THE USE OF DRAW IO AS DIGITAL MIND MAP TO IMPROVE STUDENTS' CREATIVITY AND STUDENTS' CONCEPT MASTERY IN LEARNING HUMAN INFLUENCE ON ECOSYSTEM

RESEARCH PAPER

Submitted as Requirement to Obtain Degree of *Sarjana Pendidikan* in
International Program on Science Education (IPSE) Study Program

Arranged by:
Mohamad Yusril Aldiana Mahendra
1700583

INTERNATIONAL PROGRAM ON SCIENCE EDUCATION
FACULTY OF MATHEMATICS AND SCIENCE EDUCATION
UNIVERSITAS PENDIDIKAN INDONESIA
2021

THE USE OF DRAW IO AS DIGITAL MIND MAP TO IMPROVE STUDENTS' CREATIVITY AND STUDENTS' CONCEPT MASTERY IN LEARNING HUMAN INFLUENCE ON ECOSYSTEM

Skripsi ini diajukan untuk memenuhi salah satu syarat
memperoleh gelar Sarjana Pendidikan
pada Program Studi International Program on Science Education (IPSE)
Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

Mohamad Yusril Aldiana Mahendra
Universitas Pendidikan Indonesia
May 2021

APPROVAL SHEET

THE USE OF DRAW IO AS DIGITAL MIND MAP TO IMPROVE STUDENTS' CREATIVITY AND STUDENTS' CONCEPT MASTERY IN LEARNING HUMAN INFLUENCE ON ECOSYSTEM

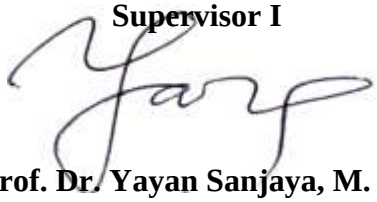
By:

Mohamad Yusril Aldiana Mahendra

1700583

Approved and Confirmed by:

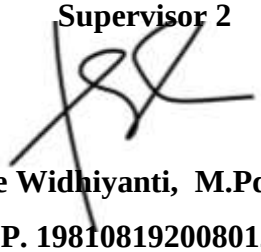
Supervisor I



Prof. Dr. Yayan Sanjaya, M. Si.

NIP. 197112312001121001

Supervisor 2

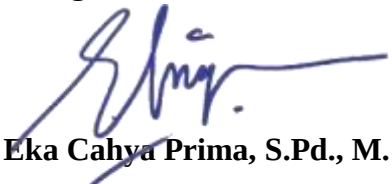


Tuszie Widhiyanti, M.Pd., Ph.D.

NIP. 198108192008012014

Perceived by,

Head of International Program on Science Education Study Program



Dr. Eka Cahya Prima, S.Pd., M. T.

NIP 19900626220240410001

DECLARATION

I do hereby declare that every aspect was written in this research paper entitled "The Use Of Draw IO As Digital Mind map To Improve Students' creativity And Students' Concept Mastery In Learning Human Influence On Ecosystem" is original result from my idea, efforts, and works without copying or plagiarizing from other papers. The theories, opinions, and other that contained in this paper have been quoted or referenced based on scientific code from UPI and accordance with scientific ethics that applies in scholarly society. This declaration is cretaed truthfully and mindful way unless it is eventually considered to be a violation of scientific ethics, or whether there is a statement by the other to authenticity of this research paper, I am able to accept the authorization of scholars or copyright is found. Hence, I am willing to responsible and accept academicals sanctions corresponds the rules.

Garut, 04 May 2021

Declarant,

Mohamad Yusril Aldiana Mahendra

1700583

ACKNOWLEDGEMENTS

The author praises gratitudes to Allah SWT for this Mercy so that the author can finished this research paper. In this occasion, the author would like to express this sincere gratitude and appreciation to the following:

1. Dr. Eka Cahya Prima, S.Pd., M.T. as the Head of International Progam on Science Education Study Program.
2. Prof. Dr. Yayan Sanjaya, M.Si. as my first supervisor who always gives me knowladge, guidance, and motivation all the time during finishing my Research paper.
3. Tuszie Widhiyanti, M.Pd., Ph.D. as my second supervisor for all the encouragement, full guidance, and motivation all the time during finishing my Research paper.
4. Eliyawati, M.Pd. as my academic supervisor and the expert judgements, who always giving the sharing, gives advice, motivating all the time during all the activity in the college from 2017 until finishing this research paper.
5. Ikmanda Nugraha, M. Pd. as the expert judgements for my research instrument, thank for all knowladge, guidance, and motivation during finishing this research paper.
6. All IPSE Lecturer, Laborant, and Administrator (Mrs Diana, Mrs Rika, Mrs Eli, Mrs Lilit, Mrs Margie, Mr Eka, Mr Nanang, Mr Ikmanda, Mr Latief, Mrs Resik, and Mrs Dhea) , thank you for your helping, supporting, guiding, and giving the knowladge to the author since 2017 until finishing this study.
7. Head master of SMP Al Irsyad Satya Islamic School for helping and facilitating the author during taking the data for this research paper.
8. All the science teachers in SMP Al Irsyad Satya Islamic School especially for Mr Rudi and Mrs Sarah, thankfull for the sharing, guidance, and motivation during teaching practicum and taking the data for this research.
9. All my families, mother, father, sisters, and brother who have prayed and encouraged the author in every phase of the time.

10. All IPSE 2017 students (Mia Wulansani, Miftah Ummi Hanifa, Salma Khoirotunnisa, Dhika Andraresti Lazuardi, Annisa Fadhila Nur Fikriah, Nur Shinta Ratna Wulan, Xavierina Dewi Endangsari Adiningsih, Arsanti Satriani Salim, Sulistinayah Suwaka Putri, Sofi Alfiani, Kamila Putri Nursyahbani, Raisha Nur Kanina, Syahida Ainnaya, Naufal Rabah Wahidin, Putri Sekar Melati, Erika Oktaviani, Tashya Alfiah Yasin, Tiara Syifanida, Shafa Rihadatul Aisy, Nadira Renata Putri, Rossy Andini Herindra Putri, Diana Ayu Latifah, and Novi Nursafitri) who always help, listen to through my difficult times and cheer me up.
11. Yako as my aunt who always help the researcher during finishing the research paper.
12. The IPSEboys (Hengky Kusniar, Naufal Rabah Wahidin, Mufti Muhammad Hamzah, Anazar Priatna, Mohammad Naufal Nursyabana, Muhammad Ihsan Fajar Syahid Muharram, Dicky Azi Nugraha, Rizky Maulana Shidiq, Muhammad Abby Farras, Muhammad Fahriza Amri, and Winata Tegar Saputra) who always gives the entertaiment during finishing the study.
13. All the members of BEM REMA UPI 2020 especially for Fatiha Khoirotunnisa Elfahmi, Suprayetno, Marlovin Bhadrika Harun, and all the member of Kementrian Sekretaris Kabinet BEM REMA UPI 2020 who always gives the motivation, supporting, and entertaining during finishing this research paper.

THE USE OF DRAW IO AS DIGITAL MIND MAP TO IMPROVE STUDENTS' CREATIVITY AND STUDENTS' CONCEPT MASTERY IN LEARNING HUMAN INFLUENCE ON ECOSYSTEM

Mohamad Yusril Aldiana Mahendra

International Program on Science Education

aldianamahendra23@gmail.com

ABSTRACT

The Covid-19 pandemic has significantly affected the education system worldwide. During this pandemic, teachers have a challenge to improve students' concept mastery and students' creativity through online learning. This research aims to determine the application of Draw IO as digital mind map to improve students' concept mastery and students' creativity. Draw IO is a diagram tools that is the most flexible in making flowchart process diagrams especially for mind mapping. This research using pre-experimental method with one group pre-test and post-test design in one of the private schools in Bandung Barat which use Cambridge Curricullum. There were 29 students of secondary 3 level who are participated on this research. Creativity was measured on four aspect which are fluency, flexibility, originality, and ellaboration. The result showed that most of the students still on moderate level which means that the creativity shows good enough quality. Meanwhile, the result about students' concept mastery was measured by cognitive test were showed the improvement with N-gain is 0.42 and categorized as medium improvement. The siginificancy value on the hypothesis test is less than 0.05. It indicates there are significant different in students' concept mastery on learning human influence on ecosystems by using Draw IO as digital mind map. Based on the result, Draw IO can be used as learning tools for improving students' concept mastery and students' creativity.

Keyword: Draw.IO as Digital Mind Map, Students Concept Mastery, Students' Creativity , and Human Influnce on Ecosystems

PENGGUNAAN DRAW IO SEBAGAI *MIND MAP* DIGITAL UNTUK MENINGKATKAN KREATIVITAS SISWA DAN PENGUASAAN KONSEP SISWA DALAM MEMPELAJARI PENGARUH MANUSIA TERHADAP EKOSISTEM

Mohamad Yusril Aldiana Mahendra

International Program on Science Education

aldianamahendra23@gmail.com

ABSTRAK

Pandemi Covid-19 telah secara signifikan memengaruhi sistem pendidikan di seluruh dunia. Selama pandemi ini, pengajar mendapat tantangan untuk meningkatkan penguasaan konsep dan kreativitas siswa melalui pembelajaran online. Penelitian ini bertujuan untuk mengetahui penerapan Draw IO sebagai *mind map* digital untuk meningkatkan penguasaan konsep dan kreativitas siswa. Draw IO adalah media yang paling fleksibel dalam membuat diagram terkhusus dalam pembuatan *mind map*. Penelitian ini menggunakan metode pre -ekperimen dengan *one group pre-test* dan *post-test* desain yang dilakukan di salah satu sekolah swasta di Bandung Barat yang menggunakan kurikulum Cambridge. Terdapat 29 siswa kelas 3 Sekolah Menengah Pertama yang berpartisipasi dalam penelitian ini. Kreativitas diukur pada empat aspek yaitu kefasihan, fleksibilitas, orisinalitas, dan elaborasi. Hasil penelitian menunjukkan bahwa kreativitas siswa masih berada pada tingkat sedang yang artinya kualitas sudah cukup baik. Sedangkan hasil belajar penguasaan konsep siswa yang diukur dengan tes kognitif menunjukkan peningkatan dengan *N-gain* 0,42 dan dikategorikan dalam peningkatan sedang. Nilai signifikansi pada uji hipotesis menunjukkan kurang dari 0,05. Hal ini menunjukkan bahwa terdapat perbedaan yang signifikan pada penguasaan konsep siswa dalam mempelajari pengaruh manusia terhadap ekosistem dengan menggunakan Draw IO sebagai *mind map* digital. Berdasarkan hasil tersebut, Draw IO dapat digunakan sebagai sarana pembelajaran untuk meningkatkan penguasaan konsep dan kreativitas siswa.

Keyword: Draw.IO sebagai Digital *Mind map*, Pemahaman Konsep Siswa, Kreativitas Siswa, dan Pengaruh Manusia terhadap Ekosistem

LIST OF CONTENTS

APPROVAL SHEET iii
DECLARATION iv
ACKNOWLEDGEMENTS v
ABSTRACT vii
LIST OF CONTENT ix
LIST OF TABLES xi
LIST OF FIGURES xiii
CHAPTER I - INTRODUCTION 1
1.1 Background 1
1.2 Research Problem 5
1.3 Research Question 5
1.4 Limitation of Problem 5
1.5 Research Objective 6
1.6 Research Benefits 6
1.7 Organization Structure of The Research 7
CHAPTER II - LITERATURE REVIEW 8
2.1 Students Concept Mastery 8
2.2 Students' Creativity 11
2.3 Mind Mapping 13
2.4 Integrated Science 16
2.5 Human Influence on Ecosystems 19
2.6 Relevant Research 22
CHAPTER III - RESEARCH METHODOLOGY 25
3.1 Research Method 25
3.2 Research Design 25
3.3 Population and Sampling 26
3.4 Operational Definition 26
3.5 Assumption 27
3.6 Hypothesis 27
3.7 Cognitive Aspect Test 28
3.8 Research InstrumentAnalysis Based on Validation 28
3.9 Research InstrumentAnalysis Based on Expert Judgments 35

3.10 Creativity Rubric 35
3.11 Data Analysis Technique 38
3.12 Research Procedure 39
CHAPTER IV - RESULT AND DISCUSSION 42
4.1 Mind map Result based on Creativity Rubric 42
4.2 Students Mind Map Result 55
4.3 Draw IO for Students' Creativity 61
4.4 Students' Concept Mastery Result Based on Cognitive Test 62
4.5 Draw IO for Students Concept Mastery 68
4.6 Draw IO Implementation based on Lesson Plan 70
CHAPTER V CONCLUSION, IMPLICATION, AND RECOMMENDATION 74
5.1 Conclusion 74
5.2 Implication 74
5.3 Recommendation 75
REFERENCES 77
APPENDIX A 82
A.1 Research Instrument 83
A.2 Judgments Form 100
A.3 Students Validity Result 104
APPENDIX B 112
B.1 Lesson Plan 113
B.2 Draw IO 126
APPENDIX C 128
C.1 Cognitive Test Result 129
C.2 Students Mind Map Result 132
C.3 Students' Creativity Assesment 138
APPENDIX D 141
D.1 Administration Letter from Prodi 142
D.2 Administration from Faculty 144
APPENDIX E 145
E.1 Documentation 146
E.2 Research Paper Review Form 147
E.3 Autobiography 149

LIST OF TABLES

Table 2.1 The Cognitive Dimension.....8
Table 2.2 The Revised of Bloom Taxonomy.....9
Table 2.3 Cognitive Process Dimension Revised.....10
Table 2.4 Placement in Bloom Taxonomy.....11
Table 2.5 Relationship Creativity vs Mind map.....12
Table 2.6 Integrated Science Model.....17
Table 3.1 Pre and Post Test Design.....25
Table 3.2 Blue Print Cognitive Test.....28
Table 3.3 Validity Score.....29
Table 3.4 Validity Interpretation.....30
Table 3.5 Validation Result.....30
Table 3.6 Realibility Data.....32
Table 3.7 Realibility Result.....33
Table 3.8 Reliability Interpretation.....33
Table 3.9 Difficulity Interpretation 34
Table 3.10 Difficulty Level Result.....34
Table 3.11 List of Expert Judgements.....35
Table 3.12 Creativity Rubric.....36
Table 3.13 Score Percentage Criteria.....38
Table 4.1 Students Mind Map Result.....55
Table 4.2 Draw IO for Students' creativity.....61
Table 4.3 Descriptive Statistic Analysis Result.....63
Table 4.4 Normality Test Analysis Result.....64
Table 4.5 Paired Sample t Test Analysis Result.....65
Table 4.6 Homogeinity Variance Test Result.....66
Table 4.7 Independent Sample t Test Result.....67
Table 4.8 Draw IO for Students' Concept Mastery Result.....68
Table 4.9 Result of n Gain for each Class.....69
Table 4.10 Implementation Result Meeting 1.....70
Table 4.11 Implementation Result Meeting 2.....71

Table 4.12 Implementation Result Meeting 3.....71
Table 4.13 Implementation Result Meeting 4.....72

LIST OF FIGURES

Figure 2.1 Mind map on Draw IO.....14
Figure 2.1 Example of The Result Mind map on Draw IO.....15
Figure 4.1 Percentage of Central Idea Score.....44
Figure 4.2 Percentage of Keywords.....45
Figure 4.3 Percentage of Spelling Error.....46
Figure 4.4 Percentage of Colors Score.....46
Figure 4.5 Percentage of Branches Score.....47
Figure 4.6 Percentage of Basic Ordering Ideas Score.....48
Figure 4.7 Percentage of Quantity of Branches Score.....49
Figure 4.8 Percentage of Connected Words Score.....50
Figure 4.9 Percentage of Illustration Score.....51
Figure 4.10 Percentage of Emphasize Score.....52
Figure 4.11 Percentage of Hierarchy of the Level Score.....53
Figure 4.12 Percentage of Hierarchy of the Relationship Score.....53

REFERENCES

Adodo, S. O. (2013). Effect of Mind-Mapping as a Self-Regulated Learning Strategy on Students'. *Mediterranean Journal of Social Sciences, 6*(4). doi:10.5901/mjss.2013.v4n6p163

Arikunto, S. (2013). *Dasar-dasar Evaluasi Pendidikan.* Jakarta: PT Bumi Aksara.

Bloom, B. S. (1956). *Taxonomy of Educational Objectives: The Classificaton of Educational Goals.* New York: David McKay.

Bruno Poellhuber, N. R. (2020). A MOOC Quality Scale: Validation and Experimentation in a Pre Experimental Design. *Research Gate*.

C. Poluakan, A. F. (2019). Implementation of the Revised Bloom Taxonomy in Assesment of Physics Learning. *academia.edu, 4*(2).

Camano, D. A. (2019, July 2). Promoting Social Creativity in Science Education with Digital Technology to Overcome Inequaties: A Literature Review. *Frontiers in Psychology*, 1474. doi:https://doi.org/10.3389/fpsyg.2019.01474

Coutinho', E. (2014). Concept Maps: Evaluation Models for Educators. *Journal of Business and Management Sciences, 2*(5), 111-117. doi:10.12691/jbms-2-5-4

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (4th edition).*

D Astriani, H. S. (2020, March 27). Mind Mapping in Learning Model: A Tool to Improve Student Metacognitive Skills. *International Journal of Emerging Technologies in Learning (iJET), 16*(6).

D G Mackean, D. H. (2014). *Cambridge IGSCE Biology Third Edition.* London : Hodder Education An Hachette UK Company.

Daniel B Hajovsky, S. R. (2020). The Role of Teacher Self-Efficacy Beliefs in the Development of Teacher-Students Relationship. *Journal of School Psychology*, 141-158.

Deshpande, N. M. (2020). Impact of Globalization on Higher Education in this 21st Century. *UGC CARE Journal*, 174-183.

E Handayani Tyas, S. L. (2020). Building Superior Human Resources through

Character Education. *Research Gate*, 11864-11873.

Fardhila, R. R., & Istiyono, E. (2019). An assessment instrument of mind map product to assess students' creative thinking skill. *REiD (Research and Evaluation in Education), 5*(1), 41-53.

Fatmawati, B. (2016, October). THE ANALYSIS OF STUDENTS' CREATIVE THINKING ABILITY USING. *Jurnal Pendidikan IPA Indonesia, 5*(2), 216-221. doi:10.15294/jpii.v5i2.5825

Fraenkel, J. R. (2011). *How to design and evaluate research in education.* Newyork: McGraw-Hill Humanities/Social Sciences/Languages.

Gerald, B. (2018). A brief review of independent, dependent and one sample t-test. *International Journal of Applied Mathematics*, *2*(1), 345.

Gordon B., E. W. (1993). *Statistical Reasoning in Psychology and Education.* Toronto.

Guven, C. (2020). Analysis of Fifth Grade Science Learning Outcomes and Exam Question According to Revised Bloom Taxonomy. *Journal of Educational Issue, 5*(18), 58-69.

Ibrohim, S. M. (2020). Implementation of Inquary Based Learning (IBL) To Improve Students Understanding of Nature of Science (NOS). *AIP Conference Proceedings*.

Kim, Y. J. (2017). ANOVA and the variance homogeneity assumption: Exploring a better gatekeeper. *British Journal of Mathematical and Statistical Psychology*.

King, B. M. (1993). *Statistical Reasoning in Psychology and Education.* California: John Wiley & Son.

King, B. M. (1993). *Statistical Reasoning in Psychology and Education.* Toronto Canada.

Klein, L. I. (2021, March 11). Studying physics during the COVID-19 pandemic: Student assessments. *PHYSICAL REVIEW PHYSICS EDUCATION RESEARCH, 17*(1), 17.

Krathwohl, D. R. (2002, June 24). A Revision of Bloom Taxonomy: An Overview. Theory into Practice. *41*(4), 212-218.

doi:https://doi.org/10.1207/s15430421tip4104_2

Krischle, M., & Cate, I. M.-t. (2019, February 25). Pre- and in-Service Teachers Attitudes Towards Students with Learning Difficulties and Challenging Behaviour. *Frontiers in Psychology*, 327. doi:https://doi.org/10.3389/fpsyg.2019.00327

Lamanauskas, D. N. (2010). *European Dimension in Science Education.* Olomouc.

Lazuardini, D. A. (2019, October 13). Optimizing Senior High School Students Creative Thinking Skills of Optical Devices through Inductive Learning Models Assisted by e-Mind Map. *Journal of Physics : Conference Series*, *1233*, 279.

Mariana, H. (2021, April 01). The Effectiveness of Flipped Classroom to Improve Students' Concept Understanding and Self Efficacy during the Covid-19 Pandemic. *Journal of Biology Education, 10*(1). doi:https://doi.org/10.15294/jbe.v10i1.45190

Methodology, B. R. (2020). *Convinience Sampling*. Diambil kembali dari reseachmethodology.net: https://research-methodology.net/sampling-in-primary-data-collection/convenience-sampling/

Muhlisin, A. (2019, June 27). Reading, Mind-Mapping, and Sharing (RMS): Innovation of New Learning Model on Science Lecturer to Improve Understanding Concepts. *Journal for the Education of Gifted Young Scientist, 7*(2), 323-340. doi:https://doi.org/10.17478/jegys.570501

Myers, J. S. (2019). Measuring Outcomes in Quality Improvement Education: Succsess is in the Eye of the Beholder. *BMJ Quality and Safety, 28*(5), 345-348.

Negar Moradian, H. D. (2020). The Urgent Need for Integrated Science to Fight COVID-19 Pandemic and Beyond. *Journal of Translational Medicine*, 205.

O Polat, E. A. (2020). The Effect of Mind Mapping on Young Childrens's Critical Thinking Skills. *Thinking Skills and Creativity, 38*(2). doi:https://doi.org/10.1016/j.tsc.2020.100743

Oksuhong, J. S. (2020, September). A Componential Model of Science Classroom Creativity (SSC) for Understanding Collective Creativity in the Science Classroom. *Thinking Skills and Creativity, 37*(7), 234-256. doi:https://doi.org/10.1016/j.tsc.2020.100698

Poellhuber, N. R. (2020). A MOOC Quality Scale: Validation and Experimentation in a Pre Experimental Design. *Research Gate*.

Prabhaker M, C. M. (2019, January). Descriptive Statistics and Normality Tests for Statistical Data. *Ann Card Anaesth, 22*(1), 67-72. doi:10.4103/aca.ACA_157_18

Rahayu, P. (2018, April 29). Development of Creative Mind Map Rubric to Assess Creative Thinking Skills in Biology for the Concep of Enviromental Changes. *International Journal of Innovation and Research in Educational Sciences, 5*(2), 2349–5219.

Ridlo, Z. R. (2019, November 16). The implementation of project-based learning in STEM activity (water filtration system) in improving creative thinking skill. *Journal of Physics : Conference Series, 1563*.

Rosba, E. (2020). Digital Mind Map Assisted Group Investigation Learning for College Students' Creativity. *International Journal of Interactive Mobile Technologies, 15*(5), 23.

Showalter. (1975). Rationale for unbounded science curriculum. *School Science and Mathematic, 75*(1), 15-21. doi:https://doi.org/10.1111/j.1949-8594.1975.tb09006.x

Shtulman, C. W. (2020). Developing an Understanding of Science. *Annual Review of Developmental Psychology, 5*(8), 177-186.

Simone M. Ritter, X. G. (2020). Fostering Students Creative Thinking Skills by Means of a one Years Creaivity Training Program. *PLOS ONE*.

Smith, D. M. (2018). *Statistical Analysis.* Edinburgh, Scotland: The Winchelsea Press, Drumlin Security Ltd, Edinburgh.

Srimuliati. (2020). Kemampuan Sintesis Siswa Dalam Pembelajaran Matematika Melalui Model Pembelajaran AIR (Auditory, Intellectually, and Repetition) di SMA Negeri 3 Kejuruan Muda. *Al Khawarizmi : Jurnal*

Pendidikan dan Pembelajaran Matematika, 4(1), 77-86. Dipetik Juni 2020

Sunarto, E. H. (2021, March 30). Building Superior Human Resources through Character Education. *Research Gate*, 11864-11873.

Susianna, N. (2013). Development of Mind Map Rubric to Measure Creativity of Students in Basic Chemistry Course for the Concept of "Material and Its Changes". *Fifth International Conference on Science and Mathematics Education, 5*(2), 2349-5219.

Suyidno, E. S. (2019). Increasing Students Responsibility and Scientific Creativity through Creative Responsibility Based Learning. *Jurnal Peneltian Fisika dan Aplikasinya, 9*(2), 178-188. doi:http://dx.doi.org/10.26740/jpfa.v9n2.p147-157

Wa Malmia, S. H. (2019). Problem Based Learning as an Effort to Improve Students Learning Outcomes. *International Journal of Scientific and Technology Research*, 1140-1143.

Wamalmia, S. H. (2019, September). Problem Based Learning as an Effort to Improve Students Learning Outcomes. *International Journal of Scientific and Technology Research, 8*(09), 1140-1143.

Wang, S.-H. (2020, January 7). Instruction Design and Strategy of Concept Mapping. *5th International Conference on Economics, Management, Law, and Education, 10*, 111-120. doi:https://doi.org/10.2991/aebmr.k.191225.236

Zubaidah, S. (2017, December 15). Improving Creative Thinking Skills of Students through Differentiated Science Inquiry Integrated with Mind Map. *Journal of Turkish Science Education, 14*(4), 175.

Zukhrufurrohmah, R. N. (2020). The Effectiveness of Problem Based Learning in Terms of Creativity and Learning Outcomes. *MEJ (Mathematics Education Journal), 4*(2). doi: https://doi.org/10.22219/mej.v4i2.12277