

**STUDENTS' CREATIVITY AND CONCEPT MASTERY THROUGH THE USE
OF STEAM BASED LEARNING IN HEAT TRANSFER TOPIC**

RESEARCH PAPER

Submitted as Requirement to Obtain Degree of *Sarjana Pendidikan* in International
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**INTERNATIONAL PROGRAM ON SCIENCE EDUCATION
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ABSTRACT

Creativity is one of the 21st century skill that are important for students to compete a global competition in this globalization era. Creativity can be taught through the learning activities that help them develop fresh and useful ideas to solve various problems in life. However, learning activities cannot be separated from the idea of mastering the concept. In Indonesia, teachers tend to rely on traditional teaching methods, resulting in students who lack of innovation and conceptual understanding. One of the expected way to tackle that problems is by using STEAM based learning. This study aims to investigate students' creativity and concept mastery in learning heat transfer topic through the use of STEAM based learning. The pre-experimental with one group pre-posttest design was used in this study. The participants were 21 8th grade students from one class of private junior high school in Bandung, Indonesia. This research was implemented in online learning. Students' creativity was assessed from their creative product with CPAM rubric. The results showed that the students' creativity is at the good level with a percentage of 78.36%. Meanwhile, students' concept mastery was measured by using objective test which then analyzed with Wilcoxon S-R Test and N-gain. The result indicates a significant difference on students' concept mastery with the value of 0.00 at 5% level of significance. The improvement of students' concept mastery obtained 0.70 which categorized as medium improvement. STEAM based learning can be used to stimulate students' creativity and concept mastery in learning heat transfer topic.

Keywords: *STEAM based learning, Creativity, Concept mastery, Heat transfer*

**KREATIFITAS DAN PENGUASAAN KONSEP SISWA DENGAN
MENGGUNAKAN PEMBELAJARAN BERBASIS STEAM PADA TOPIK
PERPINDAHAN KALOR**

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ABSTRAK

Kreatifitas adalah salah satu keterampilan abad ke-21 yang sangat penting bagi siswa untuk bersaing dalam persaingan global. Kreatifitas dapat diajarkan dalam kegiatan belajar yang memungkinkan mereka untuk menghasilkan ide-ide baru dan berguna dalam memecahkan berbagai masalah dalam hidup. Namun, kegiatan pembelajaran tidak terlepas dari gagasan penguasaan konsep. Di Indonesia, guru-guru masih mengandalkan metode pengajaran tradisional, sehingga mengakibatkan siswa kurang kreatif dan kurang dalam pemahaman konseptual. Salah satu cara yang diharapkan dapat mengatasi masalah itu adalah dengan menggunakan pembelajaran berbasis STEAM. Penelitian ini bertujuan untuk mengetahui kreatifitas dan penguasaan konsep siswa dalam mempelajari topik perpindahan kalor dengan menggunakan pembelajaran berbasis STEAM. Penelitian ini menggunakan metode pre-experimental dengan desain one group pre-posttest. Partisipan terdiri dari 21 siswa kelas delapan dari salah satu kelas di sekolah SMP swasta di Bandung, Indonesia. Penelitian ini dilaksanakan dalam pembelajaran daring. Kreativitas siswa dinilai dari produk kreatif yang mereka buat dengan rubrik CPAM. Hasil penelitian menunjukkan bahwa tingkat kreatifitas siswa berada di tingkat yang baik dengan presentasenya 76.98%. Sementara itu, penguasaan konsep siswa diukur dengan menggunakan tes item yang kemudian dianalisis dengan Wilcoxon S-R Test dan N-gain. Hasilnya menunjukkan bahwa terdapat perubahan yang signifikan pada penguasaan konsep siswa dengan nilai 0.00 pada taraf signifikansi 5%. Peningkatan penguasaan konsep siswa diperoleh 0.70 yang termasuk dalam kategori peningkatan sedang. Pembelajaran berbasis STEAM dapat digunakan untuk mendukung kreatifitas dan penguasaan konsep siswa dalam mempelajari topik perpindahan kalor.

Keyword: *Pembelajaran berbasis STEAM, Kreatifitas, Penguasaan konsep, Perpindahan kalor*

LIST OF CONTENTS

APPROVAL SHEET	iii
DECLARATION	iv
ACKNOWLEDGEMENT.....	v
ABSTRACT	vii
LIST OF CONTENTS	ix
LIST OF TABLES.....	xi
LIST OF FIGURES	xii
LIST OF APPENDIXES.....	xiii
CHAPTER I INTRODUCTION.....	14
1.1 Background	14
1.2 Research Problem.....	18
1.3 Research Question	18
1.4 Research Limitation.....	18
1.5 Research Objectives.....	19
1.6 Research Benefit.....	19
1.7 Organizational Structure of Research Paper	19
CHAPTER II LITERATURE REVIEW	21
2.1 Students' Creativity	21
2.2 Students' Concept Mastery	23
2.3 Science, Technology, Engineering, Arts, Mathematics (STEAM).....	25
2.4 Heat Transfer.....	27
2.5 Relevant Research	32
CHAPTER III RESEARCH METHODOLOGY	35
3.1 Research Method	35
3.2 Research Design	35
3.3 Classroom Treatment.....	36
3.4 Population and Sampling	36
3.5 Operational Definition	37
3.6 Assumption	38
3.7 Hypothesis.....	38

3.8	Research Instrument	38
3.9	Data Analysis Technique	47
3.10	Research Procedure	49
CHAPTER IV RESULT AND DISCUSSION.....		53
4.1	The Implementation of STEAM based learning.....	53
4.2	Students Creativity	60
4.2.1	Creativity in each dimension	63
4.2.2	Creativity dimension in each group	66
4.3	Students' Concept Mastery	68
4.3.1	Hypothesis Analysis of Students' Concept Mastery	68
4.3.2	Recapitulation Hypothesis Test of Students' Concept Mastery.....	71
4.4	The Improvement of Students' Concept Mastery.....	72
CHAPTER V CONCLUSION, IMPLICATION, AND RECOMMENDATION.....		77
5.1	Conclusion	77
5.2	Implication	78
5.3	Recommendation	78
REFERENCES		79
APPENDIX		87
AUTOBIOGRAPHY		139

LIST OF TABLES

Table 3.1 One Group Pre-test Post-test Design	35
Table 3.2 The Learning Activities and Each Stage of STEAM-PjBL	36
Table 3.3 Objective Test of Heat Transfer Topic	39
Table 3.4 The Interpretation of Validity Value	39
Table 3.5 The Interpretation Value of Reliability.....	40
Table 3.6 Interpretation Value of Difficulty Level	40
Table 3.7 Discriminating Power	41
Table 3.8 Recapitulation Analysis Objective Test.....	43
Table 3.9 The Creative Product Analysis Matrix (CPAM) Design	44
Table 3.10 STEAM-PjBL Observation Sheet	45
Table 3.11 The Interpretation of Learning Experiences Implementation	46
Table 3.12 N-gain Interpretation	47
Table 3.13 The Interpretation of Effect Size (r) Value	49
Table 3.14 The Interpretation of Students' Creativity	49
Table 4.1 STEAM-PjBL Observation Sheet	58
Table 4.2 The Implication of STEAM in Project Creation	60
Table 4.3 Students' Creativity Dimension Result	62
Table 4.4 Students' Creativity for Each Dimension	64
Table 4.5 The Category of Students' Creativity for Each Group	67
Table 4.6 Test of Normality of Pre-test and Post-test Students' Concept Mastery	69
Table 4.7 The Homogeneity Test of Pre-test and Post-test	70
Table 4.8 The Result of Wilcoxon Test of Pre-test & Post-test Students' Concept Mastery.....	71
Table 4.9 Recapitulation Hypothesis Analysis of Students' Concept Mastery	71
Table 4.10 Gain Value and N-gain from Pre-test to Post-test	73
Table 4.11 The Recapitulation of Students' Cognitive Domain	74

LIST OF FIGURES

Figure 2.1 Heat Transfer between Areas at Temperatures T1 and T2	28
Figure 2.2 A Pan of Boiling Water Sits On a Stove Burner	29
Figure 2.3 Convection Currents from Heater	29
Figure 2.4 The Sun Radiates Electromagnetic Radiation.....	30
Figure 2.5 The Particles Movement during Evaporation	31
Figure 2.6 Thermos Flask.....	32
Figure 3.1 Flowchart of Research Procedures	52
Figure 4.1 Student's Answer after Analyzing the Problems in the Worksheet	54
Figure 4.2 Thermos Design in Students Worksheet.....	55
Figure 4.3 Group Discussion at the Implementation Stage	56
Figure 4.4 Product Testing to Check Their Device Workability	56
Figure 4.5 A Students from Group 3 Present Their Product	57
Figure 4.6 Students Creativity Products.....	61
Figure 4.7 Students Creativity Products.....	61
Figure 4.8 Students' Creativity in Each Dimension	64
Figure 4.9 Creativity Dimension for Each Group.....	66
Figure 4.10 Students' Concept Mastery from Pre-test to Post-test	72

LIST OF APPENDICES

APPENDIX A RESEARCH INSTRUMENT	88
Appendix A.1 Objective Test	89
Appendix A.1.1 Initial Objective Test	89
Appendix A.1.2 Final Objective Test	97
Appendix A.2 CPAM Rubric	104
Appendix A.3 Validation Form	108
Appendix A.3.1 IPSE Lecturer	108
Appendix A.3.2 Science Teacher	110
Appendix A.3.3 Students Validity Result	112
Appendix A.3.3.1 Reliability	112
Appendix A.3.3.2 Validity	113
Appendix A.3.3.3 Difficulty Level	114
Appendix A.3.3.4 Distractor	115
Appendix A.3.3.5 Discrimination Power	116
APPENDIX B INSTRUCTIONAL TOOLS	117
Appendix B.1 Lesson Plan	118
Appendix B.2 Students' STEAM Worksheet	124
APPENDIX C RESEARCH DATA RESULT	131
Appendix C.1 Students' Creativity Result	132
Appendix C.2 Students' Concept Mastery Result	134
APPENDIX D DOCUMENTATION	136

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