

**STEM TEACHING BELIEFS ANALYSES AT SECONDARY
LEVEL: A COMPARATIVE STUDY BETWEEN INDONESIA
AND TAIWAN**

THESIS

Submitted as A Requirement to Obtain a Master of Education Degree



Arranged by:
Nadia Mubarokah
2105405

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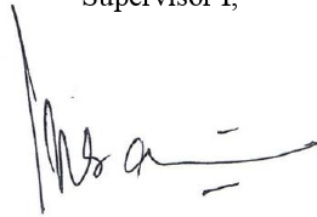
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APPROVAL FORM OF RESEARCH PAPER
STEM TEACHING BELIEFS ANALYSES AT SECONDARY LEVEL: A
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by:

Nadia Mubarokah 2105405

Supervisor I,



Arif Hidayat, S.Pd., M.Si., Ph.D.Ed
NIP. 198007162008011008

Supervisor II,



Prof. Ying-Shao Hsu, Ph.D.

Perceived by,
Head of Science Education Master Program



Prof. Dr. Ida Kaniawati, M.Si.
NIP. 196807031992032001

STEM TEACHING BELIEFS ANALYSES AT SECONDARY LEVEL: A COMPARATIVE STUDY BETWEEN INDONESIA AND TAIWAN

Nadia Mubarokah, Arif Hidayat, and Ying-Shao Hsu

ABSTRACT

STEM learning effectiveness is related to teachers' pedagogy, shaped by their beliefs about STEM education and the required knowledge and skills to teach STEM. In Indonesia and Taiwan, official STEM integration guidelines are not yet established within the curriculum frameworks. This study aimed to investigate STEM teachers' teaching beliefs in Indonesia and Taiwan. The research methodology involved a mixed-method approach, which included administering STEM-TTBIQ, analyzing STEM lesson plans, and conducting teacher interviews. The results indicate significant differences in the teaching beliefs of Indonesian and Taiwanese teachers, with Indonesian teachers rating higher on all STEM teaching beliefs dimensions. Both groups of teachers emphasize 21st-century skills and STEM literacy as educational goals but differ in their use of discipline integration level and instructional design. Indonesian STEM lesson plans were multidisciplinary and incorporated project-based learning, while Taiwanese lesson plans were transdisciplinary and incorporated inquiry-based learning. Indonesian and Taiwanese teachers believed in the relevance of integrating STEM courses with other disciplines and the importance of hands-on activities in STEM instruction. However, their beliefs differed in areas such as the degree of cooperation and community participation in STEM instruction and technology usage in the classroom. Future studies may investigate how teachers' beliefs connect to student learning outcomes, informing the development of evidence-based teaching practices that align with teachers' beliefs and improve student learning processes and outcomes.

Keywords: STEM learning, STEM teaching beliefs, mixed-method, comparative study

**ANALISIS KEYAKINAN MENGAJAR STEM PADA TINGKAT
SEKOLAH MENENGAH: STUDI PERBANDINGAN ANTARA
INDONESIA DAN TAIWAN**

Nadia Mubarokah, Arif Hidayat, dan Ying-Shao Hsu

ABSTRAK

Efektivitas pembelajaran STEM terkait dengan pedagogi guru, yang dibentuk oleh keyakinan mereka tentang pendidikan STEM dan pengetahuan serta keterampilan yang diperlukan untuk mengajar STEM. Di Indonesia dan Taiwan, panduan integrasi STEM resmi belum ditetapkan dalam kerangka kurikulum. Penelitian ini bertujuan untuk menyelidiki keyakinan mengajar guru STEM di Indonesia dan Taiwan. Metodologi penelitian melibatkan pendekatan campuran, yang meliputi pemberian STEM-TTBIQ, analisis rencana pelajaran STEM, dan wawancara dengan guru. Hasil penelitian menunjukkan perbedaan signifikan dalam keyakinan mengajar guru Indonesia dan Taiwan, dengan guru Indonesia memberikan penilaian lebih tinggi pada semua dimensi keyakinan mengajar STEM. Kedua kelompok guru menekankan keterampilan abad ke-21 dan literasi STEM sebagai tujuan pendidikan, namun berbeda dalam penggunaan tingkat integrasi disiplin dan desain pembelajaran. Rencana pelajaran STEM Indonesia bersifat multidisiplin dan menggabungkan pembelajaran berbasis proyek, sedangkan rencana pelajaran Taiwan bersifat transdisiplin dan menggabungkan pembelajaran berbasis penyelidikan. Instruktur STEM Indonesia dan Taiwan meyakini relevansi integrasi mata pelajaran STEM dengan disiplin lain dan pentingnya kegiatan praktik langsung dalam pembelajaran STEM. Namun, keyakinan mereka berbeda dalam hal tingkat kerjasama dan partisipasi komunitas dalam pembelajaran STEM serta penggunaan teknologi di dalam kelas. Studi selanjutnya dapat menyelidiki bagaimana keyakinan guru terhubung dengan hasil belajar siswa, yang dapat menjadi dasar pengembangan praktik pengajaran berbasis bukti yang sejalan dengan keyakinan guru dan meningkatkan hasil belajar siswa.

Kata kunci: pembelajaran STEM, keyakinan mengajar STEM, tingkat sekunder, studi komparatif

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