

**PENERAPAN STRATEGI PEMBELAJARAN METAKOGNITIF DALAM  
PENDEKATAN SAINTIFIK TERHADAP PENINGKATAN KETERAMPILAN  
BERPIKIR KRITIS DAN PENGETAHUAN METAKOGNITIF PESERTA  
DIDIK SMA PADA KONSEP KALOR**

**TESIS**

diajukan sebagai syarat untuk memperoleh gelar Magister Pendidikan Program Studi  
Pendidikan Fisika



oleh

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**PROGRAM STUDI MAGISTER PENDIDIKAN FISIKA  
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM  
UNIVERSITAS PENDIDIKAN INDONESIA  
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2024**

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TESIS

Oleh

Siska Dewi Aryani

Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar  
Magister Pendidikan pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan  
Alam

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## LEMBAR PENGESAHAN TESIS

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## **PERNYATAAN**

Dengan ini saya menyatakan bahwa tesis dengan judul “Penerapan Strategi Pembelajaran Metakognitif Dalam Pendekatan Saintifik Terhadap Peningkatan Keterampilan Berpikir Kritis Dan Pengetahuan Metakognitif Peserta Didik SMA Pada Konsep Kalor” ini beserta isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

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## **KATA PENGANTAR**

*Bismillahirrahmanirrahim*, segala puji Syukur penulis haturkan kehadiran Allah SWT atas segala limpahan Rahmah dan hidayah-Nya, sehingga penulis dapat menyelesaikan tesis yang berjudul “Penerapan Strategi Pembelajaran Metakognitif dalam Pendekatan Saintifik terhadap Peningkatan Keterampilan Berpikir Kritis dan Pengetahuan Metakognitif Peserta Didik SMA pada Konsep Kalor”. Dalam tesis ini dibahas mengenai hasil dari penerapan strategi pembelajaran metakognitif dalam pendekatan saintifik terhadap peningkatan keterampilan berpikir kritis dan pengetahuan metakognitif peserta didik SMA pada konsep kalor. Tujuan penulisan tesis ini adalah untuk memenuhi salah satu syarat memperoleh gelar magister (M.Pd) Program Studi Pendidikan Fisika Universitas Pendidikan Indonesia.

Penyusunan tesis ini tidak terlepas dari hambatan yang penulis alami, namun berkat bantuan, dorongan, serta bimbingan dari berbagai pihak, akhirnya tesis ini dapat diselesaikan dengan baik. Penulis beranggapan bahwa tesis ini merupakan karya ilmiah terbaik yang dapat dipersembahkan. Namun penulis menyadari tidak menutup kemungkinan terdapat kekurangan. Oleh karena itu, penulis mengharapkan aanya kritik dan saran yang mendukung untuk penelitian berikutnya. Semoga tesis ini dapat bermanfaat bagi penulis dan bagi pembaca pada umumnya.

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**ABSTRAK**

Strategi pembelajaran metakognitif dalam pendekatan saintifik tidak hanya memfasilitasi peserta didik menguasai konsep-konsep ilmiah tetapi dapat melatih keterampilan berpikir kritis dan pengetahuan metakognitif sehingga menjadi pembelajar yang sadar dan mampu berpikir tingkat tinggi sesuai dengan tuntutan pendidikan abad-21. Penelitian ini bertujuan untuk mengungkap peningkatan keterampilan berpikir kritis dan pengetahuan metakognitif, pengaruh strategi pembelajaran metakognitif dalam pendekatan saintifik terhadap peningkatan keterampilan berpikir kritis dan pengetahuan metakognitif, hubungan keterampilan berpikir kritis dan pengetahuan metakognitif. Penelitian ini menggunakan metode *Quasi-Experimental* dengan desain penelitian yaitu *posttest-pretest design, Non-equivalent Control Group Design*. Instrumen penelitian yang digunakan adalah soal essay keterampilan berpikir kritis dan kuesioner pengetahuan metakognitif. Data dianalisis menggunakan *software* SPSS, WIDSTEP, dan Ms. Excel. Peningkatan keterampilan berpikir kritis pada kelas eksperimen menunjukkan N-Gain sebesar 0,76 (kategori tinggi) dan pada kelas kontrol sebesar 0,49 pada (kategori sedang) serta uji Mann-Whitney diperoleh nilai Sig, (2-tailed)  $<0,05$  dengan *effect size* 1,038 (kategori sangat besar). Hal ini menunjukkan ada perbedaan yang signifikan peserta didik yang penerapan strategi pembelajaran metakognitif dan peserta didik tanpa menerapkan strategi pembelajaran metakognitif terhadap peningkatan keterampilan berpikir kritis. Sedangkan peningkatan pengetahuan metakognitif pada kelas eksperimen menunjukkan N-Gain sebesar 0,63 (kategori sedang) dan kelas kontrol sebesar 0,31 pada kategori (sedang) serta uji Mann-Whitney diperoleh nilai Sig, (2-tailed)  $<0,05$  dengan *effect size* 2,256 pada kategori sangat besar. Hal ini menunjukkan ada perbedaan yang signifikan peserta didik yang penerapan strategi pembelajaran metakognitif dan peserta didik tanpa menerapkan strategi pembelajaran metakognitif terhadap peningkatan pengetahuan metakognitif. Hasil uji korelasi rank spearman kelas eksperimen menunjukkan adanya hubungan yang kuat kedua variabel, dan pada kelas kontrol menunjukkan tidak ada korelasi yang kuat antara kedua variabel, Penelitian berikutnya dapat mengembangkan LKPD berbasis metakognisi dengan multimedia yang lebih mengeksplorasi pemecahan masalah peserta didik.

Kata kunci: Strategi Pembelajaran Metakognitif, Pendekatan Saintifik, Keterampilan Berpikir Kritis, Pengetahuan Metakognitif, Konsep Kalor.



**APPLICATION OF METACOGNITIVE LEARNING STRATEGIES IN A  
SCIENTIFIC APPROACH TO IMPROVING CRITICAL THINKING  
SKILLS AND METACOGNITIVE KNOWLEDGE OF HIGH SCHOOL  
STUDENTS ON THE CONCEPT OF HEAT**

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**ABSTRACT**

Metacognitive learning strategies in the scientific approach not only facilitate students to master scientific concepts but can train critical thinking skills and metacognitive knowledge so that they become learners who are aware and able to think at a high level in accordance with the demands of 21st century education. This study aims to reveal the improvement of critical thinking skills and metacognitive knowledge, the effect of metacognitive learning strategies in the scientific approach on improving critical thinking skills and metacognitive knowledge, the relationship between critical thinking skills and metacognitive knowledge. This study uses the Quasi-Experimental method with a research design, namely posttest-pretest design, Non-equivalent Control Group Design. The research instruments used were critical thinking skills essay questions and metacognitive knowledge questionnaires. Data were analyzed using SPSS, WIDSTEP, and Ms. Excel software. The increase in critical thinking skills in the experimental class showed an N-Gain of 0.76 (high category) and in the control class of 0.49 in (medium category) and the Mann-Whitney test obtained a Sig value, (2-tailed)  $<0.05$  with an effect size of 1.038 (very large category). This shows that there is a significant difference between students who apply metacognitive learning strategies and students without applying metacognitive learning strategies towards improving critical thinking skills. While the increase in metacognitive knowledge in the experimental class showed an N-Gain of 0.63 (medium category) and the control class of 0.31 in the (medium) category and the Mann-Whitney test obtained a Sig value, (2-tailed)  $<0.05$  with an effect size of 2.256 in the very large category. This shows that there is a significant difference between students who apply metacognitive learning strategies and students without applying metacognitive learning strategies towards improving metacognitive knowledge. The results of the Spearman rank correlation test in the experimental class showed a strong relationship between the two variables, and in the control class there was no strong correlation between the two variables. Further research can develop metacognition-based LKPD with multimedia that further explores students' problem solving.

Keywords: Metacognitive Learning Strategies, Scientific Approach, Critical Thinking Skills, Metacognitive Knowledge, Heat Concepts.

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