

ABSTRACT

Muhammad Jamhari. The Effects of Visual Mapping and Science-Related Attitudes on Students' Critical Thinking and Problem Solving Skills at MAN 1 Tanjung Pura. Thesis: Postgraduate Program of Biology Education, Universitas Negeri Medan, 2018.

The aims of this study were to find out: (1) the effects of learning techniques on students' critical thinking skills, (2) the effects of science-related attitudes on students' critical thinking skills, (3) the interactions between learning techniques and science-related attitudes on students' critical thinking skills, (4) the effects of learning techniques on students' problem solving skills, (5) the effects of science-related attitudes on students' problem solving skills, and (6) the interactions between learning techniques and science-related attitudes on students' problem solving skills. This study was conducted at MAN 1 Tanjung Pura, with the samples of 141 students of XI-Science Program. This study was a quasi-experimental technique by using a pretest-posttest experimental group with 4x2 factorial design. The technique of data analysis was processed by the Two-Way ANOVA and followed by Duncan's Multiple Range Test with the aid of SPSS 22.00 on the significance level of 0.05. The results showed that: (1) there were the significant effects of learning techniques on students' critical thinking skills (CTS) ($F=87.082$; $P=0.000$), where the scores of students' CTS taught by argument mapping (86.83 ± 2.478) were significantly higher than taught by direct instruction (78.03 ± 2.658), (2) there were the significant effects of science-related attitudes (SRA) on students' critical thinking skills (CTS) ($F=2.493$; $P=0.040$), where the scores of high SRA on students' CTS taught by learning techniques (85.00 ± 4.401) were significantly higher than the scores of low SRA on students' CTS taught by learning techniques (74.93 ± 3.254), (3) there were the interactions between learning techniques and SRA on students' CTS ($F=2.037$; $P=0.000$), where the scores of students' CTS taught by mind mapping with high SRA were significantly different than taught by direct instruction with high SRA ($P=0.031<0.05$) and low SRA ($P=0.000<0.05$), (4) there were the significant effects of learning techniques on students' problem solving skills (PSS) ($F=94.214$; $P=0.000$), where the scores of students' PSS taught by concept mapping (87.74 ± 2.586) were significantly higher than taught by direct instruction (78.84 ± 2.689), (5) there were the significant effects of SRA on students' PSS ($F=3.397$; $P=0.031$), where the scores of high SRA on students' PSS taught by learning techniques (85.68 ± 4.312) were significantly higher than the scores of low SRA on students' PSS taught by learning techniques (77.26 ± 3.614), and (6) there were the interactions between learning techniques and science-related attitudes on students' problem solving skills ($F=2.195$; $P=0.000$), where the scores of students' PSS taught by argument mapping with high SRA were significantly different than taught by direct instruction with high SRA ($P=0.042<0.05$) and low SRA ($P=0.000<0.05$).

Keywords: Learning Techniques, Science-Related Attitudes, Critical Thinking Skills, Problem Solving Skills

ABSTRAK

Muhammad Jamhari. The Effects of Visual Mapping and Science-Related Attitudes on Students' Critical Thinking and Problem Solving Skills at MAN 1 Tanjung Pura. Tesis: Program Pascasarjana Pendidikan Biologi, Universitas Negeri Medan, 2018.

Tujuan penelitian ini adalah untuk mengetahui: (1) pengaruh teknik pembelajaran terhadap kemampuan berpikir kritis siswa, (2) pengaruh sikap ilmiah terhadap kemampuan berpikir kritis siswa, (3) interaksi antara teknik pembelajaran dan sikap ilmiah terhadap kemampuan berpikir kritis siswa, (4) pengaruh teknik pembelajaran terhadap kemampuan pemecahan masalah siswa, (5) pengaruh sikap ilmiah terhadap kemampuan pemecahan masalah siswa, dan (6) interaksi antara teknik pembelajaran dan sikap ilmiah terhadap kemampuan pemecahan masalah siswa. Penelitian ini dilaksanakan di MAN 1 Tanjung Pura, dengan jumlah sampel sebanyak 141 siswa di kelas XI-IPA. Penelitian ini merupakan teknik eksperimen semu menggunakan rancangan kelompok eksperimen pretes-postes dengan desain faktorial 4x2. Teknik analisis data menggunakan ANAVA dua jalur dan dilanjutkan dengan Uji *Duncan's Multiple Range Test* menggunakan bantuan SPSS 22.00 pada taraf signifikansi 0.05. Hasil penelitian menunjukkan bahwa: (1) terdapat pengaruh signifikan teknik pembelajaran terhadap kemampuan berpikir kritis (KBK) siswa ($F=87.082$; $P=0.000$), dimana nilai KBK yang diajar dengan *argument mapping* (88.83 ± 2.478) secara signifikan lebih tinggi daripada yang diajar dengan *direct instruction* (78.03 ± 2.658), (2) terdapat pengaruh signifikan sikap ilmiah (SI) terhadap kemampuan berpikir kritis siswa ($F=2.493$; $P=0.040$), dimana nilai SI tinggi yang diajar dengan teknik pembelajaran (85.00 ± 4.401) secara signifikan lebih tinggi daripada nilai SI rendah yang diajar dengan teknik pembelajaran (74.93 ± 3.254), (3) terdapat interaksi antara teknik pembelajaran dan SI terhadap KBK siswa ($F=2.037$; $P=0.000$), dimana nilai KBK yang diajar dengan *mind mapping* dengan SI tinggi secara signifikan berbeda daripada nilai KBK yang diajar dengan *direct instruction* dengan SI tinggi ($P=0.031<0.05$) dan *direct instruction* dengan SI rendah ($P=0.000<0.05$), (4) terdapat pengaruh signifikan teknik pembelajaran terhadap kemampuan pemecahan masalah (KPM) siswa ($F=94.214$; $P=0.000$), dimana nilai KPM yang diajar dengan *concept mapping* (87.74 ± 2.586) secara signifikan lebih tinggi daripada yang diajar dengan *direct instruction* (78.84 ± 2.689), (5) terdapat pengaruh signifikan sikap ilmiah terhadap kemampuan pemecahan masalah siswa ($F=3.397$; $P=0.031$), dimana nilai SI tinggi yang diajar dengan teknik pembelajaran (85.68 ± 4.312) secara signifikan lebih tinggi daripada nilai SI rendah yang diajar dengan teknik pembelajaran (77.26 ± 3.614), dan (6) terdapat interaksi antara teknik pembelajaran dan SI terhadap KPM siswa ($F = 2.195$; $P = 0.000$), dimana nilai KPM yang diajar dengan *argument mapping* dengan SI tinggi secara signifikan berbeda daripada nilai KPM yang diajar dengan *direct instruction* dengan SI tinggi ($P=0.042<0.05$) dan *direct instruction* dengan SI rendah ($P=0.000<0.05$).

Kata Kunci: Teknik Pembelajaran, Sikap Ilmiah, Kemampuan Berpikir Kritis, Kemampuan Pemecahan Masalah