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Correlation of Science Process Skills with Students' Creativity in Learning of Creative Problem Solving Model with an Inquiry Approach on the Simple Harmonic Motion

Sumarli [1*)], Haris Rosdianto [2], Buyung [3]
STKIP Singkawang, Indonesia[1,2,3]
[*)]Corresponding E-mail: sumarliphysics@gmail.com

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ABSTRACT
This study aimed to determine the correlation of science process skills with students' creativity in learning of creative problem solving model with an inquiry approach on the simple harmonic motion. The study method that was used is a correlation study between science process skills with students' creativity. The sample was chosen by using the purposive sampling technique that total of 34 students in X MIA5 grade of the academic year 2016/2017 in one of the senior high schools in Semarang. The data collection was conducted by using a science process skills test and creativity test in essay form on the simple harmonic motion. Data were analyzed through correlation test by Pearson Product Moment technique and t-test. The results showed the value of r is 0.332 with low category and the value of t_{count} *is 1.992 lower than* t_{table} *is 2.042 with a significance level of 5% and df is 32. This indicated that there was no significant correlation between science process skills with students' creativity in learning of creative problem-solving model with an inquiry approach on the simple harmonic motion. This meant that students with high science process skills do not always show high creativity too in learning of creative problem-solving model with an inquiry approach on the simple harmonic motion.*

INTRODUCTION

One of the objectives of learning physics as stated in the Regulation of the Minister of National Education of the Republic of Indonesia Number 23 of 2006 is to develop the experience to be able to formulate problems, propose and test hypotheses through experiments, design, and assemble experimental instruments, collect, process and interpret data, and communicate experimental results orally and in writing [1]. Based on these objectives, learning physics is not only seen from the results but also when the learning process takes place. This is following the 2013 Curriculum which is currently being applied with the concept of providing a learning experience for students in developing attitudes, skills, and knowledge [2].

Physics learning that provides direct experience can make students able to understand the meaning of the learning they do. This is because physics is not only learned through mastering a collection of knowledge in the form of facts, principles, or concepts alone but is also a process of discovery obtained by systematically finding out about natural phenomena [3]. So that learning can provide direct experience for students, the learning process should be able to practice various skills possessed by students, including science process skills.

Process skills are skills that involve cognitive or intellectual skills through the ability to think logically and systematically in solving problems, manual skills through the use of tools and materials in assembling experiments, and social skills through interactions between fellow students and teachers in communicating learning outcomes [4]. In science learning, science process skills are described as physical and mental skills that function as tools for problem-solving, individual and social development and are effectively applied in science learning [5] [6]. Science process skills are also directed skills that can be used to find certain concepts and develop pre-existing concepts and are used to refute a discovery [7] [8]. Students' process skills can also be measured and improved through activities carried out by students during the learning process [4]. Therefore, science process skills need to be developed so that students can construct their knowledge in making discoveries so that students can solve physics problems and understand the material that has been studied [9]. This was reinforced by Siradjuddin, Rosdianto, and Sulistri [10], science process skills are very important for developing education science and student learning quality both theory and skills in experimenting especially in studying physics.

Science process skills are thought to have a relationship with students' creativity. This is shown by Rahayu et al. [11] which stated that there is an increase in student learning outcomes and creative thinking skills after the application of the process skills approach to the subject of heat. Akinbobola and Afolabi [6] recommended that science process skills need to be integrated with physics practicum exams to enable students to develop creativity, problem-solving, reflective thinking, originality, and invention which are important ingredients for science and technology development.

Student creativity needs to be developed early because creativity is part of high-level thinking skills in addition to critical thinking students who must have students in the current era of globalization whose direction and development of people's thoughts never sequence and prosecuted but random and unpredictable [12] [13]. Creativity is the ability to find many possible answers to a problem with emphasis on quantity, capacity, and diversity of answers [14]. Creativity can be said to be a product of the creative thinking process Someone. When creative thinking is needed a balance between logic and creativity. To bring up creativity, then freedom of thinking is needed not under control and pressure. Creative thinking ability can also be called the ability of logical thinking and divergent thinking based on intuition but has a definite goal [15]. Creative thinking ability is defined as an ability that reflects aspects of fluency, flexibility, originality, and elaboration [14] [16] [17]. However, on the creativity criteria, aspects of originality and detail (elaboration) on the criteria of creative thinking ability are summarized into novelty aspects which show students' ability to solve problems with several different solutions and different answers, especially finding new solutions that are not found by students in general [18].

However, based on the results of the Program for International Student Assessment (PISA) survey in 2018 it showed that Indonesia was at level 61 of the 79 countries that participated in the scientific literacy field with a score of 396 [19]. The low achievement of scientific literacy in Indonesian students is due to learning that does not involve scientific processes, such as identifying scientific problems, explaining phenomena scientifically, and drawing conclusions based on scientific facts [20]. According to Belen [21], the low ranking of Indonesian students was caused by the learning that has been applied since elementary school is still not optimal. The learning does not contain active, creative, and problem-solving learning activities. Student activities are only limited to listening, taking notes, answering questions when the teacher asks questions, then the learning process does not encourage students to think critically and creatively in their activities [22]. Such learning makes students tend to be passive and apathetic during the physics learning process. If this is continued, it will make students' scientific process skills and creativity not develop [11] [23] [24].

In line with that, physics is also considered one of the subjects that are difficult to understand by most students. This is because physics requires complicated mathematics [25] [26], too much material, depending on textbooks, abstract and complex [26] [27], requires laboratory activities, and misconceptions often occur [28].

One of the physics materials studied in this study and is still considered difficult by students is Simple Harmonic Motion (SHM). This is evidenced by several research results, including during the simple pendulum swing practicum, students often use too large a deviation angle and cause the pendulum motion to be periodic so that the practical results deviate from the theory [29]. In addition, there are still some students who fail to relate the concepts of acceleration, reference point, and displacement with SHM [30]. Students also sometimes have difficulty understanding the concept of the period of vibration on a simple pendulum that does not depend on the mass of the pendulum [31]. On the other hand, SHM material was chosen in this study also with the consideration that this material contains aspects of science process skills that can provide direct learning experiences for students.

Learning processes that provide hands-on experience can help students acquire long-term memory so that they can construct their knowledge in developing their scientific process skills and creativity. One of the learning models that are suitable for these problems is the Creative Problem Solving (CPS) learning model with an inquiry approach. Based on the results of previous research, it was found that the CPS learning model with an inquiry approach was effective on students' science process skills [32]. CPS is a learning model designed to build students' creativity and problem-solving skills [33] [34] [35] [36]. CPS is also one of the learning models that can motivate and involve students actively in learning [37].

Meanwhile, learning physics with an inquiry approach is significantly better than traditional learning [38]. This is because inquiry involves maximally all students' abilities to seek and investigate systematically, critically, logically, analytically, so that they can formulate their findings confidently [39] [40] [41]. Inquiry learning is student-centered learning with involves students in exploring problems, proposing and testing conjectures, developing evidence or solutions, and explaining their ideas [42]. Inquiry learning is very effective in developing students' science process skills [43]. Inquiry learning can also increase students' creativity because in the inquiry process students are trained to think divergently [44] [45]. Based on this explanation, this research was conducted aiming to determine the correlation between science process skills with students' creativity in learning of CPS model with an inquiry approach on the SHM.

METHOD

This research was a type of correlation research between science process skills with students' creativity. The population in this study were students of class X MIA Islamic Senior High School Sultan Agung 1 Semarang in the 2016/2017 academic year. Sampling in this study used a purposive sampling technique, namely taking samples with the consideration that students were already in certain classes based on the principal's decision so that it was not possible to create a new class by randomly selecting students from each class as an experimental class. The sample was chosen by one class, namely class X MIA5 which amounted to 34 students as the experimental class. The instrument in this study was an essay test consisting of 10 questions of science process skills and 3 questions of creativity which had been declared valid and reliable. The science process skills test was prepared by fulfilling the indicators from Rustaman [4] which consisted of observing, classifying, interpreting, predicting, asking questions, hypothesizing, planning experiments, using tools/materials, applying concepts, and communicating. The students' creativity test was prepared by fulfilling the indicators from Silver [46] which consisted of fluency, flexibility, and novelty. Data analysis used descriptive analysis techniques. Processing of correlation data between variables using the Pearson Product Moment correlation equation and statistical tests using t-test.

RESULTS AND DISCUSSIONS

In previous research, it was found that the CPS learning model with an inquiry approach was effective on students' science process skills with the following criteria: students' science process skills had fulfilled the classical mastery proportion, which exceeded 75% and there was an increase in students' science process skills with a score of N- gain 0.67 (medium criteria) [32]. Furthermore, in this study, a correlation test was conducted between science process skills with students' creativity in CPS learning with an inquiry approach on SHM.

Based on the results of the normality test of the science process skills test data, the value of $L_0 = 0.071 < L_{table} = 0.152$ with n = 34 and a significance level of 5%, the data came from a normally distributed population. The results of the normality test of creativity test data obtained a value of $L_0 = 0.149 < L_{table} = 0.152$ with n = 34 and a significance level of 5%, then the data came from a normally distributed population. These results indicated that the next step of the correlation test uses parametric statistics.

The correlation test used to determine the relationship between science process skills with students' creativity which was normally distributed was the Pearson Product Moment correlation technique. The correlation test between science process skills with students' creativity in CPS learning with an inquiry approach uses the test results of science process skills and student creativity in the form of an essay test. Putra et al. [47] and Dyson et al. [48] used a creativity test in the form of a written test to obtain data on students' creative thinking skills and creative potential. The relationship between science process skills and students' creativity is shown in Fig. 1.

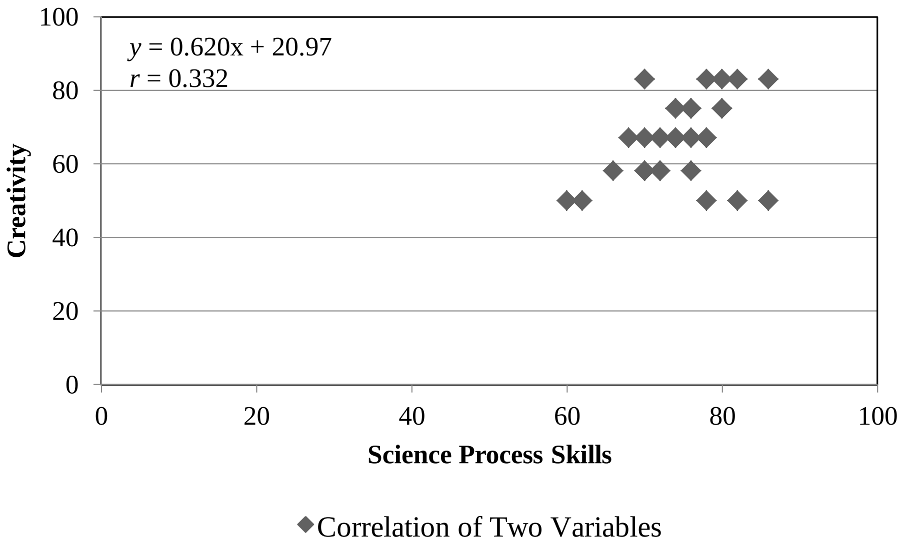

Fig 1. *Graph of Correlation between Science Process Skills with Student Creativity*

Based on Fig. 1, the positive correlation coefficient value is 0.332. If the correlation coefficient is interpreted, then the positive correlation between science process skills with students' creativity is in a low category. This means that the higher the student's science process skill test value, the higher the creativity value is not necessarily. Vice versa, low science process skills test value does not necessarily mean low creativity.

The t test is used to determine the significance value of the correlation coefficient value that had been obtained. Based on the calculation results, the value of t_{count} = 1,992 < t_{table} = 2,042 with a significance level of 5% and df = 34 – 2 = 32, then H_0 is accepted. This means that there was no significant correlation between science process skills with students' creativity. So, it could be concluded that the correlation coefficient value obtained from the sample data of class X MIA5 students cannot be generalized to the entire population of class X MIA students.

The results of the correlation test showed that there was no significant correlation between science process skills with students' creativity. This means that students with a high level of science process skills do not necessarily show a high level of creativity and vice versa. This was reinforced by the results of research which shows that creative children are not always cognitively capable [49] [50] [51] [52].

Science process skills are a series of learning activities. The process of observing, predicting, hypothesizing to communicating is a student activity to find concepts. In contrast to creativity, which is the development of ideas and rethinking of the acquired knowledge. The two are different and unrelated things. Students who have high activity do not necessarily have high creativity or vice versa [53].

Science process skills in its application aim to find and understand concepts to increase student's cognitive abilities, while creativity does not always correlate with the level of cognitive abilities. Munandar [14] stated that intelligence will affect creativity at the intelligence level of 120 but an increase in intelligence is not always followed by an increase in creativity. Kim and VanTassel-Baska [54] revealed that the intelligence threshold of 120 (critical IQ) has a correlation between intelligence and creative potential but if it is above the threshold the correlation between intelligence and creativity will decrease.

Sugiyono [55] stated that in a correlation there is a determining coefficient whose magnitude is the square of the correlation coefficient or r^2 which is called the coefficient of determination. The meaning of this coefficient is that the variance in the dependent variable can be explained through the variance in the independent variable. If the value of r in Fig. 1 is squared, then we get r^2 of 0.11. This means that 11% of students' creativity is influenced by the students' science process skills and 89% is influenced by other factors. This was reinforced by the statement of Delismar et al. [56] that science process skills are not the main factor influencing creativity. Many other factors can inhibit or increase creativity, both internal and external. Munandar [14] stated that students' external environment influences creativity, both in the macro-environment (culture, society) and the micro-environment (family, school, and peers). Tajalli & Zandi [57] also argued that work skills and creative thinking partly have to do with innate creativity, some with learning, and some with the learning environment. Sternberg [58] stated that creativity in education is when students understand a way out of the ordinary and remain calm to solve problems in their groups.

Munandar [44] revealed that creativity is all unique productive efforts from individuals, a person is required to have the ability to think and find something new through environmental conditions and consider aspects of his personality. The creative thinking process in the form of the discovery of new concepts, principles, and ideas requires conducive conditions with wide opportunities. The learning process that only lasted a few meetings did not provide broad opportunities for students so that creativity was not always correlated with the processes that occurred during learning, namely science process skills.

In addition, shame and fear of being different [59] [60], emotions [61], and continuous repetition of activities [62] are factors that can hinder the development of creative thinking abilities. Olson also revealed that the obstacles that a person might face in creative thinking are habits/traditions, limited time and energy, an unsupportive social environment, urgent needs, unsupportive criticism, fear of failure, and complacency [63].

CONCLUSION AND SUGGESTION

Based on the results of the study, it could be concluded that there was no significant correlation between science process skills with students' creativity in learning the CPS model with an inquiry approach on the SHM. This means that students with high science process skills do not always show high creativity as well. The insignificant correlation between science process skills with students' creativity shows that cognitive abilities are not always related to students' creativity, so it is necessary to design learning plans that focus on training students' abilities to think divergently and minimize factors that can hinder students' creativity.

REFERENCES

[1] Permendiknas Nomor 23 Tahun 2006 tentang Standar Kompetensi Lulusan untuk Satuan Pendidikan Dasar & Menengah. Jakarta: Kementerian Pendidikan Nasional.
[2] Wamendikbud Bidang Pendidikan. (2014). *Konsep dan Impelementasi Kurikulum 2013*. Jakarta: Kementerian Pendidikan dan Kebudayaan.
[3] Zulfiani., Feronika, T., & Suartini, K. (2009). *Strategi Pembelajaran Sains*. Jakarta: Lembaga Penelitian UIN Syarif Hidayatullah.
[4] Rustaman, N.Y. (2005). *Strategi Belajar Mengajar Biologi*. Malang: UM Press.
[5] Semiawan, C. (1992). *Pendekatan Keterampilan Proses Bagaimana Mengaktifkan Siswa dalam Belajar.* Jakarta: PT Grasindo.
[6] Akinbobola, A. O., & Afolabi, F. (2010). Analysis of Science Process Skills in West African Senior Secondary School Certificate Physics Practical Examinations in Nigeria. *Amerika Eurasian Journal of Scientific Research*, *5*(4): 234-240.
[7] Indrawati. (1999). *Keterampilan Proses Sains: Tinjauan Kritis dari Teori ke Praktis*. Bandung: Dirjen Pendidikan Dasar dan Menengah.
[8] Sutiadi, A. (2013). *Bahan Ajar Workshop Penyusunan Instrumen Soal Kognitif dan Keterampilan Proses Sains*. Bandung: Jurusan Pendidikan Fisika FPMIPA UPI.
[9] Semiawan, C. (1985). *Pendekatan Keterampilan Proses.* Jakarta: Gramedia.
[10] Siradjuddin, Rosdianto, H., & Sulistri, E. (2018). Penerapan model REACT untuk meningkatkan keterampilan proses sains siswa pada materi arus listrik. *Jurnal Pendidikan Fisika Dan Keilmuan (JPFK)*, *4*(1): 17–22.
[11] Rahayu, E., Susanto, H., & Yulianti, D. (2011). Pembelajaran Sains Dengan Pendekatan Keterampilan Proses Untuk Meningkatkan Hasil Belajar Dan Kemampuan Berpikir Kreatif Siswa. *Jurnal Pendidikan Fisika Indonesia*, *7*: 106-110.
[12] Anderson, L.W., and Krathwohl, D.R. (2001). A Taxonomy of Learning, Teaching, and Assessing: A Revision of Bloo m's Taxonomy of Educational Objectives. New York: Longman.
[13] Sumarli, S. (2018). Analisis Model Pembelajaran Tipe Think-Pair-Share Berbasis Pemecahan Masalah Terhadap Keterampilan Berpikir Tingkat Tinggi Siswa. *JIPF (Jurnal Ilmu Pendidikan Fisika)*, *3*(1): 8-13.
[14] Munandar, U. (2009). *Pengembangan Kreativitas Anak Berbakat*. Jakarta: Rineka Cipta.
[15] Siswono, T.Y.E. (2010). Leveling Students' Creative Thinking in Solving and Posing Mathematical Problem. *IndoMS. J.M.E.*, *1*(1): 17-40.
[16] Nakin, J.B.N. (2003). *Creativity and Divergent Thinking in Geometry Education*. University South Africa.
[17] Peng, S.L., Cherng, B.L., & Chen, H.C. (2013). The Effects of Classroom Goal Structures on The Creativity of Junior High School Student. *Educational Psychology: An International Journal of Experimental Educational Psychology*, *33*(5): 540-560.
[18] Siswono, T.Y.E. 2011. "Level of Students' Creative Thinking in Classroom Mathematics". *Educational Research and Review, 6*(7): 548-553.
[19] OECD (2019), *PISA 2018 Results (Volume I): What Students Know and Can Do*. Paris: PISA, OECD Publishing. https://doi.org/10.1787/5f07c754-en.
[20] OECD. (2007). *PISA 2006: Science Competencies for Tomorrow's World*. http://www.oecd.org.

(Accessed on September 20, 2016).
[21] Belen, S. (2011). *Belajar Aktif dan Terpadu*. Surabaya: Duta Graha Pustaka.
[22] Sardiman, A.M. (2007). *Interaksi dan Motivasi Belajar Mengajar: Pedoman Bagi Guru dan Calon Guru*. Jakarta: PT Raja Grafindo Persada.
[23] Rahmawati, D., Nugroho, S.E., & Putra, Ng.M.D. (2014). Penerapan Model Pembelajaran Kooperatif Tipe *Numbered Head Together* Berbasis Eksperimen untuk Meningkatkan Keterampilan Proses Sains Siswa SMP. *Unnes Physics Education Journal*, *3*(1): 40-45.
[24] Tirtiana, C.P. 2013. Pengaruh Kreativitas Belajar, Penggunaan Media Pembelajaran PowerPoint, dan Lingkungan Keluarga Terhadap Hasil Belajar Mata Pelajaran Akuntansi pada Siswa Kelas X Akt SMK Negeri 2 Blora Tahun Ajaran 2012/2013 (Motivasi Belajar Sebagai Variabel Intervening)". *Economic Education Analysis Journal*, *2*(2): 15-23.
[25] Nashon, S.M. (2003). The Status of Physics 12 in BC: Reflections from UBC Science Teacher Candidates. *Conference Proceedings CD of the National Association for Research in Science Teaching* (NARST), Philadelphia.
[26] Campbell, J. (2007). Using Metacogs to Collaborate with Students to Improve Teaching and Learning in Physics. *Educational Insights*, *11*(2). http://www.ccfi.educ.ubc.ca/publication/insights/v11n02/articles/campbell.html (Accessed on January 15, 2017).
[27] Sheppard, K., & Robbins, D.M. (2003). Physics was Once First and was Once for All. *The Physics Teacher*, *41*: 420-424.
[28] Heller, K., & Heller, P. (1999). *Problem-Solving Laboratories*. Cooperative Group Problem-Solving in Physics. The University of Minnesota.
[29] Huriawati, F., & Yusro, A.C. (2016). Pengembangan Odd 'Osilator Digital Detector' sebagai Alat Peraga Praktikum Gerak Harmonik Sederhana. *Jurnal Inovasi dan Pembelajaran Fisika*, *3*(2).
[30] Madu, B.C. (2012). Effect of The Four-Step Learning Cycle Model on Students' Understanding of Concepts Related to Simple Harmonic Motion. In *Asia-Pacific Forum on Science Learning and Teaching*, *13*(1): 1-22.
[31] Richardson, T.H., & Brittle, S.A. (2012). Physical Pendulum Experiments to Enhance The Understanding of Moments of Inertia and Simple Harmonic Motion. *Physics Education*, *47*(5): 537-544.
[32] Sumarli, S., Nugroho, S. E., & Yulianti, I. (2018). Keefektifan Model Pembelajaran Creative Problem Solving Berpendekatan Inquiry terhadap Keterampilan Proses Sains Siswa. *Physics Communication*, *2*(1): 63-69.
[33] Siswono, T.Y.E. (2004). Identifikasi Proses Berpikir Kreatif Siswa dalam Pengajuan Masalah (Problem Posing) Matematika Berpandu dengan Model Wallas dan *Creative Problem Solving* (CPS). *Buletin Pendidikan Matematika*, *6*(2): 1-16.
[34] Chant, R.H., Moes, R., & Ross, M. (2009). Curriculum Construction and Teacher Empowerment: Supporting Invitational Education with a Creative Problem Solving Model. *Journal of Invitational Theory and Practice*, *15*: 55-67.
[35] Mohamed, A., Maker, C.J., & Lubart, T. (2012). Exploring the Domain Specificity of Creativity in Children: The Relationship between a Non-Verbal Creative Production Test and Creative Problem-Solving Activities. *Turkish Journal of Giftedness and Education*, *2*(2): 84-101.
[36] Maharani, H.R., Waluya, S.B., & Sugianto. (2015). Humanistic Mathematics Learning with Creative Problem Solving Assisted Interactive Compact Disk to Improve Creative Thinking Ability. *International Journal of Education and Research*, *3*(1): 207-216.
[37] Samson, P.L. (2015). Fostering Student Engagement: Creative Problem-Solving in Small Group Facilitations. *Collected Essays on Learning and Teaching*, *8*: 153-164.
[38] Hussain, A., Azeem, M., & Shakoor, A. (2011). Physics Teaching Methods: Scientific Inquiry Vs Traditional Lecture. *International Journal of Humanities and Social Science*, *19*(1): 269-276.
[39] Gulo. W. (2004). *Strategi Belajar Mengajar*. Jakarta: PT Gramedia Widiasarana.
[40] Youngquist, J., & Pataray-Ching, J. (2004). Revisiting 'Play': Analyzing and Articulating Acts of Inquiry. *Early Childhood Education Journal*, *31*(3): 171-178.
[41] Bell, R.L., Smetana, L., & Binns, I. (2005). Simplifying Inquiry Instruction: Assessing The Inquiry Level of Classroom Activities. *The Science Teacher*, *72*(7): 30-33.

[42] Kogan, M., & Laursen, S.L. (2014). Assessing Long-Term Effects of Inquiry-Based Learning: A Case Study from College Mathematics. *Innovation of High Education, 39*: 183-199.
[43] Khan, M., & Iqbal, M.Z. (2011). Effect of Inquiry Lab Teaching Method on the Development of Scientific Skills Through the Teaching of Biology in Pakistan. *Language in India*, *11*(1): 169-178.
[44] Munandar, U. (1999). *Mengembangkan Bakat dan Kreativitas Anak Sekolah. Petunjuk bagi Para Guru dan Orang Tua*. Jakarta: Gramedia Widyasara Indonesia.
[45] Widowati, A. (2007). Penerapan Pendekatan *Inquiry* dalam Pembelajaran Sains sebagai Upaya Pengembangan Cara Berpikir Divergen. *Majalah Ilmiah Pembelajaran*, *3*(1): 14-26.
[46] Silver, E.A. (1997). Fostering Creativity through Instruction Rich in Mathematical Problem Solving and Thinking in Problem Posing. *International Reviews on Mathematical Education, 29*(3): 75-80.
[47] Putra, T.T., Irwan., & Vionanda, D. (2012). Meningkatkan Berpikir Kreatif Siswa dengan Pembelajaran Berbasis Masalah. *Jurnal Pendidikan Matematika*, *1*(1): 22-26.
[48] Dyson, S.B., Chang, Y.L., Chen, H.C., Hsiung, H.Y., Tseng, C.C., & Chang, J.H. (2016). The Effect of Tabletop Role-Playing Games on The Creative Potential and Emotional Creativity of Taiwanese College Students. *Thinking Skills and Creativity*, *19*: 88-96.
[49] Ferrando, M., Prieto, M.D., Ferrandiz, C., & Sanchesz, C. (2005). Intelligence and Creativity. *Electronic Journal of Research in Education*, *3*(3): 21-50.
[50] Kim, K.H. (2005). Can Only Intelligent People Be Creative? A Meta-Analysis. *The Journal of Secondary Gifted Education*, *16*(2-3): 57-66.
[51] Cromie, W.J. (2007). *Creativity Tied to Mental Illness: Irrelevance Can Make You Mad*. Online. http:/-/www.news.harvard.edu/gazette/...reativity.html (Accessed on August 6, 2017).
[52] Slameto. (2010). *Belajar & Faktor-Faktor yang Mempengaruhi*. Edisi Revisi. Jakarta: Rineka Cipta.
[53] Widyaningsih, S.Y., Haryono., & Saputro, S. (2012). Model MFI dan POGIL Ditinjau dari Aktivitas Belajar dan Kreativitas Siswa terhadap Hasil Belajar. *Jurnal Inkuiri*, *1*(3): 266-275.
[54] Kim, K.H., & VanTassel-Baska, J. (2010). The Relationship between Creativity and Behavior Problems among Underachievers. *Creativity Research Journal*, *22*: 185-193.
[55] Sugiyono. (2016). *Metode Penelitian Kombinasi (Mixed Methods)*. Bandung: Alfabeta.
[56] Delismar., Ashyar, R., & Hariyadi, B. (2013). Peningkatan Kreativitas dan Keterampilan Proses Sains Siswa melalui Penerapan Model *Group Investigation*. *Jurnal Edu-Sains*, *1*(2): 25-32.
[57] Tajalli, F.B., & Zandi, Z. (2010). Creativity Comparison between Students who Studied Life Skills Courses and Those who didn't. *Procedia Social and Behavioral Sciences*, *5*: 1390-1395.
[58] Sternberg, R.J. (2006). The Nature of Creativity. *Creativity Research Journal, 18*(1): 87-98.
[59] Surya, H. (2013). *Cara Belajar Orang Genius*. Jakarta: Kelompok Gramedia.
[60] Anugrahaini, U.S., Nugroho, S.E., & Yulianto, A. (2016). Analisis Kemampuan Berpikir Kritis dan Kreatif pada Penyusunan Laporan Praktikum Fisika Dasar. *Physics Communication*, *1*(1): 22-32.
[61] Sayadian, S., & Lashkarian, A. (2015). EFL Learners' Creative Thinking and Their Achievement Emotions. *Procedia Social and Behavioral Sciences*. *199*: 505-509.
[62] Chena, A., Dong, L., Liu, W., Li, X., Sao, T., & Zhanga, J. (2015). Study on The Mechanism of Improving Creative Thinking Capability Based on Extinct. *Prosedia Computer Science*, *55*: 119-125.
[63] Yunianta, T.N.H. (2014). Hambatan Seseorang Mengembangkan Kemampuan Berpikir Kreatif Matematis. *Jurnal Ilmiah Pendidikan*, *Sejarah dan Sosial Budaya*, *16*(2): 48-60.