



DEVELOPING VIRTUAL COMMUNICATION SKILLS IN ONLINE LEARNING BASED ON MODIFIED PBL DURING THE COVID-19 PANDEMIC

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ABSTRACT

Article History

Received: 30 November 2020

Revised: 22 February 2021

Accepted: 24 March 2021

Published: 12 April 2021

Keywords

COVID-19 pandemic

Modified PBL

Online learning

Virtual communication skills

Varanus salvator

WhatsApp Group (WAG)

Zoom meetings.

This study aims to determine the virtual communication skills of students in the Vertebrate Zoology course, the subject of the Reptile Class with the example of the *Varanus salvator* species. The research was conducted by survey method using an adaptation observation sheet from the 2012 Greenstein instrument. Data collection was carried out on modified online Problem Based Learning (PBL) using Zoom meeting and WhatsApp Group (WAG). While presentation and organizing stages were carried out by class discussion on Zoom, the problems that have been formulated were discussed by each group using a WAG. The data obtained were analyzed quantitatively, using the percentage formula (Akbar, 2013) in the book *Learning Device Instruments* and showed the results that the percentage of oral communication skills was 86.73%, of the skills to understand the intent/purpose of communication was 85.65%, of the skills to use communication strategies was 86.57%, and of presentation skills was 85.19%, with each criterion falling in the category 'Exceeded Expectations'. Meanwhile, viewing the percentage results and aiming the target of 84.57%, the two receptive communication skills listening and reading were included in the 'Satisfactory' category. The general percentage of communication skills of 85.16% as average was included in the category 'Exceeding Expectations'. This finding suggests that communication which included oral communication skills, receptive communication skills, understanding the purpose of communication, using communication strategies, communicating clearly for a purpose, and presentation skills can be achieved virtually.

Contribution/Originality: This study contributes to the domain of skills acquisition that during the COVID-19 pandemic, despite social distancing students' virtual communication skills can be achieved through online learning using a modified PBL through WAG and Zoom Meeting.

1. INTRODUCTION

One of the realizations of a better future for the nation and to become a successful person is by mastering 21st-century skills that are relevant to the four pillars of life, namely learning to know, learning to do, learning to be and

learning to live together (Zubaidah, 2017). 21st-century skills can be practiced in all disciplines (Redhana, 2019). The success of this hope requires cooperation between education providers and the community as education users. Education that is able to produce human resources who have complete competences is known as 21st Century competence (Wijaya, Sudjimat, & Nyoto, 2016).

Formal learning in fulfilling 21st-century competencies is required to apply 4C skills (Critical thinking, Communication, Collaboration, and Creativity). These four skills are able to transform humans into superior characters (Sugiyarti, Arif, & Mursalin, 2018) and can be used as provisions for taking part in the worldly activities. (Wijaya et al., 2016). One of the most important skills for realizing the 4Cs is communication skills; through which other skills can be developed. Critical thinking skills can be conveyed to others only through communication skills; a person's collaboration skills with others can be realized only through communication skills; creative skills that appear in a person can also be expressed to others through communication skills.

Communication skills are very important needs in everyday life. Individuals who are skilled at communicating are flexible, and competitive wherever they are. Communication is a mode, which helps each of us to transfer messages, thoughts, feelings, imagination and ideas (Khambayat, 2017). Communication skills can be nonverbal and verbal (Rao, Charyulu, & Omatam, 2016). In addition to there is also visual communication (Briliana & Destiwati, 2018). In short, communication skills can be in the form of reading skills, writing skills, listening skills and speaking skills (Khambayat, 2017). The range of communication skills can be carried out in an interdisciplinary, international and intercultural manner (Vorderer, 2016). In today's global world, it is necessary to communicate with the outside world effectively and efficiently (Rao et al., 2016). In accordance with advances in information technology, communication is mostly carried out online (Permassanty & Muntiani, 2018; Vorderer, 2016).

Due to COVID-19 pandemic learning has switched over to online methods to avoid transmission and to avoid social distancing and physical distancing (Muhyiddin, 2020; Yunus & Rezki, 2020). The policy of the Ministry of Education and Culture in Indonesia in responding to the COVID-19 pandemic for students, educators, education personnel, and all members of education units, prioritizes the principles of health and safety with rules for conducting distance learning (Junep & Frenky, 2017). The Indonesian Directorate of Higher Education provides facilities in the form of whitelist internet services for Higher Education sites, and the Education and Culture Office in collaboration with national and international content providers. Online learning is a leap in learning methods that must be done in accordance with the national and international educational norms.

Online learning can be done by combining various methods such as Google classroom, Zoom, WhatsApp (WA) and others. Dual communication occurs between teachers, and students through technical media (text, audio, video, or computer) used to deliver the learning content. COVID-19 creates a new culture of communicating virtually. There is a gap between the demands of the 21st century, that students must have 4C skills, one of which is communication skills with the rules that have occurred in various countries including Indonesia, namely to carry out lockdowns and social distancing during the COVID-19 pandemic. Alternative learning models during a pandemic can be done by modifying various learning models such as modification of Problem Based Learning (PBL). Virtual learning through the integration of Zoom meetings and WhatsApp Group video calls (WAG) related to student communication skills can be analyzed.

2. LITERATURE REVIEW

Communication skills are essential requirements in the learning process. Through perfect communication skills, aims and objectives of learning can be conveyed to students perfectly; and so, can ideas, thoughts, opinions, knowledge, experiences and even feelings. Therefore, through communication there is a process of exchanging or sharing information between information senders and information recipients (Masdul, 2018; Shonubi & Akintaro, 2016; Suprpto, 2017). During the time of the COVID-19 pandemic, various countries implemented a lockdown. Indonesia carried out a special lockdown for areas where people were infected with COVID-19, and where people

were not found infected with COVID-19, large-scale social restrictions in all areas were carried out (Muhyiddin, 2020; Yunus & Rezki, 2020). All learning process was switched over to online methods at all levels of education, from Kindergarten, Middle School to Higher Education.

The function of communication skills, in general, is to establish social relationships among humans in various fields, from politics, economics, psychology, health, education and others, in a transdisciplinary, interdisciplinary and even multidisciplinary manner (Bucata & Rizescu, 2017; Coe, Bruce, & Ratcliff, 2017; Liang, Tian, Zhang, & Tian, 2020; Masdul, 2018; Obregón & Tufte, 2017). This function of communication in learning is known as instrumental communication, which is intended to be informative and persuasive, in the sense that a lecturer or a student who acts as an informant wants the information to be conveyed to be accurate and worthy of being known.

Communication in learning has four functions: 1) social communication; 2) expressive communication; 3) ritual communication; 4) instrumental communication (Masdul, 2018). Social communication function refers to building of functions self-concept, self-actualization, gaining happiness, avoiding tension and pressure, and creating good cooperation between fellow students and between students and lecturers during learning. The expressive communication function proposes that during learning, students and lecturers can express their emotions or feelings through verbal messages, for example refuting different opinions, sympathizing with their friends' way of giving suggestions and input, and so on. It can also be conveyed non-verbally, for example, when a group member writes the results of a discussion incorrectly, he changes it immediately. Ritual communication in learning is often carried out through such habits such as reading prayers together before the lesson begins, conducting religious ceremonies and commemorating national holidays. Those who are accustomed to participating in this ritual communication are committed to bringing traditions to their family, ethnicity, nation and country. Instrumental communication, carried out in the learning process, aims to convey information, teach morals and values, provide advice and motivation, change attitudes, and entertain learners through recreation.

There are various principles of communication in learning: 1) Respect; 2) Empathy; 3) Audibility; 4) Clarity; 5) Humility (Masdul, 2018). Respect is an attitude of respect; lecturers are required to be able to understand their students and be able to appreciate their opinions. Mutual respect in communication during this learning will transform the effectiveness of learning into a fun process. Empathy is respect or a sense of understanding, and learning based on understanding between lecturers and students or vice versa or even among students. Learning in such a case will be conducive without any psychological obstacles. Audibility means that information must be well received, for which the learning material acts as communication media. Clarity can be interpreted as the clarity of the meaning and content of information. This is very important in learning so that there are no multiple interpretations. Humility is defined as establishing communication during learning with a humble attitude so that other people feel their importance and a two-way communication can be easily established.

3. METHOD

This research was conducted through a survey method using observation sheets, based on a modified PBL online learning model. The study focused on the Vertebrate Zoology subject of class Reptilia using one example of the species *Varanus salvator*. Learning was carried out using an integration of Zoom meeting and WAG. The orientation and organization stages were carried out on the Zoom meeting attended by all students taking the course. They discussed formulating problems from the material that had been shared in the form of PowerPoints (PPT) and videos about *V. salvator*. The formulated problems were discussed in order to collect data and compile reports through WAG by each student group consisting of three to four students. There were 27 students taking this course, and 8 student groups were formed. During the discussion in each group, the researcher was present to watch the discussion and fill out the observation sheet about the communication skills of each student. The reflection and evaluation of each group were presented and discussed in class through Zoom meetings. Observation of communication skills was carried out on two lecture topics six times: two discussions at the orientation and

organizing stage over Zoom, two discussions on data collection and report preparation over WAG, and two discussions on reflection and evaluation over Zoom. The observation sheet used instruments adapted from Greenstein (2012) and the observation data was analyzed quantitatively.

4. RESULTS

The results of research on student communication skills were observed using an observation sheet consisting of six communication skills criteria, namely: 1) oral communication; 2) receptive communication: listening, reading, seeing; 3) understand the purpose / purpose of communication; 4) using a communication strategy; 5). communicate clearly for a purpose; 6) presentation skills. Each of the communication criteria received the highest score of 4 and the lowest of 1 (Greenstein, 2012). Communication skills criteria were analyzed using percentages and resulted in the categories presented in Table 1.

Table-1. Communication Skills Categories for Each Criteria

Skill criteria	Actual Score	Maximum Scorer	%	Category
Oral communication	562	648	86.73	Exceeds expectations
Receptive communication: listening, reading, seeing	533	648	82.25	Satisfactory
Understand the purpose / purpose of communication	555	648	85.65	Exceeds expectations
Using a communication strategy	561	648	86.57	Exceeds expectations
Communicate clearly for a purpose	548	648	84.57	Satisfactory
Presentation skills	552	648	85.19	Exceeds expectations

Students' virtual communication skills varied for each criterion, the lowest was for receptive communication with a percentage of 82.25, meaning 'satisfactory'; the second was 'communicates clearly for a purpose' with a percentage of 84.57, meaning 'satisfying'; the third was 'presentation skills' with a percentage of 85.19, meaning it 'exceeds expectations', the fourth was 'understanding the purpose of communication' with a percentage of 85.65, meaning that it 'exceeds expectations'; and the highest was 'oral communication' with a percentage of 86.73, meaning that it 'exceeds expectations'. The comparison of each student's virtual communication criteria in Vertebrate Zoology learning are presented in Figure 1.

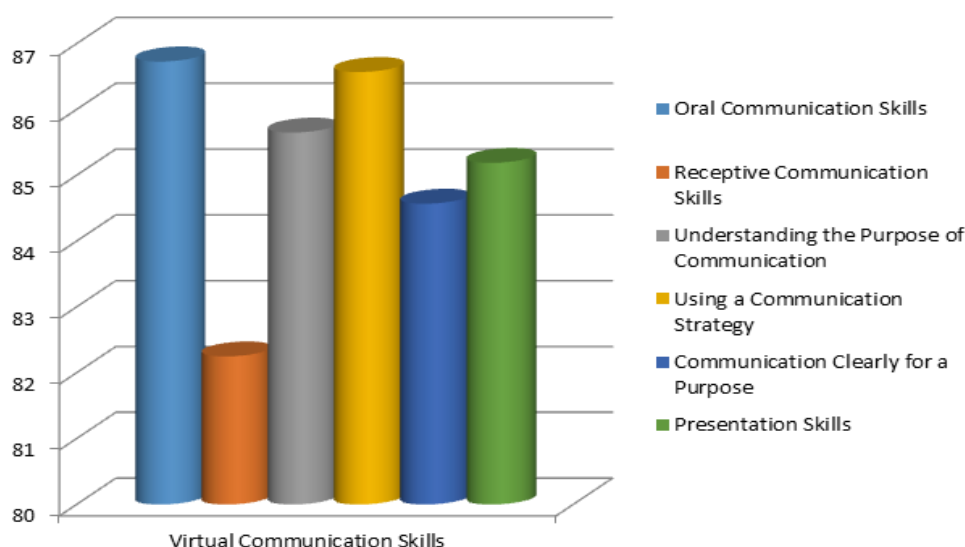


Figure-1. Comparison of student virtual communication ability criteria in vertebrate zoology learning.

Students' virtual verbal communication using Zoom meetings and WAG revealed a percentage of 86.73, which means that the meaning 'exceeds expectations.' The criteria for oral communication skills were the highest among other communication skills criteria. The dimensions of oral communication skills are presented in [Table 2](#).

Table-2. Dimensions of oral communication skills.

Aspect	Score	Criteria
Oral communication skills	4	Example
		Clarity, speed, volume and articulation are all powerful and can enhance communication.
	3	Expert
		Clarity, speed, volume and articulation are good enough for communication purposes.
	2	Basic
		There is only one essential component of oral communication.
1	Beginner	
	It is difficult to hear and follow the flow of communication.	

Receptive communication which includes listening or listening, reading, and seeing ([Greenstein, 2012](#)) was observed virtually on students using Zoom meetings and WAG, which produced a percentage of 82.25, resulting in meaning as 'satisfying'. The dimensions of receptive communication skills from the research results are presented in [Table 3](#).

Table-3. Dimensions of receptive communication skills.

Aspect	Score	Criteria
Receptive communication skills	4	Example
		Can distinguish facts from opinions, identify the meaning of the message / information, summarize main ideas, identify supporting ideas.
	3	Expert
		Can determine facts and acknowledge persuasion, identify and summarize main ideas.
	2	Basic
		Can identify facts in a message / information. Skills develop in interpreting messages.
1	Beginner	
	Can restate the facts. Some understand the purpose of the message / information.	

Virtual understanding students' communication goals using Zoom meetings and WAG resulted in a percentage of 85.65, which means it exceeds expectations. The dimensions of understanding communication purpose are presented in [Table 4](#).

Table-4. Dimensions of understanding communication purpose.

Aspect	Score	Criteria
Understand the purpose of communication	4	Example
		Identify and interpret messages and draw logical conclusions.
	3	Expert
		Translating messages well.
	2	Basic
		Understands the main ideas in a message but needs help understanding them.
1	Beginner	
	Understand most of the facts but unable to understand the meaning of the message conveyed.	

Using virtual communication strategies, and use of Zoom meetings and WAG produced a percentage of 86.57, which meant exceeds expectations. The dimensions of using a communication strategy are presented in [Table 5](#).

Table-5. Dimensions of using a communication strategy.

Aspect	Score	Criteria
Using communication strategies	4	Example
		Produce clear, accurate, and reflective communication.
	3	Expert
		Communication is usually understandable, with a few minor mistakes.
	2	Basic
		Able to produce basic communication.
	1	Beginner
		Not able to communicate clearly, accurately, reflectively, and do not have basic communication skills.

Communicating clearly for a specific purpose the students using Zoom meetings and WAG produced a percentage of 84.57, which means satisfying. Dimensions clearly communicate for a purpose are presented in Table 6.

Table-6. Communicate clearly for a purpose.

Aspect	Score	Criteria
Communicate clearly for a purpose	4	Example
		Always understand the purpose of communication, then organize and present information to meet those goals.
	3	Expert
		Often understand the purpose of communication, then organize and present information to meet those goals.
	2	Basic
		Rarely understand the purpose of communication, thus reducing the quality of information and presentation
	1	Beginner
		Confused about the purpose of the communication and having difficulty focusing on content and process.

The students' virtual presentation ability using Zoom meetings and WAG resulted in a percentage of 85.19, which meant exceeds expectations. The dimensions of presentation ability are presented in Table 7.

Table-7. Presentation Skills.

Aspect	Score	Criteria
Presentation skills	4	Example
		Always ready and appropriately responds to the audience by adjusting the tone of voice, depth, speed and position when presenting.
	3	Expert
		Serene presentation. Usually aware of the audience and trying to respond to their cues.
	2	Basic
		Has difficulty being calm, professional, and responsive to the audience during the presentation.
	1	Beginner
		Presentation has no professional component. Unaware of audience reactions.

Virtual communication skills from the six aspects that have been discussed, generally show categories exceeding expectations. This is presented in Table 8.

Table-8. General virtual communication skills.

Criteria	Actual Score	Maximum Score	%	Category
General communication skills	3311	3888	85.16	Exceeds expectations

5. DISCUSSION

Communication skills required for online learning are called virtual communication skills. The function of virtual communication in learning is to express ideas, thoughts, opinions, knowledge and all information 'virtually' among students /or between lecturers and students, and vice versa. Virtual communication skills in this learning consist of oral communication skills, receptive communication skills, understanding the purpose of communication, using a communication strategy, communicating clearly for a purpose, and presentation skills.

5.1. Oral Communication Skills

Oral communication skills are like the "heart" of learning, because oral communication is an important dimension of communication in education. Communication skills are very essential to achieve success in learning. Communication skills include expressing oneself verbally, and understanding other people's statements. Communication skills are very important because everyone has a need to put forward ideas, in order to process thoughts and find a basis for solving problems (Aulia, Suwatno, & Santoso, 2018). Other studies have concluded that oral communication skills are needed, especially by graduates of business education, and scholars in various fields of knowledge such as marketing; therefore, soft skills or exemplary communication skills play an important role in the effectiveness of interpersonal communication and contribute highly to workforce performance and overall productivity. Recruitment of workers in various fields is also based on the ability of prospective workers to communicate orally. Oral and written communication skills are required in educational curricula that require this ability, for example business education and teacher education (Okoro, Washington, & Thomas, 2017). Oral communication functions in learning include: 1) informative function, requiring oral communication to convey knowledge 2) heuristic function, requiring oral communication to learn through asking questions or seeking explanations. Without communication all channels of information are closed.

In the early stages of learning, oral communication is very important for interaction, social relations, cooperation, and to build a sense of mutual responsibility. Oral communication is the heart of pedagogy. Educators help children develop oral language skills both directly through linguistic interactions with them and indirectly by creating an environment rich in learning stimuli (Mousena & Sidiropoulou, 2018). Oral communication skills are a form of scientific literacy, important for students to master to live in the 21st century (Suwono, Budi, Ramadani, & Sukmawati, 2016).

In line with the increasing development of information technology for internet users around the world, face-to-face communication has faded away and turned into virtual communication. In the beginning, virtual communication was used for online games, Facebook, Twitter, Instagram and others which were interpersonal communication (Briliana & Destiwati, 2018; Junep & Frenky, 2017; Permassanty & Muntiani, 2018). However, with the COVID-19 pandemic, virtual communication was used in the learning process. Virtual oral communication is very popular with today's students, students who in face-to-face learning appear quiet, through learning using Zoom meetings and WAG enthusiastically convey their ideas through virtual communication, so that the criteria for virtual oral communication are the highest compared to other communication criteria. The results of other studies show that PBL has been shown to improve students' oral communication competence (Mandeville, Ho, & Valdez, 2017).

Due to COVID-19, virtual communication has become an alternative means of communicating for the benefit of communication in general and learning purposes, through Zoom meetings, WAG video calls and like. Ideas, opinions, experiences, knowledge and all information can be conveyed perfectly from the speaker to the interlocutor. Even interlocutors can see the face and expression of the speaker, so as not to detract from the purpose of communication. Through virtual oral communication, it can save time, effort and money because students do not have to travel from home to campus which of course requires a lot of time, effort and money. Besides that, learning

through virtual communication can meet the rules during the COVID-19 period for lockdown and physical distancing (Muhyiddin, 2020; Yunus & Rezki, 2020).

Oral communication skills can be realized perfectly if someone has sufficient provisions to be communicated. This provision is in the form of knowledge and experience, which can lead to ideas and opinions derived from hearing the information, reading the information, listening to the information and always looking for the information. Such information obtained is analyzed and generated into new ideas and opinions. Therefore oral communication skills are closely related to good listening and speaking skills, and good reading and writing (Hussain, 2018). In other words, oral communication skills can be a role model (example), if someone masters receptive communication skills (Aji, 2016; Halley, 2020).

5.2. Receptive Communication Skills

Receptive communication observed in this study includes: listening, reading, seeing, hearing or listening to messages/information conveyed by lecturers and other students during class discussions in Zoom meetings and WAG, with satisfying meanings. Listening is an activity with full attention and understanding so that the listener is able to capture the contents of messages/ information and understand the meaning of communication such as mimics and expressions; Being a perfect listener makes a person excel in various forms of life, since by focusing on listening, he can receive complete information. Such a perfect listening ability can summarize the main ideas, being able to distinguish whether the material presented by a friend is relevant or not, or being able to conclude correctly, and being able to interpret the information obtained.

Listening is influenced by intelligence, concentration, interests, emotions, physical condition and clarity of voice. Because class discussions through Zoom meetings and WAG are highly influenced by signals, some students live in locations far from internet transmitters so that some students often drop out and reconnect. Considering that listening is influenced by many complex factors, like reading and seeing, the learning material cannot be completely listened to, so that in this study receptive communication skills fall in the satisfactory category. The ability to hear is also influenced by emotions, age, mental health, anatomy and physiology of the hearing organs (Bodie et al., 2019; Halley, 2020). Students who took this Vertebrate Zoology course were between the ages of 19 and 21 years, while the adults were aged 24 years and above. In young age, students often do not exhibit full responsibility in behavior, so they do not focus on listening to the learning material or to their conversation partners.

Listening also depends on aspects of meaning and content. Listening skills can be divided into four types: 1) analytical listening, or listening/hearing information according to facts; 2) conceptual listening, or listening/hearing information based on concepts; 3) connective listening, or listening/hearing information based on the interests of people, groups, communities, and audiences; 4) reflective listening, or listening/hearing information based on personal goals and interests (Bodie et al., 2019). Listening skills underlie effective communication (Coudray, 2020; Sari, 2016). Effective communication is an activity of sending information from one person to another, and the activity of sending this information generates benefits for both parties. The problem of effective communication is what most Indonesians face today. They are less trained to be good listeners, resulting in less effective communication (Sari, 2016). No matter how good someone's communication, it is ineffective without listening skills. A special attention is given to listening in pedagogy of higher education (Coudray, 2020).

Apart from listening, reading is another important skill in supporting communication skills. Reading must be balanced with the ability to understand the meaning and content of reading. The skills to understand the meaning and content of reading are based on the ability to determine the main sentence (Zaenuddin, Djuanda, & Syahid, 2017). Fluency in reading orally is an important skill needed by a reader because fluency in reading orally is assumed to be able to support the ability to understand the meaning and content of reading and affect accuracy in communication skills (Rifa'i, 2016). There are three steps in reading activities; 1) pre-reading; 2) during reading activities; 3) after reading (Aji, 2016; Anaktototy & Huwae, 2020). In pre-reading activities, a person is expected to

be motivated and predict reading content, in pre-reading that is commonly done by a reader is also known as previewing. The reader previews his experiences related to the topic, asks questions related to titles, predicts reading based on previewing, identifies text structures, reads for major ideas, reads the introduction and conclusion of the text (Anaktototy & Huwae, 2020). In during reading phase, a person reads and pays close attention to the line by line of his reading to get the content of the reading. In post-reading activities, a person deduces the meaning and the content of reading and takes advantage of the reading (Aji, 2016).

The third receptive communication skill is seeing, the skill of seeing is defined as an effort to witness using the eye senses. Foresight in writing, pictures, posters and the like can support the skill of interpreting the contents of a reading, pictures, posters and the like. Intelligence seeing the interlocutor through mimics, facial expressions, gestures and body movements will support the ability to interpret the intentions and goals of the interlocutor apart from the words he is saying.

5.3. *Understanding the Purpose of Communication*

Effective communication is two-way communication, wherein one partner listens carefully so that the information referred to by the speaker can be received perfectly and can be given an appropriate response. Communication skills play an important role in developing one's leadership skills, and in preparing students for their future careers (Masdul, 2018; Suprpto, 2017). Listening and speaking are basic skills, and if the foundation is strong, these skills can produce right conclusions (Hussain, 2018). We recommend that we become first good listeners, by listening to words of others, and by listening to all-natural sounds in the environment. This will enable us to grasp the purpose of communication perfectly.

The purpose of communication is to transfer information from one person to another (Rao et al., 2016). Without communication, ideas and opinions that arise in a person are not conveyed to anyone. The purpose of communication hence is to make sure that ideas, opinions, knowledge and information referred to by someone can be conveyed and understood by others. The creation of agreements, exposure to science and technology, and delivery of information are through communication. Therefore, for communication to be conveyed, communication must go through an interactive and participatory process from all parties. Communication is a pillar on which information is delivered (Ruler, 2018; Tutiasri, 2016).

The purpose of communication in learning is also to inform teaching material, motivate students to learn, change beliefs in the right direction which science is still trying to recognize. It also requires to change attitudes and behavior of students towards scientific attitudes and behavior, and understand scientific actions (Ubaidillah, 2016). This communication process is of course inseparable from the objectives of a topic or subject in lectures, and to achieve the process of delivering information. Of course, it must be supported by the media as a means of information, which could be an internet signal in the form of Wi-Fi or a data packet, Mobile (HP), or Laptop. The purpose of communication can be achieved if the information conveyed by the communicator can be received properly or equally by the communicant, so that there is no misperception (Suprpto, 2017).

In this study understanding the purpose of communication has exceeded expectations with a percentage of 85.65, which means that students have been able to understand the purpose of communication during learning through Zoom meetings and WAG. Virtually discussion becomes interesting which help students realize learning goals, identify problems, interpret information from their friends and draw conclude logical and accurate conclusions.

5.4. *Using a Communication Strategy*

Communication strategies initially were used in social science management such as business communication, organizational communication, managerial communication, and other corporate communication. However, in the 21st century, communication skills have been developed into one of the demands that a student or student must

achieve in a lesson (Redhana, 2019; Sugiyarti et al., 2018; Wijaya et al., 2016; Zubaidah, 2017). Communication strategies can produce clear, accurate, and reflective communication when mastering three things, namely communication strategies, communication theory and communication methods. Communication strategies need to be understood for the purpose of decision making, since strategic decisions in communication are part of a retrospective and prospective sensing process. Someone who has accuracy and the decision-making ability to observe the information received and is able to process it perfectly will come up with a superior communication strategy. Moreover, communication strategies are supported by good communication theory and communication methods. In this study, most of the students produced clear, accurate and reactive communication. Therefore, the communication strategy exceeded expectations in a percentage of 86.57.

Communication strategies are also needed to obtain exemplary communication skills (Widiarini, 2019), and to achieve interaction or communication goals (Romadlon, 2016). These skills are not obtained instantly but must be acquired through training (Widiarini, 2019). All students use communication strategies, both consciously and unconsciously when processing new information; Communication strategies are used to transfer ideas and their opinions to others, especially during discussions (Ardianto, 2016). Someone who has a communication strategy will be proficient in speaking (Atma & Nosmalasari, 2016; Romadlon, 2016). Oral communication difficulties are often caused by a person's inability to master communication strategies (Yusparizal, Irawati, & Anugerahwati, 2018).

Communication strategy is closely related to speaking skills and listening skills. Some of the communication strategies used to overcome speech difficulties include: 1) effective social communication strategies; 2) fluency-oriented strategies; 3) strategies oriented to meaning when speaking; 4) accuracy oriented strategies; 5) subtraction and change of words strategies; 6) non-verbal strategies; and 7) using one's own words that do not change the meaning of the information. Other communication strategies for overcoming hearing difficulties include: 1) negotiating meaning while listening; 2) maintains fluency while speaking; 3) scanning; 4) taking meaning and essence; 5) non-verbal strategies while listening; and 6) oriented to his own words (Atma & Nosmalasari, 2016; Permana, Sofyan, & Kasmainsi, 2019).

The learning process with online modified PBL that has been carried out in this study used the right communication strategy. The students used the right communication theory and communication methods according to the topics discussed. They made the right selection of appropriate words, pronounced vowels fluently when speaking so that they were easy to understand, and spoke with an orientation to meaning. This suggests that communication strategy, communication theory and communication methods were treated as one aspect (Panggabean & Wardhono, 2017).

5.5. Communicate Clearly for a Purpose

The main purpose of communication is to exchange information and/ or convey information in order to create shared understanding or change perceptions, even to the point of changing behavior. Someone who has understood the purpose of communication can organize and present information to meet the objectives of the communication. Clear communication skills are needed so that communication objectives can be conveyed as expected and in accordance with the field of science, problems, lecture topics, and learning materials (Martire, 2018).

The communication skills that have been practiced in this study virtually by using Zoom meetings and WAG were found in the satisfactory category with a percentage of 84.57. This means that students are more focused on the material content, while communication objectives are less prioritized. Delivery of material during the discussion was carried out spontaneously, and students did not pay attention to the purpose of communication. This suggests that clear communication skills for this purpose cannot be taught, but can be developed through one's ability to self-reflect and improve, undertake proper training, dedication and hard work.

Students need to develop these skills as provisions for their professionalism after graduating. Communication in delivering a goal is not just conveying ideas, opinions, knowledge orally or in writing (Wisman, 2017). However,

it is necessary to pay attention to the communication method so that it is understood by the communicant and the information conveyed has the same perception between that conveyed by the communicator and that received by the communicant (Suprpto, 2017). Communication methods consist of 1) informative communication, ideas, opinions, knowledge, and information conveyed about new things that were previously unknown; 2) Persuasive communication, a communication process that has the intention of motivating and influencing a person's attitudes, behavior, and views, communication delivered by communicators is expected to change the behavior of the communicant without coercion; and 3) intructive communication, communication that contains an element of coercion, because of the element of fear due to sanctions (Wisman, 2017). The learning process of communication skills in learning should only use the informative communication and persuasive communication methods.

5.6. Presentation Skills

At first, communication skills were only part of the exclusive field of communication. However, in line with the current times, presentation skills became very important and indispensable, particularly in business world and in academic achievement, required in interviews, meetings, conferences, marketing, and like (Dolan, 2018). Effective presentation skills show professionalism, therefore it needs to be handled as a main competence by educational institutions (Wilhalminah & Rahman, 2017). Presentation skills are an essential ingredient of a leader.

Communication criteria, which are called exemplary, include being always ready and appropriately respond to the audience by adjusting the tone of voice, depth, speed and position when presenting. At the time of the presentation, it is necessary to be responsive to the audience, convey information using one's own words that are easy to understand, use the right position on the screen and appear reasonable, without being too flashy (Dolan, 2018; Seau, Azman, & Noor, 2018; Sharif, 2016). In addition, it is also necessary to pay attention to the non-verbal aspects of the presentation such as hand movements and eye contact (Seau et al., 2018; Sharif, 2016).

The ability of students to present virtually using Zoom meetings and WAG in this study exceeded expectations with in a percentage of 85.19. This means that students have mastered presentation skills in the criteria outlined.

Effective presentation skills are needed in 21st-century learning so that students are confident, have courage and the responsibility both to themselves and to society (Sugito, Susilowati, Hartono, & Supartono, 2017). Before making a presentation, it is necessary to prepare carefully, which includes the objectives to be achieved from the presentation, collect adequate material about the topic, get presentation support, and anticipate the expected results from a presentation (Ahmad & Lidadun, 2017; Sharif, 2016). Presentation support can be in the form of media needed during the presentation, including laptop, Liquid Crystal Display (LCD), PowerPoint, the use of videos, photos and so on (Hamdan & Ratnasari, 2016; Sharif, 2016).

A presentation consists of three important components, namely: 1) introduction; 2) content or essence of the presentation; 3) conclusions (Dolan, 2018; Hamdan & Ratnasari, 2016; Sharif, 2016). In the introduction, a presenter is expected to connect the various aspects of the topic for the audience by making use of appropriate words and getting into the core of the topic. The introduction to the presentation is expected to answer four questions for both the speaker and the listener. The speaker may ask (1) why I should make this presentation; (2) why I am interested in studying this topic; whereas the listener may ask: (3) what I will listen to during this presentation; (4) what benefits can I get from this presentation. The content or core of the presentation is presented using clear and regular articulation of words, and an attractive visual presentation so that it is easy to understand, and has the same interpretation of meaning between the presenter and the audience. The conclusion of the presentation is presented with a summary so that there is a common perception between the presenter and the audience and that the purpose of the presentation has been achieved.

After the presentation, a self-evaluation is needed to get feedback and make self-improvement (Indriani, 2020; Sharif, 2016). This self-evaluation can be done by recording using the cellphone camera during the presentation

process. This evaluation can assess the form of voice clarity; selection of appropriate words according to the purpose of the presentation; whether the language used for the presentation was understood by the audience; the style during the presentation including eye contact, body language, politeness; understanding the audience; adapting to the audience; listening actively and responding with precision; and so on. The results of the recordings can be discussed with peers or consulted with the lecturer about possible deficiencies. After knowing the shortcomings, they can be used as a basis for improvement in the next presentation.

Presentation skills are closely related to public speaking skills, in this globalization era graduates are called upon to be proficient and skilled in presentation skills so that they can interact effectively in academic and professional environments (Borisova, Nikitina, Shparberg, Borisov, & Poletaeva, 2019; Sharif, 2016). Presentation skills are a very important factor because it provides significant advantages for job seekers in the labor market (Lucia, Benková, & Daňková, 2017). Teachers around the world use a variety of strategies and technologies in the classroom to equip their students to be independent, challenged, motivated to be organized, creative, using a variety of audio, video, social media, websites, internet communication technologies and so on, as they are encouraged to explore and improve their presentation skills (Ahmad & Lidadun, 2017; Miskam, Aminabibi, & Saidalvi, 2019).

5.7. General Virtual Communication Skills for Online PBL Implementation during COVID-19

Students of the Biology Education study program at the Teaching and Education Faculty of the Islamic University of Jember, who took the Vertebrate Zoology course in the subject of the Reptile class and used the example of *V. salvator* species, generally showed virtual communication skills that 'exceed expectations', with a percentage of 85.16. They have acquired these skills by communicating through learning media with Zoom meetings and WAG during this COVID-19 pandemic.

The Online Problem Based Learning (PBL) model has been modified according to several learning rules during the COVID-19 pandemic (Mcmillan, 2020). PBL is a student-centered approach that empowers students to conduct research, integrate theory and practice, and apply knowledge and skills to produce solutions to determined problems (Surya, Syahputra, & Juniati, 2018). PBL is able to increase courage, self-confidence, and responsibility among students, so that their communication skills can improve (Sugito et al., 2017). In PBL, students are implicitly required to solve problems, which develops their communication skills, without their realizing it, eventually developing their communication skills as well (Listigfiroh & Ellianawati, 2019; Najah, Rohmah, Usratussyarifah, & Susilo, 2019; Nufus & Mursalin, 2020).

Moreover, one of the 21st century demands is to help student acquire communication skills through PBL methods. Due to the pandemic, the learning process required application of virtual communication method. Hence, the modified PBL was adopted and implemented online. There was also a need for all education staff, lecturers, students as well as the entire campus academic community to protect themselves against COVID-19. The problem embedded was to carry out learning from respective homes, with no face-to-face interaction, and only through screen-to-screen computer, laptops or mobile cameras. The learning was to be carried out according to government recommendations to maintain social and physical distancing. This online learning was intended to reduce and even break the chain of COVID-19 (Yuliana, 2020) and therefore learning activity must avoid mass gatherings (Susilo et al., 2020; Yuliana, 2020).

Responding to these problems, the PBL method was ideally chosen in this study. The PBL was found suitable in many subjects both in Indonesia and around the world, in high schools and in universities (Faqiroh, 2020; Lin & Chapman, 2020). In this study, PBL was implemented online using Zoom meetings and WAG. At the presentation and organizing stage, class discussions were carried out using Zoom meetings. All students registered in the course discussed and formulated problems. These problems were further discussed through the WAG by each group to solve problems and overcome gaps that might occur and find appropriate solutions. The lecturer acted as the facilitator in each discussion. The reflection and evaluation stages were presented by each group and discussed in

the class through the Zoom meeting. Apart from cognitive skills, namely mastery of concepts, this learning process also intended to improve other competencies to students, namely communication skills.

PBL is a student centred learning model to make students become independent, creative, and active. It develops their critical thinking, makes them systematic in problem-solving, skilled in communication. However, in this study, since PBL was implemented online through e-learning, it was required to be modified and adapted in its design and syntax. Even so, some of the obstacles faced due to online learning included: 1) students who lived in rural areas often had difficulty getting signals, so that their communication got disconnected several times; 2) it was found that some students who came from underprivileged families had only one cellphone in the family. So, they had to share it with their younger siblings who were also attending online schooling; 3). During the discussion, electricity would suddenly go out or cellphone battery would drop off, resulting in disruption in communication.

6. SIGNIFICANCE OF VIRTUAL COMMUNICATION SKILLS DURING THE COVID-19 PANDEMIC

The COVID-19 outbreak has forced changes and adaptations in various sectors from economy, business to academia, mandating to take up virtual methods for all activities in order to avoid the wider spread of COVID-19. Educational institutions in Indonesia, including Kindergartens, Elementary and Secondary Schools to Higher Education have switched over to online learning methods (Junep & Frenky, 2017; Maydiantoro et al., 2020; Yuliana, 2020). To facilitate online learning needs and maintain optimal education quality, various online seminars, workshops, and training for teachers, education staff, laboratory assistants and lecturers have been held. The Indonesian government has also donated each a student and lecturer a data package of 50 GB every month. This drastic change in offline conventional learning or Blended learning to full online was made possible thanks to the cooperation of all parties, students, families, teachers, stakeholders, government, private sector, the education market, academic institutions, and all user communities. All these individuals and sectors together provided support in multifarious ways including finance, sufficient bandwidth support, right technology for online methods, and smooth reception of online learning (Omar, Jusoh, & Kasuma, 2020; Yuliana, 2020). COVID-19 pandemic has thus changed the world of education into a global world of online education. Apart from the negative side of online learning, it has also forced all elements of education to provide modern, effective and efficient educational living conditions. In addition to education, the COVID-19 pandemic has also affected all sectors of life, so that life skills in the 21st century can be fulfilled including the 4C skills, one of which is communication skills.

7. CONCLUSION AND IMPLICATIONS

During the COVID-19 pandemic, one of the calls to avoid was to practice social and physical distancing, and the learning that was originally carried out face-to-face in a classroom was suddenly changed into online learning. In online or virtual learning, all students and teachers interacted from their respective residences. This study showed how virtual communication using Zoom meetings and WAG can be used as a solution in helping students achieve communication skills, even if it is not face to face. The PBL implementation can teach students how to understand speaker's expression over a screen from the tone of his voice, the eye gaze, and the facial expressions which sufficiently convey the intent and purpose of communication.

The combination of Zoom meeting and WAG can also be used as an alternative to learning with a modified PBL model. It can be used to virtually assess students' communication skills. In Zoom meetings and WAG, when students face each other over the screen, their facial expressions and mimics can be seen by the interlocutor. Such a virtual communication can be recommended as a learning technique. However, there are some questions that arise: Is online learning and virtual communication effective and can be done for all courses? Will online learning continue or shall be practiced only during the COVID-19 pandemic? Further research is needed regarding communication skills in a virtual learning environment.

Funding: Authors would like to thank RISTEKDIKTI for the fund given for the conduct of this research.

Competing Interests: The authors declare that they have no competing interests.

Acknowledgement: Thank you very much to 'Dr. H. Abdul Hadi, S.Pd., MM.,' the Chancellor of the Islamic University of Jember, 'Mr. Arifin Nur Budiono, S, Pd., M.Si.,' Dean of the Faculty of Teacher Training and Education, 'Mrs. Diah Sudiarti, M. Si.,' as the Head of the Study Program, 'Mr. Imam Bukhori Muslim, M.Pd.,' the lecturer of Vertebrate Zoology Course who has given permission to conduct research. Authors also offer thanks to 'Mr. Fatih Al Fauzi, M.Pd.,' who helped in the Zoom meeting process, and 'Khusnul Waidasari', and 'Raden Ibrahim Tirto Agung Gumelar,' who helped during the data collection process.

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