USEJ 7 (3) (2018)

Unnes Science Education Journal

http://journal.unnes.ac.id/sju/index.php/usej

DEVELOPING SCIENCE WINNING TRACK GAMES MEDIA TO IDENTIFY COMMUNICATION SKILLS OF PARTICIPANTS IN ECOSYSTEM TOPIC

Litasari Aldila Aribowo[1], Sigit Saptono[2], Indah Urwatin Wusqo[3,✉]

[1]Student of Integrated Science Department, Faculty of Mathematics and Natural Sciences, 50229, Universitas Negeri Semarang, Indonesia
[2]Lecturer of Biology Department, Faculty of Mathematics and Natural Sciences, 50229, Universitas Negeri Semarang, Indonesia
[3]Lecturer of Integrated Science Department, Faculty of Mathematics and Natural Sciences, 50229, Universitas Negeri Semarang, Indonesia

Info Artikel

Article History:
Received April 2018
Accepted July 2018
Published December 2018

Keywords:
Science media, ecosystem topic, communication skills

Abstract

The purpose of this research was to develop the science of winning track games that can accommodate communication skills. This research is development research using Borg, Gall and Gall research model which quoted from Sugiyono (2013), that there are ten steps in the implementation of research and development strategy. The study sample was purposive, they were students of SMP Negeri 3 Semarang. In a small-scale trial, 16 students were drawn from class VIII, and large-scale trials were conducted in class VII E. Data collection methods used were interviews, questionnaires, observation. The final data analysis includes media and material feasibility analysis, readability analysis of teachers and learners, and communication skills analysis. The conclusion are (1) Science winning track games is a media successfully developed and declared feasible (2) Science winning track games media is effective to identify communication skill of student. It proof by increasing the average score of the students from 66.67% in the first meeting to 100% in the third meeting.

p-ISSN 2252-6617
e-ISSN 2252-6232

✉Correspondence author:
Indah Urwatin Wusqo
Integrated Science Department
Gedung D5 Lantai 1 Kampus Sekaran, Gunungpati Semarang 50229
Email: urwatin@mail.unnes.ac.id

INTRODUCTION

Law Number 20 Year 2003 on the National Education System states that what is meant by education is a conscious and planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have spiritual power of religion, self-control, personality, intelligence, noble character, as well as the necessary skills of himself, society, nation, and state. UU no. 20 The year 2003 can be realized with the existence of a planned business related to the learning program and facilities and infrastructure that support the learning process. The curriculum is now developed through a student-centered learning approach, in accordance with the learning paradigm of the 21st century which emphasizes to learners to have thinking and learning skills which include problem-solving skills, critical thinking, Collaboration, and communication skills. Rotherdam & Willingham (2009) notes that the success of a learner depends on 21st-century skills, so learners must learn to have it.

According to Roger and Kincaid (in Cangara, 2014), communication is a process whereby two or more persons form or exchange information with each other, which in turn will arrive at deep mutual understanding. Rifa'i & Anni (2012), states the learning process is a communication process between educators and learners, or between learners. Parts of communication include the person sending the information, the information and feedback by the receiver, and the repetition of these processes creates knowledge development (Iksan et al 2012). According to Mohammadi (2010), Lack of communication skills will create problems involving many people. Communication skills can be observed when students engage in group discussions as well as during communication between learners and teachers (Utami, 2014). Based on the limited study when the group discussion at SMP N 3 Semarang, it was found that seven students (20%) had high communication skills, as many as 11 students (32%) had medium communication skill and the rest were 16 students (48%) Have low communication skills. When discussing in a group, there are only 1-2 students who are actively communicating. Based on the description shows there are still learners who have low communicating skills that are characterized by not daring to express opinions in public, speaking with indecisive and unclear, the use of language that is convoluted and ambiguous, and difficult to understand. Based on the limited study shows that there is an effort to optimize the potential communication skills of learners so that Indonesian students can compete with other countries.

According to Hidayati (2012), learners should be given the opportunity to exploit themselves in learning to have a good learning experience and teachers need to provide learning media that stimulate the curiosity of learners and make learners active in learning. Teachers play a role as a determinant in planting the concept to learners, so that the mastery of teachers to the subject matter and ability in selecting and using models, learning techniques and set the learning media is crucial to the success of the learning process in addition to the potential and ability of learners (Rohwati, 2012). Fun and meaningful learning can be created by teachers using the surrounding media. The use of media can create an effective, creative and enjoyable learning environment for learners (Wasilah, 2012). In the field of education, frequently the term tool or media for communication is used interchangeably or as a substitute term for educational media (learning). The use of tools in the form of this media gives hope of increasing the communication so the learning process can run smoothly and with maximum results (Taufiq et al, 2014). Learning media is a tool used by teachers to deliver learning materials to learners. Learning media can be graphic media, audio media, silent projection media, and game media. The function of learning media such as a tool to make learning more effective, accelerate the learning process, improve the quality of teaching and learning process, and make the abstract thing concrete so that it can reduce the occurrence of verbalism disease (Nurseto, 2011).

Within the process of using media, teachers can do a variety of activities. One of them is through the game. As Kovačević and Opić (2014) have asserted, the activity of playing

gives children the possibility of active participation and opportunities for growth, and help them achieve better confidence and relationships within the group. At younger school age, the game has significance for child development and can be easily integrated into the teaching process. Playing games is very effective in developing students' communicative abilities especially the dynamic communication process in which students as creatures think, express emotionally, act as communicators not only as a place of knowledge, try to get their ideas, concepts, thoughts, emotions and feelings expressed, based on experience in their own lives (Zhu, 2012). In addition, Dewi et al. (2016) revealed that the use of communicative games in the learning process improves students' achievement and communication skills. Students enjoy learning and gain more motivation, interest, and confidence through learning. Therefore, communicative games should be applied as activities designed in the learning process to practice communication skills. Chik (2016) also reveals that student communication increment is more developed when communication between peer learning occurs (students have a question and answer with other students) than when students answer teacher questions.

However, not all learning materials are suitable for learning using games. Haya et al. (2014) mentioned that the suitable material used in the card is that having a contextual image and is often found in everyday life. The ecosystem material in the revision syllabus of 2013 curriculum is available in basic competency number 3.7, that is analyzing the interaction between living creatures and their environment. Based on the basic competency, it is necessary learning field exploration and use of media for understanding the concepts of ecosystems. Science winning track games are applied to the ecosystem material because the ecosystem is related to daily life, with the media being able to identify the communication skills through the exploration activities of learners' knowledge. Media science winning track games aims to know the communication skills of learners through group discussion and the delivery of answers in turn. Application of learning with science media winning track games can make learners more confident again in the learning process. Research conducted by Chung et al. (2014) states that learning by examining social issues of society can improve the skills of children in communicating.

Based on the above explanation it is stated that media learning should also be developed on ecosystem material. Media used must be interesting media and in accordance with the characteristics of learners so that it can motivate to learn. Media science winning track games is an educational game of learners which is a fusion of game media snake ladder and card. Media science winning track games are equipped with two kinds of cards: surprise card and special card. Surprise card consists of 3 card categories namely zonk card, question card, and gift card. Surprise card is taken by the player when the pawn is on the plot of the number, while the special card is taken by the player when the pawn is in the plot where the stairs go up. Special cards contain problems that have a higher difficulty level than surprise cards. Problems contained in the special card is problem-solving if the group can answer the problem-solving the problem, then the pawn can follow the direction of the rising ladder. Card games enhance the communicative ability and encourage active learning through interaction with other players (Bochennek et al., 2007).

The purpose of this research was to develop the science of winning track games that can accommodate communication skills. Questions for this research are as follows: (1) how to develop valid science winning track games? (2) Is science winning track games effective to improve the communication skills of junior high school students on science learning on ecosystem material? This article contributes to the development of science learning by enhancing communication skills in science learning process through the development of science winning track games media. Science winning track games of this media is different from playing another snake ladder because the snake ladder board is made big so that it can be used by students of one class and useful in practicing communication skills in science learning.

METHODS

Research design

This research is development research using Borg, Gall and Gall research model which quoted from Sugiyono (2013), that there are ten steps in the implementation of research and development strategy.

Procedure

The steps of product research and development are described as follows: (1) Potentials and Problems. This stage includes an interview with students and teachers of science subjects in SMP Negeri 3 Semarang and doing observation activities; (2) Data collection. This stage includes the collection of preliminary observation data, books related to ecosystem material, materials for expert validation sheet, readability questionnaire, and observation sheet (3) Design of science media products winning track games. This stage includes design creation with X6 Corel draw suite, color theme selection, game hints, ecosystem related drawings, problem card design, concept comprehension and problem-solving problems. (4) Design validation. This stage includes the validation of media experts and material experts two times assessment. (5) Media design revision. This stage includes product refinements as per validator suggestions. (6) Small-scale trials. This stage includes the use of media on a small scale and the distribution of questionnaire legibility to 16 students. (7) Revision of trial results. This stage includes product refinement based on the result of a questionnaire of legibility. (8) Large-scale trials. This stage includes a test of 36 students to identify communication skills. (9) Product revisions. This stage includes product improvements based on a legibility questionnaire on large-scale trials. (10) Final media science is winning track games. This stage is obtained by media that is suitable for use in learning.

Sample

The study sample was purposive, determined without stratification; samples were selected based on specific goals (Arikunto, 2013). The subjects of this study were students of SMP Negeri 3 Semarang. In a small-scale trial, 16 students were drawn from class VIII, and large-scale trials were conducted in class VII E.

Instrument

Data collection methods used were interviews, questionnaires, observation. The questionnaire used in the research of science media development winning track games is the expert team validation sheet for media and material feasibility, the questionnaire of students' responses about the use of science media winning track games. The observation sheet is used to measure communication skills. Indicators used to measure students' communication skills in the questionnaires include: (1) conveying opinions, (2) answering questions, (3) performing good language use, (4) producing short talk, clear sound and the talk should be easy to understand.

Data Analysis

Methods of data analysis in this study include analysis of final data. The final data analysis includes media and material feasibility analysis, readability analysis of teachers and learners, and communication skills analysis. The analytical formula of those final data as follows:

$$P = \frac{f}{N} \text{x } 100\ \%$$

Information :

P = percentage (mastery of learning outcomes learners in class)

F = number of scores obtained

N = maximum number of scores

(Sudijono, 2009)

The final scores of media and material feasibility analysis, readability analysis of teachers and learners, and communication skills analysis were interpreted using the classifications of categories by Sudijono (2009) where an average between = 25.00% and 43.75% is considered not good, an average between 43.75% and 62, 50% is considered moderate, an average between 62, 50% and 81.50% considered good and lastly an average between 81.50% and 100.00% considered very good.

RESULTS AND DISCUSSION

Science media development research was winning track games validated by experts to determine the feasibility of the media. Media feasibility is viewed in terms of media and materials. The assessment of the feasibility of media science winning track games is done twice. Assessment by media experts can be said worthy of use if media feasibility score> 62.50% and there is no revision. The results of the assessment by media experts can be seen in Table 1.

Table 1. Feasibility Test Results of Media Science Winning Track Games by Media Experts

Validator	Institution	Percentage (%) Validation I	Validation II
Validator 1	Lecturer of Science Education, Unnes	81.25 (Very Good)	97.92 (Very Good)
Validator 2	Lecturer of Science Education, Unnes	68.75 (Good)	97.92 (Good)
Validator 3	Science Teacher of SMP N 3 Semarang	83.33 (Very Good)	100 (Very Good)
Average		77.78 (Good)	98.61 (Very Good)

Based on the results of feasibility analysis of media experts presented in Table 1 shows that the average of the first stage of validation is 77.78%. The value indicates that the media science winning track games have been declared very feasible with some revisions, then submitted the second stage validation obtained an average of 98.61% and stated very feasible. The percentage of validation increases due to improvements to the deficiencies and weaknesses of a product, in addition to improvements made by researchers to produce new products (Istianah et al., 2012).

The second assessment is the validation of science media winning track games by material experts presented in Table 2.

Table 2. The second assessment is the validation of science media winning track games by material experts

Validator	Institution	Percentage (%) Validation I	Validation II
Validator 1	Lecturer of Science Education, Unnes	72.50 (Good)	100 (Very Good)
Validator 2	Lecturer of Science Education, Unnes	97.50 (Very Good)	100 (Very Good)
Validator 3	Teacher of SMP N 3 Semarang	80.00 (Good)	100 (Very Good)
Average		83.33 (Very Good)	100 (Very Good)

The results of this study indicate that the assessment of science media winning track games by material experts in the first phase validation obtained an average of 83.33% percentage and categorized very decent. Improvement is done based on the suggestion and input from the expert, then performed the second stage validation is obtained the average percentage of 100% categorized media is very feasible to use.

Figure 1. Final product of science winning track games media

Figure 2. Final product of question card

Figure 3. Final product of special card

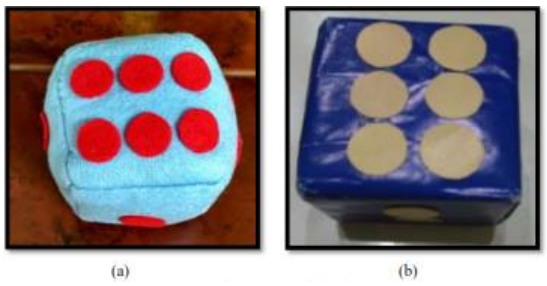

Figure 4. Final Product of dice

The feasibility of media science winning track games is not only judged from the media and material feasibility by experts but also based on questionnaire legibility of learners. This is because the response from learners can provide suggestions or comments to improve the media for science media winning track games can be used in science learning in SMP class VII. The response of learners there is two responses that are with the response of learners at the time of small-scale test and the response of learners at the time of the large-scale test. Recapitulation of legibility questionnaire can be seen in Table 3.

Table 3. Recapitulation of Student Legality Questionnaire

Treatment	Number of Students	Average of Percentage	Criteria
Small Scale Trial	8	83.65%	Very Good
Big Scale Trial	32	95.28%	Very Good

The average percentage of learners' responses from small-scale trials to large-scale trials is a percentage increase from 83.65% to 95.28%. The increase was 11.63%. Comparisons between averages on small-scale trials with large-scale trials do not occur because in large-scale trials there are no suggestions for improving science winning track games and ratings are included in the excellent category. The results obtained are the same as the research conducted by Vikagustanti, et al. (2014) states that there is an increase in a small-scale test with a large-scale trial that is from the scale of 85.75% to 90.55% which states that the media developed very good.

The small-scale trial used class VIII as many as 16 students to try to use science media winning track games. These trials have suggestions and comments to refine the media that has been developed. Then a large-scale trial was conducted in class VII E, and there were no commentary responses of learners on large-scale trials.

Media science winning track games are still lacking in the use of this medium takes a long time in the game despite the limited time of the game, takes a long time to set the position of table and chair players and group members. The result of communication skill observation can be seen in Table 4.

Developing Science Winning Track Games Media

Media of science winning track games are developed to help learners experience learning difficulties about ecosystem materials. These media include a set of components, i.e., there are media boards containing images on small plots, numbered plots and question cards. Question card there are two kinds of surprise card and special card. Surprise card contains three different card parts: question card, zonk card, and gift card. Question cards contain conceptual comprehension questions. Zonk card contains the command to back off one plot, two plots and so on. Gift card contains advantages for free questions, advance one plot, advance two plots and so on. Special card type contains problem-solving in everyday life. Learning in this media using Problem Based Learning model. Researcher Afrizon (2012) states that PBL is defined as learning that begins with the presentation of an authentic and meaningful problem to learners so that learners can conduct investigations and find solutions to their problems. The special card contains the problem-solving questions; the questions will be read by the players and then discussed by the

group. The card about the special card that contains the question is made as a problem-solving in groups that must be sought solution. Learning using this medium can make learners can obtain information or experience directly. In the process of solving problems together here will make students practice communicate well.

Table 4. Percentage of Number of Students to Communication Skills Based on Score

Scores based on Rubric	Percentage of Number of Learners at each Meeting by Indicator:											
	Indicator 1 Expressing Opinion			Indicator 2 Answering Questions			Indicator 3 Using Good Language			Indicator 4 Short Speech, Clear and Understandable		
	Meeting			Meeting			Meeting			Meeting		
	I	II	III	I	II	III	I	II	III	I	II	III
1	47.22	11.11	0.00	30.56	2.78	0.00	47.22	16.67	0.00	50.00	30.56	0.00
2	52.78	69.44	13.89	47.22	61.11	27.78	50.00	63.89	25.00	47.22	55.56	30.56
3	0.00	19.44	86.11	22.22	36.11	72.22	2.78	19.44	75.00	2.78	13.89	69.44

Science winning track media was first validated by experts associated with the developed media. There are two experts who validate the media science winning track games namely media experts and material experts. Validators or experts who assess the media and material aspects consist of three validators of each aspect. Every aspect has three experts to get a valid and significant value because each validator has different judgments. The purpose of the validation of science media winning track games developed is to know that the media developed feasible use as a medium of learning aids at school or not. Media validation contains suggestions and comments that can help the researcher to improve the media developed for use as a medium of learning. Media science was winning track games that have been developed through the validation stage as much as two times until the science winning track games worthy of use.

The assessment of science media winning track games by media experts is done in 2 stages with three validators. Validator one and two are lecturers of Science Faculty of Mathematics and Natural Sciences Unnes and validator three is science teacher from SMP Negeri 3 Semarang. Media science winning track games developed in stage 1 by media experts obtained very feasible results with the average percentage 77.78% by the three validators. Science media development winning track games are said to be feasible if media feasibility score > 62.50%. The results of the validation of science media winning track games by the complete media experts are presented in Table 1. In the first stage of assessment by media experts, there are some suggestions and comments used to improve the science media winning track games.

In the assessment stage 1 by the media expert, there are six suggestions to improve the media science winning track games to be worthy of use. The revision of the development of science media winning track games by the media experts are (1) The color theme between the board and the card are mixed, (2) The type and size of the font are equated (at least 3 font types) (3) Repair the typo errors (4) foreign terms must be italic (5) Repair the number of points on the problem (6) Repair the line spacing on the way of the game (7) fix or discard the ambiguous sentence or sentence that can show the answer expressly.

After revising based on the suggestions and comments from media experts, then the assessment of media aspects in phase 2 is carried out. Assessment in stage 2 is the result of media improvement based on the assessment in stage 1. The second stage of assessment obtained the average percentage 98.61% of the three validators with the criteria very feasible. The only suggestion is that media science winning

track games can already be used for product trials. Based on the result of media feasibility calculation with mean validation percentage which is up to 62,50% then the product is declared eligible to be used. The results of the 2nd stage review by the media expert can be seen in Table 3. The feasibility of media science winning track games has increased from 77.78% to 98.61% with the very good category. The development research conducted by Vikagustanti (2014) shows the feasibility of IPA monopoly media to obtain media feasibility of 84.09% with criteria very feasible and can be used as a source of learning science fun.

Media science winning track games are not only judged from the media aspect but are also judged from the material aspect. In the media assessment by material experts, there are also three validators, namely first and second validator are a lecturer IPA FMIPA Unnes and the third validator is science teacher of SMP Negeri 3 Semarang. The assessment of science media winning track games by material experts is also done two stages until it can be used for product testing in the learning process. The assessment of science media winning track games by the material experts in stage one obtained the average percentage of 83.33% with very reasonable criteria. The results of the assessment of phase 1 by the material experts can be seen in Table 2.

In the media assessment at stage 1, there are still suggestions or comments to be improved. Suggestions or comments to be corrected include (1) Fixing misconception problems and answers. Examples of variations of questions are such as "A few days ago Intan examined a problem of the mass death of snails on the beach near her home. The science used to investigate the above case is Ecology. "The problem causes misconceptions because the science that studies the issue of mass death is parasitology. After being revised, the question was replaced with "A few days ago Intan examined an abundance of the bird population in Cibubur. The science used to investigate the above case is ... Ecology "(2) fixing the question/question is ambiguous or misleading the concept. Examples of questions before the revision "On the symbiosis that occurs between plants and bees, plants benefit in the form of ..." after the revised question is replaced with "On the symbiosis that occurs between flowering plants and bees, flowering plants benefit in the form of ..." (3) improve the writing of scientific names which is not in accordance with the rules of writing, as well as "In the aquatic ecosystems, there are many Rhodophyta (red algae) which acts as ..." to "In the aquatic ecosystems, there are many Rhodophyta (red algae) which acts as ..." and (4) a typo on a blue surprise card, like the word "abiotik" which should be the word "abiotic"; the word "orgainsme" should be the word "organism"; the word "tali puri" should be the word "tali putri".

Media science is winning track games that have been improved based on suggestions from validators at stage one, then assessed again on the assessment by material experts at stage 2. Assessment in stage 2 obtained a percentage of 100% which belongs to a very good category. In the second stage of assessment, the only suggestion is that the media can already be used for testing. The results of the average assessment of science media of winning track games by the material experts can be seen in Table 2. In the media assessment by the material experts, there is an increase from the percentage 83.33% to 100% with criteria very suitable for use in learning. This is also in accordance with research conducted by Vikagustanti et al., which states that IPA monopoly media is feasible to be used in science lesson of SMP class VII with an average percentage of 89.58%. The assessment of material experts also has the same criteria as the media expert. If the percentage is more than 62.50%, it can be said that it is worthy to use. A set of media science winning track games that have been declared eligible can be seen in Figures 1, 2, 3 and 4.

The feasibility of media science winning track games is not only judged by media and material feasibility by experts but also based on questionnaire legibility of learners. This is because the responses from learners can provide suggestions or comments to improve the media so that the science of science winning track games can be used in science learning in SMP class VII. The response of learners contains responses that are with the response of learners at the time of small-scale test and the response of

learners at the time of the large-scale test. The small-scale trials obtained a mean score of 83.65%; this score indicates that the media of science winning track games are included in the criteria of very feasible. The average results of the students' responses on small-scale trials can be seen in Table 3. The small-scale trial used class VIII as many as 16 students to try to use science winning track games. These trials have suggestions and comments to refine the media that has been developed. Suggestions and constructive comments are just like fixing the original dice in the form of a doll replaced with a dice made from cardboard (Figure 4). Fixing the game rules of the science winning track games that initially any pawn that stops drawing, then the player gives a clue to his group and the group members explain the clue meaning of the player. The rule is added with the rules if there is a pawn that stops on the image and can explain correctly, then if there is another pawn that stops in the drawing plot, then the player no longer gives a clue around the picture, but take a surprise card.

Suggestions and comments from small-scale learners' responses are used to improve science winning track games to be used in learning to be tested again on a large or broad scale. Large-scale trials were conducted to determine the response of learners about the media that has been developed. Students' responses to large-scale trials received responses of 95.28% with very reasonable criteria. The results of large-scale test responses can be seen in Table 3. In large-scale trials, there is no meaningful suggestion, but there are comments stating that learners enjoy learning to use science winning track games. The average percentage of learners' responses from small-scale trials to large-scale trials is a percentage increase from 83.65% to 95.28%. The increase was 11.63%. Comparisons between averages on small-scale trials with large-scale trials do not occur because in large-scale trials there are no suggestions for improving science winning track games and ratings are included in the excellent category. Umar et al.'s (2016) study suggest that students have a higher interest in learning with science-based smart card edutainment.

The results obtained are the same as the research conducted by Vikagustanti et al (2014) which stated that there is an increase in a small-scale trial with the large-scale trial from the scale of 85.75% to 90.55%. It means that the media developed is very good. The large-scale trials are conducted in the same class VII E with the learning in accordance with the Learning Implementation Plan (RPP). Sampling to be used for large-scale trials used purposive sampling by taking samples on a particular destination (Sukardi, 2003). Class VII population in SMP Negeri 3 Semarang have eight classes that are class VII A-VII H. The sample used in the large-scale trial is class VII E by the suggestion from a teacher of science subjects in SMP N 3 Semarang.

The Effectiveness of Using Media Science Winning Track Games on Communication Skills

Communication comes from the Latin *Communis* meaning to make togetherness or build togetherness between two or more people. Communication also comes from the Latin root of *Communico* which means to divide (Stuard in Cangara, 2014). The improper learning process can cause learning outcomes, and learning achievement of learners become less. The results of Noviyanti (2011), stated that communication skills affect the learning presentation of 89%. The study shows that communication skills have a high effect on learning achievement because communication is part of the learning process itself. Research by Levy et al. (2009) that scientific communication skills affect science learning (IPA).

The result of communication skill analysis of students in this research is obtained by using observation sheet in every meeting in science learning process using science media winning track games. Media Science Winning Track Games are played by students in groups; teachers act as facilitators to confirm learners' answers and motivate other groups to communicate answers correctly. This is in accordance with the results of Marchetti et al. (2015) research related to TCG (Trade Card Games) made to realize the knowledge and understanding gained about the subject and used in several ways: played by the students then allowing reflection and criticism together with

the teacher, Or by other children enabling the possibility of communicating different understandings of the subject and Encouraging critical reflection on an alternative viewpoint. In this case, such card games serve as a means of intermediary for pleasant communication about the subject (Rogoff, 1990). Improving the communication skills of learners can be known by looking at the average percentage of each meeting.

Learners communicate with their fellow group members in preparing pawn player representatives. Discussions dividing tasks for game preparation indicate that learners are beginning to communicate skillfully. The player reads the acquisition of the card or gives a clue when getting the picture in the game also shows the communication skills of the player. When group members discuss the answers to the questions being read by players, indicate the participation of each learner to express his or her opinion. The criteria of assessment indicator convey the opinions of the learners is firm and correct. Students who can express their opinions firmly and correctly in the group, then learners earn point 3. The results of observation indicators convey opinions at the first meeting there are many learners who get 1 point from the observer that is equal to 47.22% of learners. This is because there are still many students who are less actively discussing in groups because in the stage of adjustment with the new media applied. Learners tend to be afraid to express opinions to their friends. At the second meeting, the percentage of the number of learners who earned point 1 decreased to 11.11%. These results indicate that there is an increase in the skills to convey opinions to learners in the second meeting because of the decrease in the number of learners who get a score of 1. Learners can adjust to the second meeting with the media science winning track games. At the third meeting, there were no students who got a score of 1, thus indicating that with the use of science media winning track games motivate learners to keep active in learning, especially regarding expressing opinions. The results are corroborated by Darmawan et al. (2013) study, where the tasks or questions given to the group can improve students' oral communication during group discussions.

Each member of the group is required to answer in turn, so that can know the communication skills of each learner to answer questions. The assessment criteria indicator to answer questions from learners is the true and clear answer. Learners who can answer the questions correctly and, both regarding sound or pronunciation, the learners earn point 3. The results of the observer's assessment at the first meeting there are 30.56% of learners who earned 1 point, so there are still many students who Answer the question wrongly. At the first meeting the learner is not ready for the game to be done, so they have not studied the material first at home even in the learning has been done discussion activities. At the second meeting, there were only 2.78% of students who answered incorrectly, while at the third meeting there were no students who often answered wrong. It shows that there is an increase in the ability of learners to answer questions correctly because they are motivated to prepare themselves by learning the material first when at home.

The third indicator of communication skills is the use of good language. The criteria for good language use is the standard, unambiguous and non-convoluted language. At the first meeting, there were 47.22% of learners who scored one because of using nonstandard language, convoluted and ambiguous in communicating. While at the second meeting there was a decrease to 16.67% of students who still have poor language skills. This is because the students carried the language habit when communicating in everyday life is by using non-standard language. However, at the third meeting, the language skills of learners have become better because in previous meetings teachers always remind students to use a standard language, not ambiguous and not convoluted.

The fourth indicator of communication skills is short and easy to understand conversations. The criteria of the indicator are clear, fluent, and easy to understand. The first meeting of 50% of learners did not meet the criteria, so get a score of 1. This is because of feelings of shame in the students if wrong to speak in front of his friends, thus making himself

speak slowly, the voice is not clear, And difficult to understand. The second meeting of the number of learners who did not meet the criteria of short and easy to understand speech indicator decreased to 30.56% of the students. Teacher as a facilitator always motivates learners in playing using media science winning track games for confident in speaking convey the answer with a brief, clear and easy to understand. At the third meeting, there has been a good improvement with the fulfillment of 1 of 3 short discussion criteria and easy to understand so that learners at least get a score of 2. Media science winning track games are said to be effective in identifying the communication skills of learners if the research results have exceeded 66.67 %. The following Figure 4.1 shows the percentage of the number of learners who have a communication skill score of more than 66.67% at each meeting.

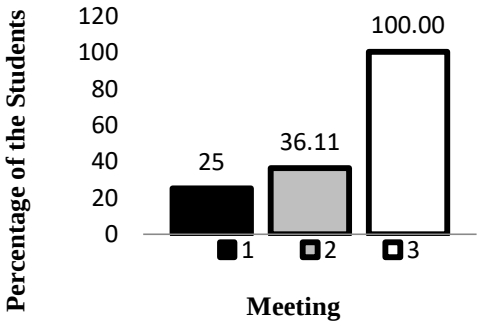

Figure 5. Communication skill

The graph shown in Figure 5 shows that the number of learners who got a communication skill score of more than 66.67% during three observation observations was increased. The communication skills of learners according to Kunandar Criteria (2013) are always in a good category if the score is always above 66.67%. Based on the observer observation at the first meeting, as much as 25% of learners got an average score of more than 66.67%, second meeting as much as 36.11% and third meeting as much as 100%. It shows an increase in the number of learners who have a good average and very good at each meeting. Communication skills at the first meeting with the second meeting increased the number of students who have good and excellent criteria of 11.11%, while in the second meeting with the third meeting there was an increase of 63.89%. The increase in numbers indicates that science winning track games are effective against the communication skills of learners. The use of science winning track games at the first meeting motivates learners to more actively communicating express opinions in the form of answering questions from the question card on the use of science winning track games at the next meeting.

Science game-winning track games can cause learners to have more concentrated and enthusiastic attention so that communication runs more effectively in learning. The results are in line with Chasanah et al. (2015) which mentions the game media can make learning more conducive and fun.

Science media of winning track games still have lackness. Using this medium takes a long time in the game although the time has been limited. It also takes a long time to set the position of table and chair players and group members. Suggestions for the use of science medium winning track games on the long-term stated that this media should be used within two hours of the intact lesson so that before the learning with the media begins, the teacher can prepare the table and chair along with the learners. Addition of time can allow pawn till the last plot (finish).

CONCLUSION

Science winning track games is a media successfully developed and declared feasible. Science winning track games media is effective to identify communication skill of student. It proof by increasing the average score of the students from 66.67% in the first meeting to 100% in the third meeting.

REFERENCES

Afrizon, R., Ratnawulan & A. Fauzi. (2012). Peningkatan perilaku berkarakter dan keterampilan berpikir kritis peserta didik kelas ix MTs model padang pada mata pelajaran ipa-fisika menggunakan model problem based instruction. *Jurnal Penelitian Pembelajaran Fisika, 1(1), 1-16.*

Bochennek, K., Wittekindt, B., Zimmermann, S. Y., & Klingebiel, T. (2007). More than mere games: a review of card and board games for medical education. *Medical teacher, 29*(9-10), 941-948.

Cangara, H. (2014). *Pengantar Ilmu Komunikasi*. Jakarta: PT Raja Grafindo Persada.

Chasanah, R. & Dewi, N. R. (2015). Pengembangan *Sciencepoly Game* Berbasis Kontekstual sebagai Media *Science-Edutainment* Pata Materi Kalor dan Perpindahanya untuk Siswakelas VII SMP. *Unnes Science Education Journal*, 4(2).

Chik, N. A. (2016). Action Research: Student's Communication Skill through Peer Learning Method-(Regional Development-GMJT3124) Group B. *Journal of Education & Social Policy, 3(6):36-44*

Chung, Y., Yoo, J., Kim, S. W., Lee, H., & Zeidler, D. L. (2016). Enhancing Students' Communication Skills In The Science Classroom Through Socioscientific Issues. *International Journal of Science and Mathematics Education*, 14: 1-27.

Nurkhasanah, L., Mulyani, B., & Utomo, S. B. (2013). Efektivitas Pembelajaran Kooperatif tipe Two Stay Two Stray (TSTS) dan Think Pair Square (TPSq) Melalui Pemanfaatan Peta Konsep Terhadap Prestasi Belajar Siswa pada pokok Bahasan Sistem Koloid Kelas XI SMA N 4 Magelang Tahun Ajaran 2011/2012. *Jurnal Pendidikan Kimia*, *2*(2), 24-30.

Dewi, R. S., Kultsum, U., & Armadi, A. (2016). Using Communicative Games in Improving Students' Speaking Skills. *English Language Teaching*, 10(1), 63-71

Haya, F. D., Waskito, S., & Fauzi, A. (2014). Pengembangan Media Pembelajaran Gasik (Game Fisika Asik) untuk Siswa Kelas VIII Sekolah Menengah Pertama. *Jurnal Pendidikan Fisika*, 2(1), 11-14.

Hidayati, N., & A. I. Wuryandari. (2012). Media design for learning indonesian in junior high school level. *Procedia Social and Behavioral Sciences*, 67, 490 – 499.

Iksan, Z. H., Zakaria, E., Meerah, T. S. M., Osman, K., Lian, D. K. C., Mahmud, S. N. D., & Krish, P. (2012). Communication skills among university students. *Procedia-Social and Behavioral Sciences*, *59*, 71-76.

Istianah, I., Widodo, J., & Prasetya, E. (2012). Pengembangan Bahan Ajar dengan Pendekatan Metakognisi Pada Materi Permintaan dan Penawaran Kelas X SMA Negeri 3 Demak. *Journal of Educational Social Studies*, *1*(1).

Kovačević, T., & Opić, S. (2014). Contribution of Traditional Games to the Quality of Students' Relations and Frequency of Students' Socialization in Primary Education. *Hrvatski časopis za odgoj i obrazovanje*, 16(Sp. Ed. 1), 95-112.

Kunandar. (2013). *Penelitian Autentik: Penilaian Hasil Belajar Peserta Didik Berdasarkan Kurikulum 2013*. Jakarta: Rajawali Pers.

Spektor-Levy, O., Eylon, B. S., & Scherz, Z. (2009). Teaching scientific communication skills in science studies: Does it make a difference?. *International journal of science and mathematics education*, *7*(5), 875-903.

Marchetti, E., & Valente, A. (2015). Learning via Game Design: From Digital to Card Games and Back Again. *Electronic Journal of E-learning*, *13* (3), 167-180.

Mohammadi, M., M. Esmaeily., & A. Nik. (2010). The effectiveness of group consultation in the method of transactional analysis over the student's communicative skills. *Procedia Social and Behavioral Sciences,* 5, 1490–1492.

Nurseto, T. (2011). Membuat Media Pembelajaran Yang Menarik. *Jurnal Ekonomi & Pendidikan*, 8 (1), 19-35

Rifa'i, A & T. C. Anni. (2012). *Psikologi Pendidikan.* Semarang: Pusat Pengembangan MKU-MKDK LP3 Unnes.

Rogoff, B. (1990). Apprenticeship in Thinking. Cognitive Development in Social Context, Oxford University Press, New York, USA, Oxford UK.

Rohwati, M. 2012. Penggunaan *Education Game* Untuk Meningkatkan Hasil Belajar Ipa Biologi Konsep Klasifikasi Makhluk

Hidup. *Jurnal Pendidikan IPA Indonesia,* 1 (1), 75-81.

Rotherdam, A. J., & D. T. Willingham. (2009). 21st Century Skills: the challenges ahead. *Educational Leadership* Volume 67 Number 1 , 16 – 21.

Sudijono, A. (2009). *Pengantar Statistik Pendidikan*. Jakarta : Rajawali Pers.

Sugiyono. (2013). *Metode Penelitian Pendidikan*. Bandung : Alfabeta.

Sukardi, S. (2015). Metodologi Penelitian Pendidikan Kompetensi dan Praktiknya. Yogyakarta: Bumi Aksara.

Taufiq, M., N.R. Dewi, & A. Widyatmoko. (2014). Pengembangan Media Pembelajaran IPA Terpadu Berkarakter Peduli Lingkungan Tema "Konservasi" Berpendekatan Science-Edutainment. *Jurnal Pendidikan IPA Indonesia*, 3(2), 140-145.

Umar, N. H. M., Parmin, P., & Wusqo, I. U. (2017). Pengaruh Media Kartu Pintar Tumbuhan Berbasis Science Edutainment Terhadap Minat Belajar dan Pemahaman Konsep Siswa Tema Gerak Tumbuhan. *Unnes Science Education Journal, 5(2):1288-1297*

Utami, R., Sumarni, W. & Habibah, N. A. (2014). Efektivitas Lembar Kerja Peserta didik (LKS) IPA Terpadu Tema Pencemaran Lingkungan Terhadap Penanaman Nilai Karakter dan Pemahaman Konsep. *Unnes Science Education Journal* 3 (2), 487-493.

Vikagustanti, D.A, Sudarmin, S & Pamelasari, S. D. (2014). Pengembangan Media Pembelajaran Monopoli IPA Tema Organisasi Kehidupan Sebagai Sumber Belajar Untuk Peserta didik SMP. *Unnes Science Education Journal*, 3(2),1-8.

Wasilah, E.B. (2012). Peningkatan Kemampuan Menyimpulkan Hasil Praktikum IPA Melalui Penggunaan Media Kartu. *Jurnal Pendidikan IPA Indonesia*, 1(1), 82-90.

Zhu, D. (2012). Using Games to Improve Students' Communicative Ability. *Journal of Language Teaching & Research*, *3*(4):801-805