson In Senior High School Students Of Malang, Indonesia	115
26.	Measurement of Students' Scientific Attitudes at STKIP Pembangunan Indonesia Makassar	118

BIOLOGY

27.	Monitoring Data of River Water Pollution In Malang City 2017	123
28.	The Study of Parasite Anisakis sp. on Big Eye Tuna (Thunnus obesus) is Prevention of Zoonosis Disease	128
29.	The Exploration of Ficus l. in Bangkalan-Madura	134
30.	Exploration of the Plant's Survival at Resort of Manufacture Nation Park II 'Coban Pisula' Bromo Tengger Semeru Nation Park	138
31.	Glucose and Lactic Acid Contents of Tube Paste Flour Additional Amylolytic Lactobacillus plantarum B110	143
32.	Gene Expression of Raw Starch Digesting α -Amylase (Amyl III) in <i>E. coli</i>	148

SCIENCE EDUCATION

33.	Development of Fern Plants Module Based on Contextual to Improve Learning Outcomes in SMA Islam Malang	151
34.	An Investigation of Student's 21st Century Skills Among Science Student in Malang	155
35.	Experiential Learning and the Effect of Self- Efficacy in Collaborative Instructional (Case Study At One R of School of Pantai Baru Sub-District Rote Ndao District)	159
36.	The Development Of Pop Up Book as Learning Media to Improve Effectiveness of Learning and Critical Thinking Ability on Respiratory System Material on Grade VIII	164
37.	The Analysis of Item Test of Biology Mid Semester Test in Odd Semester at Private Senior High School in Grade X, XI, and XII in Academic Year 2016/2017 in Blitar City, East Java	167
38.	Analysis of Biology Final Test in The Even Semester of The Tenth Grade at Public Senior High Schools in Blitar and Its Compatibility with Curriculum 2013	172
39.	Domino Science Card as an Innovation of Science Learning Media to Junior High School	176
40.	Design and Development of Student Worksheet with Writing-to-Learn Strategy on The Chemistry in Daily Life Topic for Hearing Impairment Students	180
41.	Identification of Indigenous Bacterial Consortia On Cadmium (Cd) Polluted Waters at Tasuruan District East Java Design	183
42.	Empowering Students' Cognitive Learning Outcomes through Search, Solve, Create and Share (SSCS) Learning Models with Video Media in Biochemistry	186

Students' Communication Skills of Biology Education Department of Riau Islamic University Indonesia

Nurkhairo Hidayati
 Graduate School of Universitas Negeri
 Malang Biology Education Department
 Islamic University Riau
 Riau, Indonesia
 nurkhairohidayati@gmail.com

Siti Zubaidah
 Biology Department,
 Universitas Negeri Malang
 Malang, Indonesia
 siti.zubaidah.fmipa@um.ac.id

Henry Praherdhiono
 Educational Technology Department,
 Universitas Negeri Malang
 Malang, Indonesia

Endang Suarsini
 Biology Department,
 Universitas Negeri Malang
 Malang, Indonesia
 endang.suarsini.fmipa@um.ac.id

Abstract— Communication skills are abilities that a person expresses thoughts, ideas, knowledge, or new information owned both verbal and nonverbal forms. These communication skills are essential to be possessed by students as a provision in doing various activities. The purpose of this study is to determine the communication skills of students of Biology Education Department of Islamic University Riau, Indonesia. The research method is a survey of 79 participants. To measure the students' communication skills, the researcher used a scoring rubric, which refers to the Common Core State Standards (CCSS). The communication skills aspects studied are speaking, writing, listening and nonverbal. The results showed that the aspects of communication skills from the highest to the lowest consecutively are speaking (75.21, good), listening (71.04, fair), nonverbal (70.73, fair) and writing (68.95, fair). Overall, the score of students' communication skills is 71.48 with the fair category. The students' skills need to be improved, especially in the aspect of writing in order to enhance students' communication skills, for instance through appropriate learning strategies

Keywords— communication skills, students, biology education

I. INTRODUCTION

The existence of the university is aimed to prepare students to become members of the community who have the ability to communicate academically and professionally. The role of universities in producing graduates in various fields is to meet market needs which is not only focused on academic achievement but also generic skills such as communication skills.¹⁾ Therefore, the students in the 21st century are expected to be part of a culture that values participation with many opportunities to start, produce, think critically, creatively, communicate, and work together.^{2,3)} If today's students want to compete in a globalized world then they must be able to become

proficient communicators^{1,4)}, have creativity, be able to think critically, and cooperate in accordance with the 21st century framework.⁴⁾ This framework describes the skills, knowledge, and skills that must be mastered so that students can be successful in their life and work.⁵⁾

Students need communication skills. Communication skills is a necessary skill to express thoughts, ideas, knowledge, or new information that is owned in the form of verbal and nonverbal. Through communication skills, students can remove communication barriers so as to communicate effectively.⁵⁾ Effective communication has been widely accepted as the basic skills needed to succeed in the workplace.^{7,8)} Students who have the knowledge and skills to negotiate with change will be able to adapt to the new situation.⁴⁾

Communication skills have a meaning as goal-oriented actions or sequences of actions that we can master and repeat in appropriate situations. An individual must have good communication skills and impact among recipients.⁸⁾ Effective communication skills are essential for students as prospective educators in classroom management and classroom interaction. The ability of educators in non-verbal communication such as expression plays an important role in learning activities.⁸⁾

Biology students as part of the community not only have the knowledge to communicate but also they must also have the skills to communicate effectively to be able to contribute to the social environment. Therefore, to bear students who are competent in performing certain roles, the student must obtain the provision of communication skills during the learning process.^{1,10)} Learning activities are essentially communicative activities. During the learning process, between lecturers and students are involved in the process of delivering messages, using media, and receiving messages.

Messages sent in the contents of the subject matter are poured into the symbols of communication both verbal and nonverbal.⁹⁾ The easiest way to explain communication through the general meaning is the means to get messages from one point to another. In fact, some initial opinions about communication emphasize the way messages are delivered.¹¹⁾

Common Core State Standards (CCSS) identifies several components of communication skills that are: 1) identify and use different types of verbal, communication such as conversation, debate, and persuasion, 2) engage in constructive dialogue with others, demonstrate communication skills such as attention, listening and understanding) involves skills in identifying, using and understanding various types of written communication such as formal, informational, and scientific, 4) paying attention and listening to various types of media for various purposes. Produce effective communication through various media such as oral, written, visual, nonverbal and technological, 5) using persuasive communication such as expressing views and choice neutrally.¹²⁾ Communication skills include verbal communication, written communication, social communication.¹⁾

Communication patterns in the learning and learning environment, between lecturers and students, students with students need to be well nurtured. During the lecturing process, the lecturers need to give the opportunity to the students to express their idea. Several previous studies have examined the students' communication skills showing that these skills are still low and need to be improved through various learning strategies.^{13,14,15)} If the opportunity given to the students is still lacking as if only certain students are active in the learning process.¹⁶⁾ In the end, they graduate with knowledge of science but do not know how to use communication skills.^{17,18)} Student communication skills can be improved through training,^{19,20,21)} and simulated sequentially,¹⁹⁾ through appropriate curriculum so communication skills can be achieved correctly at the time of graduation.²²⁾

The idea of the importance of communication begins with the idea that the problems experienced by humans can be caused by poor communication and can be solved with better communication. Communication skills are elements of a cultural pattern that has developed in certain historical circumstances in close connection with social practices related to modernization and globalization. Communication skills as technical skills can be improved by applying certain principles and techniques.¹¹⁾ The quality of communication is related to the activity and interaction between teachers and students.²³⁾ Learning communication skills can be forgotten if not applied and applied.²⁴⁾

Given the urgency of communication skills in determining one's life, then these communication skills need to be known as a provision in understanding various activities undertaken. Information about the communication skills of students of Biology Education Program of the Riau Islamic University, Indonesia so far is unknown because no research has examined it. Based on the background, it is necessary to do research on student communication skills at Biology Education Program of Riau Islamic University

II. METHOD OF THE RESEARCH

Descriptive research that has been conducted at Riau Islamic University by using the population of all students of Biology Education Program at Riau Islamic University. The sample of research is a student of Biology Education Study Program which follows the subject of Human Anatomy of Physiology with the number of students 79 people. The acquisition of communication skills data using an assessment rubric using scale 1 to 4 to show student achievement in each indicator of measured communication skills. The communication skills indicator used to assess communication skills is seen in Table 1

TABLE 1. Communication skills indicator

No	Aspek	Indikator
1	Speaking	Content Presentation Organization
2	Writing	Content Organization Syntax and grammar Display
3	Listening	Response Paraphrase dan Syntax
4	Non-Verbal	Attitude Gesture

Data on students' communication skills that have been collected through the observation sheet are then analyzed. Data analysis is done by calculating the scores that have been achieved by students for all indicators using the following formula

$$N = \frac{SC}{SM} \times 100$$

Information:
N = Value
SC = Achievement score
SM = Maximum score

After that, the results of the calculation of the value of communication skills are interpreted into several categories that are excellent (86-100), good (71-85), sufficient (51-70), and less good (≤ 50).²⁵⁾

III. RESULT AND DISCUSSION

Communication skills students in this study consist of four aspects of speaking, listening, nonverbal and writing. The results are presented in Table 2.

TABLE 2. The Value of Communication Skills

No	Aspect	Score	Category
1	Speaking	75.21	Good
2	Listening	71.04	Good
3	Non-Verbal	70.73	Good
4	Writing	68.95	Fair

Aspects of communication skills that occupy the highest score are speaking (75.21) while the lowest aspect is writing (68.95). The speaking aspect of the students is at the highest value because it is relatively easy to deliver orally, and has

been done from the beginning while the writing aspect occupies the lowest score because written communication requires perseverance and practice to master it. One study in Poland found that students had greater difficulty in written communication than orally. In this case, students need help in organizing and organizing the structure of reports and arguments.²⁶⁾ People have communicated since humans existed, especially oral traditions that are still done today.¹²⁾

The speaking aspect has three indicators: content, view, and organization. Figure 1 can give details of each indicator of the speaking aspect

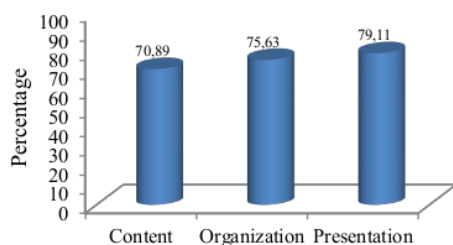


FIGURE 1. An indicator of Communication Skills for Writing Aspect

Figure 1, when viewed in more detail, it can be seen that the content indicator is much lower than other indicators. The low achievement of students on this indicator because they have not been able to show a comprehensive understanding of the topic presented. For example, when students convey an explanation of the physiological formation of urine, students should be able to explain its association with various other body systems. But the reality of the students is that they only focus on the material delivered that day. When interpreting the content of speech, it actually means the whole of the delivered.²⁷⁾ The content of the communication involves what is said, planned, or decided in an interaction.²⁸⁾ Bakhtin states when building speech, the thing done is to try to actively determine the information conveyed so that in turn, has an effect on the utterance. Another thing that needs to be considered is to determine the choice of speech, composition device, and finally, the choice of means.²⁷⁾ Verbal presentation of ideas has a lower average even though this is the most widely used skill during discussion and presentation.¹⁾

The viewing indicator on the speaking aspect is already in the good category (79.11). This indicator shows a good category because when students perform the presentation, they have used visual aids such as video and picture so that it helps in appearance and makes it easier to convey the topic. Topics or messages delivered in the course Anatomy of Human Physics requires a video in the explanation so that the lecturer of the subjects taught the students to display the videos and pictures. Elements in the communication process determine the quality of communication. Selection of certain media for message transmission is important in communication.²⁹⁾ In addition to media usage, another criterion that makes the display aspect higher is the sound that sounds clear. Intonation gives a general meaning of the whole speech. Intonation can be oriented in two directions ie toward the listener and toward the object of speech.²⁷⁾ The

volume, tone, velocity, and words used when conveying a message to others are aspects that need to be addressed in spoken communication.²⁸⁾

The results of the research on the listening aspect (Figure 2) consist of two indicators of response and paraphrase. The response indicator on listening aspect is higher than paraphrase indicator. The response shown by the students in the form of responding to the question posed so that other students can believe that delivered. Listening skills can be demonstrated through interest and attention to what is being said.¹⁾ Students also focus on what is delivered by other students. When another student asks a question, the student listening to the question is listening well. This shows that students have a good response in listening skills. According to Lunenberg,²⁹⁾ not everyone appreciates the importance of listening skills is not even caring enough to become actively involved with what people say, and not motivated to develop this skill

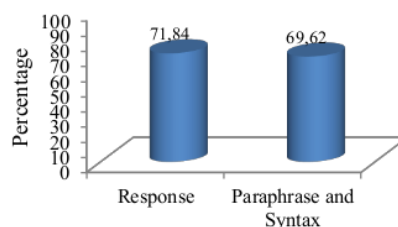


FIGURE 2. An indicator of Communication Skills for Listening Aspect

The low value of communication skills in paraphrase indicators (Figure 2) because when students listen to questions and opinions from other students, they have not been able to summarize the information that has been heard and resubmit it well. Listening skills are not only a response⁴⁾ it also related to the ability to understand information. Students need to show readiness to listen and give attention as others speak. With that, they will be able to remember what has been presented, identify key issues and give meaning What is being presented Listening requires acceptance and correct understanding of the other person's communication, identifying key issues and giving meaning to what is delivered.¹⁾ and without effective listening skills, messages can be distorted or ignored causing communication processes to fail.²⁶⁾ Oral communication is a collaborative process so that limitations in the ability to appreciate others' perspectives need to be avoided.³⁰⁾

The next aspect of communication skills is nonverbal. This aspect consists of two indicators of attitude and gesture (Figure 3). The values for both indicators of attitude and gesture are not much different. The value of both indicators is an insufficient category. This means that students have not shown good communication skills for both indicators. The low score on the indicator because when the students do the presentation, the students focused more on the slide power point so as not to attract the attention of the audience by making eye contact or movement of other body parts in communicating. Communication skills require the ability to convey verbal information reinforced by non-verbal communication so that the information can be received well. Nonverbal movements such as facial expressions and body

postures can send messages or information,^{28,29)} nonverbal communication includes important but unspoken signals exhibited by individuals such as appearance, eye contact, hand gestures and facial expressions.^{28,31)}

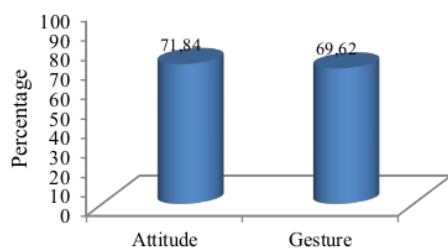


FIGURE 3. Communication Skills Indicators for Nonverbal Aspects

The last aspect of communication skills is writing. Writing is a written communication. Assessment of written communication in this study based on writings made by students about the health of the human body system. The skill of written communication is measured through the clarity of the main idea of writing, the flow of argument flowing smoothly and logically and written using the correct grammar. The value of communication skills for each indicator on the aspect of writing can be seen in Figure 4 below

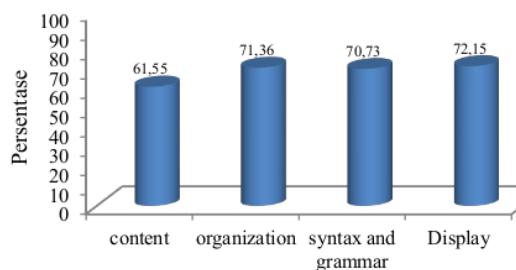


FIGURE 4. Indicators of Communication Skills for Writing Aspect

There are several indicators on the writing aspect of content, organization, syntax, and display. The content indicator on the writing aspect is lower than other indicators. The cause of the low indicator of the content because even though the students already have ideas for writing but the contents of the article has not been explained in detail and depth. Good written communication can be achieved when writing contains a deep topic coverage, clear main ideas and is supported by evidence. For written communication to be the right way of communication, one needs to filter content and data into easily understandable form.³²⁾

Presentation indicator on the writing aspect is higher than other indicators. Student written communication on this indicator is higher because the lecturer has set the writing format so that students make writing in accordance with the given format. In written communication, organization and correct use of grammar also need attention. The results of

this research indicate that there are still writings of students with interrelationships between paragraphs and unclear idea arrangements and incorrect use of spelling and punctuation. The most common mistakes found in student writings are wrong punctuation and grammatical errors that make it difficult to understand the meaning of the sentence. Written communication should be free of grammatical, spelling, and punctuation errors made as concise as possible. Like all forms of communication, written communication is also done with awareness of purpose and context (Staniforth, 2015). Written communication requires habituation and can take place effectively when the structure of the sentence is also well constructed so that it will help in expressing the idea more clearly. Written communication involves both the reader and the writer but they do not have to communicate at the same time.¹⁾

Communication skills of students of Biology Education Studies Program at Riau Islamic University, in general, are good enough. Among the four aspects of communication skills studied are speaking, listening, nonverbal and writing, then the speaking aspect tops the list followed by listening, nonverbal and writing aspects. Communication skills on students have an important role in interacting. The quality of students' social life is also determined in terms of how well they communicate. Therefore, communication skills need to be taught explicitly or taught into the learning process.³³⁾

IV. CONCLUSION

Students' Communication skills of Biology Education Program in Education Faculty of Riau Islamic University have quite a good category. Aspects of communication skills on students with the highest category are speaking (75.21) while the lowest category is writing (68.95). Therefore, further research recommendation is to conduct research with the aim to improve student communication skills. Improving communication skills requires a learning strategy that is able to facilitate students in performing communication skills.

REFERENCES

- [1] Z. H. Iksan, E. Zakaria, T. S. M. Meerah, K. Osman, D.K.C. Lian, S.N. Mahmud, P. Krish, Communication skills among university students, *Procedia - Social and Behavioral Sciences*. 71 – 76 (2012)
- [2] L. L. Fong, G. K. Sidhu, C. Y. Fook, Exploring 21st century skills among postgraduates in Malaysia, *Procedia - Social and Behavioral Sciences*, 130 – 138 (2013)
- [3] C. Kyunghee, L. Hyunju, S. Namsoo, K. Sung-Won, Re-Conceptualization of Scientific Literacy in South Korea for the 21st Century, *Journal Of Research In Science Teaching*. 48, 670-697 (2011)
- [4] NEA, An Educator's Guide to the "Four Cs" Retrieved Agustus 2017 from <http://www.nea.org/assets/docs/A-Guide-to-Four-Cs.pdf>, (2012)
- [5] P21, Framework for 21st Century Learning. Retrieved Agustus 07, 2017, from http://www.p21.org/storage/documents/docs/P_Framework_Definitions_New_Logo_2015.pdf, (2015)
- [6] MTD, Effective Communication Skills, (MTD Training and Ventus Publishing ApS, United Kingdom, 2010)
- [7] A. W. A. B. Mohd Abd Wahab & N. A. Shareela Binti Ismail, Communication Skills and its Impact on the Marketability of UKM Graduates, *International Journal of Higher Education*. 3, (2014)
- [8] E.Waite., K.Evans., N.Kersh, The challenge of establishing sustainable workplace "Skills for Life" provision in the UK: organizational "strategies" and individual "tactics", *Journal of Education and Work*. 27, 199–219 (2014)

- [9] S. B. Bee, The impact of teacher's communication skills on teaching: reflections of pre-service teachers on their communication strength and weaknesses, *Humanising language teaching Journal*. **14** (2012)
- [10] F. M. Ihmeideh, A. Ahmad, K. A. Al-Dababneh, Attitude toward communication skills among students' teachers' in Jordanian Public Universities, *Australian Journal of Teacher Education*. **35**, 1-11 (2010)
- [11] W. F. Eadie, *21st Century Communication: A Reference Handbook*, SAGE Publications, Inc, United States of America, (2009)
- [12] L. Greenstein, *Assessing 21st Century Skills: A Guide to Evaluating Mastery and Authentic Learning*, Sage Publication Ltd, United Kingdom, (2012)
- [13] H. Fitriyani & U. Khasanah, Peningkatan Kemampuan Komunikasi Matematis Mahasiswa Calon Guru Melalui Pembelajaran Investigasi, *Proceeding The Progressive and Fun Education Seminar*, (2016)
- [14] Y. Rahmadhar & Ferawati, Peningkatan Kemampuan Berkomunikasi Mahasiswa Fisika Uhamka Melalui Penerapan Pola Interaksi Multi Arah Pada Kegiatan Praktikum, *Proceeding Penelitian Bidang Ilmu Eksakta*, (2011)
- [15] B. Yonata, Keterampilan Komunikasi Mahasiswa Pendidikan Kimia Unggulan 2013 dalam Bahasa Inggris Pada Materi Kimia Dalam Pembelajaran Kooperatif, *Proceeding Seminar Nasional Kimia. Jurusan Kimia FMIPA Universitas Negeri Surabaya*, Surabaya (2014)
- [16] S. K. Fajarwati, Penerapan Pembelajaran Berbasis Masalah Menggunakan Pendekatan *Open Ended* untuk Meningkatkan Keterampilan Berkomunikasi dan *Digital Literacy* Pada Mata Kuliah Etika Profesi, *Proceeding Seminar Nasional II Tahun 2016, Kerjasama Prodi Pendidikan Biologi FKIP dengan Pusat Studi Lingkungan dan Kependudukan (PSLK) Universitas Muhammadiyah Malang*, Malang, (2016)
- [17] Awang & Daud, Improving Communication Skills Through the Learning Approach Towards the Environment of Engineering Classroom" in *Procedia - Social and Behavioral Sciences*. **195**, (2015)
- [18] Janthon, N. Songkram, P. Koraneekij, Work-based blended learning and technological scaffolding system to enhance communication skills for caregivers under Local Administrative Organization, Ministry of Interior, Thailand (Part I), *Procedia - Social and Behavioral Sciences*. **174**, (2015)
- [19] D. L. Reising, D. E. Carr, S. Gindling, R. Barnes, D. Garletts, Z. Ozdogan, An analysis of interprofessional communication and teamwork skills acquisition in simulation, *Journal of Interprofessional Education & Practice*. **8**, (2017)
- [20] F. Krause, G. Schmalz, R. Haak, K. Rockenbauch, The impact of expert- and peer feedback on communication skills of undergraduate dental students – a single-blinded, randomized, controlled clinical trial, *Patient Education, and Counseling*. **xxx**, (2017)
- [21] M. Claramita, T. Tuah, P. Riskione, Y. S. Prabandari, C. Effendy, Comparison of communication skills between trained and untrained students using a culturally sensitive nurse-client communication guideline in Indonesia, *Nurse Education Today*. **36**, (2016)
- [22] C. Bachmann, S. Roschlaub, S. Harendza, R. Keim, M. Scherer, Medical students' communication skills in clinical education: Results from a cohort study, *Patient Education and Counseling Journal*, (2017)
- [23] F. M. Yusof & H. Halim, Understanding Teacher Communication Skills, *Procedia - Social and Behavioral Sciences*. **155**, (2014)
- [24] I. Taveira-Gomes, R. Mota-Cardoso, M. Figueiredo-Braga, Communication Skills in Medical Students – An Exploratory Study Before and After Clerkships, *Porto Biomedical Journal*. **28**, (2016)
- [25] C. A. Taglieri, S. J. Crosby, J. W. Ferullo, Implementation of a Communication Skills Laboratory, *Currents in Pharmacy Teaching and Learning*. **6**, (2014)
- [26] M. J. Riemer, Communication Skills for the 21st Century Engineer, *Global Journal of Engng Educ*. **11**, (2007)
- [27] T. V. Akhutina, The Theory of Verbal Communication in the Works of M.M. Bakhtin and L.S. Vygotsky", *Journal of Russian and East European Psychology*. **41**, (2003)
- [28] B. Staniforth, Communication Skills in Social Work, *International Encyclopedia of the Social & Behavioral Sciences*. **4**, 2015, pp. 284-290
- [29] F. C. Lunenburg, Communication: The Process, Barriers, And Improving Effectiveness, *Schooling Journal*. **1**, (2010)
- [30] R. M. Krauss, The Psychology of Verbal Communication, *International Encyclopedia of the Social and Behavioral Sciences*. (2002)
- [31] A. Hans & E. Hans, Kinesics, Haptics and Proxemics: Aspects of Non-Verbal Communication, *Journal Of Humanities And Social Science*. **20**, (2015)
- [32] H. Wallace & C. Roberson, *Written and Interpersonal Communication: Methods for Law Enforcement*, Prentice Hall, USA, (2006)
- [33] S. Zubaidah, Keterampilan Abad ke-21: Keterampilan yang diajarkan Melalui Pembelajaran, *Paper Seminar Nasional Pendidikan with theme "Isu-isu Strategis Pembelajaran MIPA Abad 21, Program Studi Pendidikan Biologi STKIP Persada Khatulistiwa Sintang, Kalimantan Barat*, (2016)

ORIGINALITY REPORT

19%

SIMILARITY INDEX

18%

INTERNET SOURCES

6%

PUBLICATIONS

4%

STUDENT PAPERS

PRIMARY SOURCES

1

[slidelegend.com](https://www.slidelegend.com)

Internet Source

13%

2

Submitted to Universitas Negeri Jakarta

Student Paper

1%

3

[zombiedoc.com](https://www.zombiedoc.com)

Internet Source

1%

4

www.researchgate.net

Internet Source

1%

5

sinta3.ristekdikti.go.id

Internet Source

1%

6

berkarya.um.ac.id

Internet Source

1%

7

"Preface", Journal of Physics: Conference Series, 2020

Publication

1%

8

"Sustainability Assessment Tools in Higher Education Institutions", Springer Science and Business Media LLC, 2013

Publication

1%

Exclude quotes Off

Exclude matches < 1%

Exclude bibliography On