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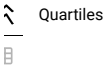
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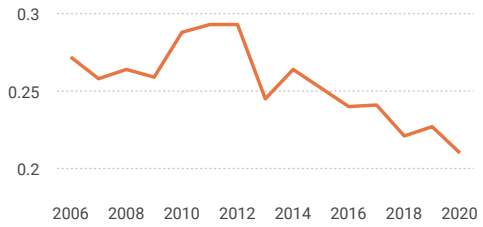

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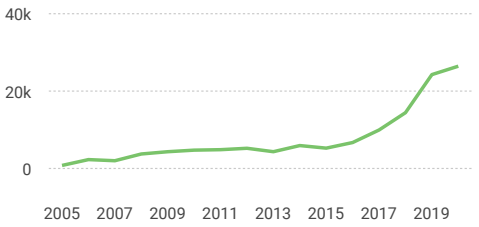

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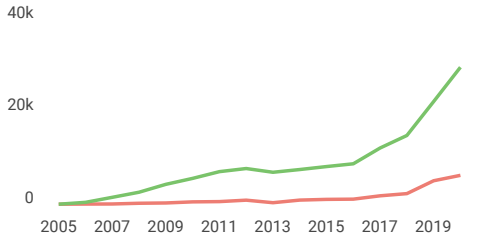

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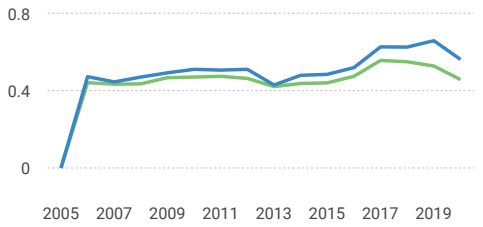

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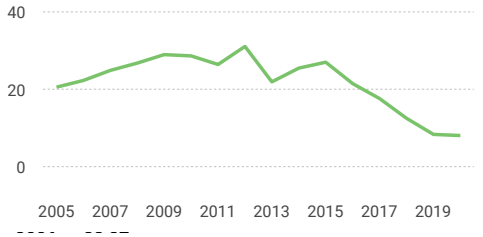

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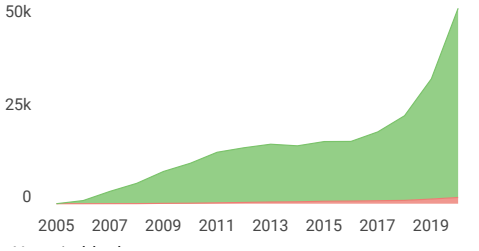

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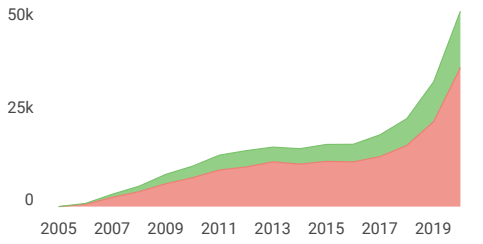

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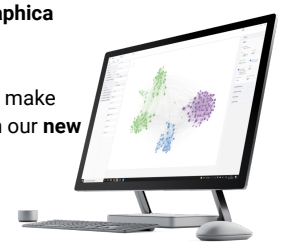

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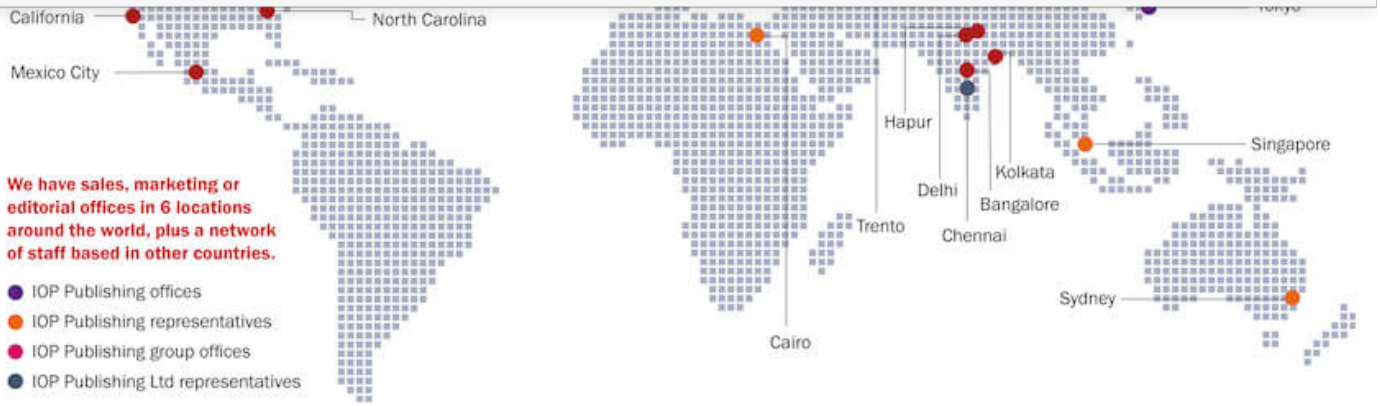

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Minimizing misconception on the topic of temperature and heat by edmodo learning media

Mursalin[1] and A H Odja[1]

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Abstract

This design pre-test post-test control group experiment was aimed to improve student's understanding of the concept and to minimize their misconceptions on the topic of Temperatur and Heat. The subjects of this research were selected 'using cluster random sampling from High School students in Gorontalo. The instruments used to collect the data are multiple choice tests. The data were analysed using t-test and the students' conception profile was carried out using Certainty of Response Index technique. The results of this research show the significant difference in the post-test average and normalized gain average between the experimental class (81.976 and 0.679) and control class (68.267 and 0.437) and t_{count} = 12.575 greater than t_{table} = 2.000 on the confidence level 0.05. These results of research are supported by the fact that misconceptions in the experimental class are smaller than those in the control class. The implementation of edmodo learning media is effective to improve student's understanding of the

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Minimizing misconception on the topic of temperature and heat by edmodo learning media

Minimizing misconception on the topic of temperature and heat by edmodo learning media

Mursalin[1] and A H Odja[1*]

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Abstract. This design pre-test post-test control group experiment was aimed to improve student's understanding of the concept and to minimize their misconceptions on the topic of Temperatur and Heat. The subjects of this research were selected 'using cluster random sampling from High School students in Gorontalo. The instruments used to collect the data are multiple choice tests. The data were analysed using t-test and the students' conception profile was carried out using Certainty of Response Index technique. The results of this research show the significant difference in the post-test average and normalized gain average between the experimental class (81.976 and 0.679) and control class (68.267 and 0.437) and t_{count} = 12.575 greater than t_{table} = 2.000 on the confidence level 0.05. These results of research are supported by the fact that misconceptions in the experimental class are smaller than those in the control class. The implementation of edmodo learning media is effective to improve student's understanding of the concepts and minimize their misconceptions on the topic of Temperatur and Heat

1. Introduction

Improper understanding of concepts is called misconception [1-6]. Some researchers describe students' difficulties in understanding the concept of kinematics [7-10]. The students' difficulties understanding the concept of physics is causing misconceptions. Students' misconceptions in physics will occur if their conception is contrary to the experts' conception. Some physics education researchers define concepts as grouping a number of objects, phenomena, events, or processes in terms of their characteristics [2,3].

Understanding of concepts is the most urgent aspect in the process of learning physics. The proper understanding of facts, concepts, principles, and laws of physics can be done through constructivism learning theory. This theory states that students must actively to construct their knowledge and turn it into a complete understanding, and the teacher is facilitates it by providing facilities, learning resources and an environment that conducive to constructing their knowledge, stimulating curiosity and helping the students to communicate their ideas, and monitoring and evaluating student activities in the learning process [11].

Understanding of concept of physics based on constructivism is believed can be done through information technology media that utilize internet networks (online). Minister of National Education Regulation Number 16 in 2007 states that teacher competencies expected to be mastered are utilizing information technology media for the benefit of learning implementation. The challenges of 21st

century learning and changes to the 2013 curriculum require the pedagogical ability of teachers to be able to design learning that is more interesting and meaningful by utilizing internet networks [12].

The learning media is an important component in a learning system whose main function is to convey the content or subject matter so that it can be understood by students [13]. The right use learning media will help learning programs create that effective, efficient and interesting. The developments show that digital technology and internet networks has given that significant influence on the student learning activities in obtaining information and knowledge. The use of technology in learning systems are raised to e-learning that transforms conventional learning system into media models, including edmodo learning media.

According to Brown and Feasey, e-learning media such as edmodo learning media is learning that utilizes internet networks, LAN, WAN as a delivery method, interaction, and facilities that supported by various of forms the learning services [14]. Onno W Purba stated that e-learning is a form of information technology that applied in the education field in the virtual schools [15]. E-learning is a learning concept that defined as the use of internet technology that is used to access the curriculum and learning resources that contain information and knowledge outside the conventional education system [13].

The based on the description above, this research was describes efforts to improve understanding of concepts and minimize students' misconceptions on the topic of Temperature and Heat by using edmodo learning media.

2. Methods

The subject of this experiment research were selected from X classes by using cluster random sampling technique on the high school in Gorontalo. The number of respondents was 32 students in the experimental class and 32 students in the control class. This experiment research used the Pretest-Posttest Control Group Design [16,17]. In answering the multiple choice test, the students were also asked to give the score of confidence level about the accuracy of the answers with using the scale 0 to 5. The score 0 states that totally guessed answer, score 1 states almost guess, score 2 states not sure, score 3 states sure, score 4 states almost very confident, and score 5 states very confident (certain). The combination of the accuracy of the answers and the level of confidence of students in answering the test is used to express the level of student understanding of the concepts of temperature and heat tested as presented in Table 1.

Table 1. Rubric of understanding level according to accuracy of answers and level of confidence [18, 19].

Answer	Understanding Level According to Score Confidence Level					
	5	4	3	2	1	0
True	Very Good	Good	Enough		Weak	
False	Misconception				Weak	

The data in Table 1 is categorized as understanding of concepts, misconceptions, and not understanding of concepts. The pre-test was aimed to determine the homogeneity level of students 'understanding of concepts, while the post-test was aimed to determine the differences in the students' understanding of concepts between the experimental class and the control class on the temperature and heat topic. The normalized gain average <g> of the experiment class and control class was calculated from the results of the pre-test and post-test by using the equation [20].

The value of normalized gain average for experiment class and control class are determine the success of the experiment, while differences in students' understanding on temperature and heat topic were analysed by using the t-test at the convidence level 0.05.

3. Result and Discussion

Data pre-test, post-test, and normalized gain averages for the experiment class and control class as presented in Table 2.

Table 2. Pre-test, Posttest and Normalized Gain Averages

Pretest Average		Posttest Average		Gain Average	
Experiment	Control	Experiment	Control	Experiment	Control
43,8	43,6	81,967	68,267	0,679	0,437

The data pre-test average in Table 2 show that there is no difference in the students' understanding initial between the experiment class and the control class or homogeneous. But the data post-test average shows the difference in understanding of the concept between the experiment class and the control class, which occurs in the normalized gain average <g> in the medium category.

The results of the t-test was obtained t_{count} = 12.575 greater than t_{table} = 2.000 on the confidence level 0.05 and degrees of freedom is 62. This result indicates the differences of the students' understanding on the temperature and heat topic between the experiment class and control class after the application of the Jigsaw cooperative learning model. Thus the application of the Jigsaw cooperative learning model is effective in increasing students' conceptual understanding on the temperature and heat topic. This result is similar to the research result of [21] that the application of the Predict-Observe Explain (POE) learning model effectively improves understanding of concepts and minimize misconceptions on the electrical circuits topic; and [22] stated that the application of the POE learning model was able to improve the mastery of students' concepts and generic skills on the dynamic fluid topic.

The difference in the students' understanding between the experiment class and the control class is due to the application of constructivism learning theory on the experimental class, which is the each group member has responsibility, cooperate with each other, and helps each other in understanding the subject matter, and empowers of the peer tutors from the expert group. The experiment class is also a democratic class where each student has the opportunity to express his opinion freely, and the application of scaffolding technique for data analysis and conclusions.

The application of CRI and interviews techniques can be described as causes of the students' misconceptions on the temperature and heat topic. First, 75% of 32 students of the experiment class and 78% of the 32 students of the control class were stated that water in the glasses A and B (same temperature) are mixed in glass C, the mixed of temperature was twice the temperature of water in glass A or glass B. Next, the water in the glass A is poured as much into glasses B and C, the temperature of water in the glasses B and C becomes half of the original temperature. They reasoned that the mass of the water was increased to twice the original mass or reduced by half of the original mass. Even though if the measured by using a thermometer will get the temperature of water in glasses A, B, and C are the same.

Second, 88% of 32 students of the experiment class and 81% of 32 students of the control class were stated that if two objects with same the mass and different of temperatures, it touch each other there will be a flow of temperature from high-temperature objects to low-temperature objects. They reason that the temperature can flow as it does with water flowing from high place to low place. They cannot distinguish between the temperature and heat concepts. Even though if asked to heat one end of the metal rod and the other end is held it will get the end of the metal rod held is hot.

Third, 91% of 32 students of the experimental class and 94% of 32 students of the control class were stated that if two objects with the mass and the temperature are the same but different heat capacity, it touch each other, then heat capacity is flow from objects that have a high heat capacity to objects that have a low heat capacity. They also state that if two objects with the mass and temperature are the same but different specific heat, it touch each other, then specific heat flow from object that has a high specific heat to object that has a low specific heat. Even though the heat capacity indicate the characteristics of objects and specific heat indicate the characteristics of substances that cannot move from one object to another.

Fourth, 97% of 32 students of the experiment class and 88% of 32 students of the control class stated that if two objects (same the mass) are different of specific heat and its heated together, then both objects have the same of heat. They also state that if two objects (same the mass) are different of heat capacity and its heated together, then both objects have the same of heat. Even though the object that have the large of heat capacity or specific heat, it is faster to heat than the object have the small of heat capacity or specific heat.

Fifth, 84% of 32 students of the experiment class and 91% of 32 students of the control class stated that if 100 grams of ice at -10^{o} C were heated to become vapour, then the temperature of the ice always increase and was never constant. Even though the relationship graph between the increase of temperature and the amount of absorbed the heat by ice, are be obtained: Ice temperature is increase from -10^{o}C ice to 0^{o}C ice, the ice temperature is constant from 0^{o}C ice to 0^{o}C water, the water temperature is increase from 0^{o}C water to 100^{o}C water, the water temperature is constant from 100^{o}C water to 100^{o}C vapor, then increase again.

The findings of the misconception as described above are verification of some of the results of research in Indonesia as mentioned by [2,6], and [23] in France. The findings of their research the mention that the occurrence of misconceptions on the temperature and heat topic was caused by the students' initial concept or preconception. They mention a lot of the number and types of students' misconceptions on the temperature and heat topic. Ffor example: temperature, specific heat and heat capacity are considered as something that can flow, the difference of concept between temperature and heat, heat as a form of energy that can flow, thermal equilibrium, and essence of form change .

After the treatment, profiles of students who understood the concept, did not understand the concept, and misconceptions on the temperature and heat topic for the experiment class and the control class are presented in Table 3.

Table 3. Percentage of understanding concepts, not understanding concepts, and misconceptions

Understanding (%)		Not Understanding (%)		Misconception (%)	
A	B	A	B	A	B
97	88	0	6	3	6

A: Experiment class B: Control class

Data in Table 3 show that the profile percentage average of students who the understanding of concept on the temperature and heat topic for the experiment class is higher than the control class. The application Edmodo learning media and conventional learning are be able to improve the classically of the students' understanding of concepts on the temperature and heat topic on the above the minimum completeness criteria, 75%. Conventional learning is being able to contribute to increasing students' understanding through learning methods and scenarios according to the student characteristics and subject matter. Furthermore, the application of the Edmodo learning media is superior in minimizing the occurrence of misconceptions on the temperature and heat topic than conventional learning. This is indicated by the profile of the student's percentage average that experienced the misconceptions for the experiment class smaller than the control class. This finding reinforces of the theory which states that misconceptions can be reduced but cannot be erased with certain learning models [6]. The result of research from [24] that the PhET simulation model by worksheets assisted can be used to remediate and minimize the misconception of prospective physics teacher on the electrical circuit topic; and [25] stated that students' failure in solving conceptual problems on the mechanical wave topic is due to misconceptions.

4. Conclusion

There are differences in the students' understanding on the temperature and heat topic between students who were learned with the Edmodo learning media and students who were learned with

conventional learning. The sstudents who were learned with the Edmodo learning media are superior in improving understanding of concepts and minimizee misconceptions than those the students who were learned with conventional learning. The Edmodo learning media is recommended to be applied to science learning in an effort to enrich the results of misconception research. In addition, the Edmodo learning media is also recommended for further research to test the consistency level of the previous findings in an effort to improve the quality of learning processes and outcomes in schools.

5. References

[1] Novak J D and Gowin D B 1984 *Learning How to Learn* (Cambridge: Cambridge University Press)
[2] Berg E V D 1991 *Miskonsepsi Fisika dan Remediasinya* (Salatiga: University Kristen Satya Wacana)
[3] Dahar R W 1989 *Teori-Teori Belajar* (Jakarta: Erlangga)
[4] Indrawati 1997 *Penggunaan Bridging Analogy untuk Remedi Beberapa Konsep Fisika Siswa SMA* Tesis Magister tidak dipublikasikan (Bandung: Program Pascasarjana IKIP Bandung)
[5] Prasetyo Z K 2001 *Kapita Selekta Pembelajaran Fisika* (Jakarta: Universitas Terbuka)
[6] Suparno P 2005 *Miskonsepsi dan Perubahan Konsep Pendidikan Fisika* (Jakarta: Gramedia Widiasarana Indonesia)
[7] Waldrip B and Rusdiana D 2012 Impact of Representational Approach on the Improvement of Students' Understanding of Acceleration *Jurnal Pendidikan Fisika Indonesia* **8** 2 161-173
[8] Trowbridge D E and McDermott L C 1980 Investigation of Student Understanding of the Concept of Velocity in One Dimension *American Journal of Physics* **48** 12 1020 -1028
[9] McDermott L C, Rosenquist M L and van Zee E H 1987 Student Difficulties in Connecting Graphs and Physics: Examples from Kinematics *American Journal of Physics* **55** 6 503 -513
[10] Halloun I B and Hestenes D 1985 The Initial Knowledge State of College Physics Students *American Journal of Physics* **53** 11 1043-1055
[11] Suparno P 1997 *Filsafat Konstruktivisme Dalam Pendidikan* (Yogyakarta: Kanisius)
[12] Daryanto dan Karim S 2016 *Pembelajaran Abad 21* (Malang: Gava Media)
[13] Pribadi B A 2017 *Media Dan Teknologi dalam Pembelajaran* (Jakarta: Kencana Prenada Media Group)
[14] Wena M 2009 *Strategi Pembelajaran Inovatif Kontemporer Suatu Tinjauan Konseptual Operasional* (Jakarta: Bumi Aksara)
[15] Mudlofir A dan Rusydiah E F 2017 *Desain Pembelajaran Inovatif Dari Teori ke Praktik* (Jakarta: Raja Gravindo Persada)
[16] Sugiono 2008 *Metode Penelitian Pendidikan; Pendekatan Kuantitatif, Kualitatif dan R & D* (Bandung: Alfabeta)
[17] Cohen L, Manion L and Morrison K 2002 *Research Methods in Education* (London and New York : Routledge)
[18] Hasan S, Bagayoko D and Kelley E L 1999 Misconception and The Certainty of Response Index (CRI) *Physical Education* **34** 5 294-299
[19] Potgieter M, Malatje E, Gaigher E and Venter E 2010 Confidence versus Performance as an Indicator of the Presence of Alternative Conceptions and Inadequate Problem-Solving Skills in Mechanics *International Journal of Science Education* **32** 11 1407-1429
[20] Hake R R 1998 Interactive Engagement versus Tradisional Methods: A Six Thousand Student Survey of Mechanics Test Data for Introductory Physics Course *American Journal of Physics* **66** 1 64-74
[21] Mursalin M 2014 Meminimalkan Miskonsepsi pada Materi Rangkaian Listrik dengan Pembelajaran Predict-Observe-Explain *Jurnal Ilmu Pendidikan* **20** 1 94-99
[22] Santoso B, Setiawan A and Rusli A 2007 Urutan Predict-Observe-Explain pada pembelajaran Fluida Dinamis untuk Meningkatkan Penguasaan Konsep dan Keterampilan Generik Siswa *Jurnal Penelitian Pendidikan IPA* **1** 3 247-257

[23] Driver R, Geusne E and Tiberghien A 1985 *The Development of Ideas with Teaching: Children's Ideas in Science* (Milton Keynes: Open University Press)
[24] Mursalin M 2013 Model Remediasi Miskonsepsi Materi Rangkaian Listrik dengan Pendekatan Simulasi PhET *Jurnal Pendidikan Fisika Indonesia* **9** 1 1-7
[25] Sutopo S 2016 Students' Understanding of Fundamenmtal Concepts of Mechanical Wave *Jurnal Pendidikan Fisika Indonesia* **12** 1 41-53

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