

**PROGRAM PENGEMBANGAN PROFESIONALISME GURU
DENGAN STRATEGI STEM WAT (*With Activity for Teachers*) – *HYBRID* UNTUK
MENINGKATKAN STEM PCK GURU IPA SMP**

Disertasi

Diajukan Untuk Memenuhi Sebagian Syarat Untuk Memperoleh Gelar Doktor
Pendidikan IPA

Program Studi Pendidikan Ilmu Pengetahuan Alam



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PROGRAM STUDI PENDIDIKAN ILMU PENGETAHUAN ALAM
UNIVERSITAS PENDIDIKAN INDONESIA**

2023

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DENGAN STRATEGI STEM WAT (*With Activity for Teachers*) –
HYBRID UNTUK MENINGKATKAN STEM PCK GURU IPA SMP**

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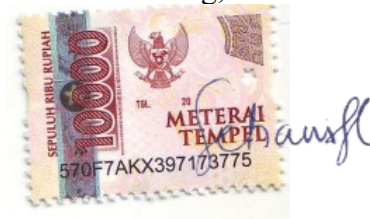
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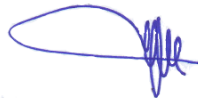
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UCAPAN TERIMA KASIH

Penulis sangat berterima kasih terutama kepada Dr. Riandi, M. Si. sebagai promotor, Prof. Dr. Anna Permanasari, M. Si. sebagai co-promotor, dan Prof. Dr. Ida Kaniawati, M. Si. sebagai anggota tim promosi, atas segala bimbingan, saran, dan nasihatnya selama penelitian dan penulisan disertasi ini.

Kepada yang tercinta, ibu, suami, dan ananda Hasna dan Haziq, serta seluruh keluarga besar penulis, disampaikan penghargaan dan ucapan terima kasih atas dukungan, doá, curahan kasih sayang, dan pasokan semangat yang tak ada habisnya.

Kepada rekan-rekan seperjuangan di Program Doktorat Pendidikan IPA tahun 2019, terima kasih atas segala kebersamaan selama kita menjalani suka dan duka di masa perkuliahan. Semoga semangat kebersamaan kita dalam menghadapi segala tantangan akan terus berlanjut.

Penulis juga berterima kasih kepada para pimpinan dan rekan-rekan kerja penulis di Balai Besar Guru Penggerak (BBGP) Provinsi Jawa Barat, atas izin dan dukungannya selama penulis menjalani masa studi.

Atas jasa seluruh dosen, karyawan, dan semua pihak lain yang tidak dapat disebutkan satu per satu, penulis mengucapkan terima kasih dan memohonkan balasan yang lebih baik dari Allah SWT.

Bandung, Mei 2023

Penulis

ABSTRAK

Menghadapi perkembangan teknologi yang cukup pesat pada abad 21 ini, reformasi dalam dunia pendidikan mutlak diperlukan. Guru perlu melakukan inovasi pembelajaran yang dapat mengembangkan keterampilan abad 21 siswa, agar siswa dapat menghadapi tantangan zaman dengan baik. Salah satu inovasi pembelajaran yang dapat melatih keterampilan abad 21 ini adalah pembelajaran STEM. Agar guru dapat melaksanakan pembelajaran STEM dengan baik, perlu dikembangkan program pengembangan profesionalisme guru (P3G). Agar P3G berjalan efektif, aktivitas pembelajaran pada saat pelaksanaan program dan alokasi waktu pelaksanaan program menjadi faktor penentu. Penelitian ini mengembangkan P3G dengan strategi STEM *With Activity for Teachers* (WAT), menggunakan pola *hybrid*. Tujuan penelitian adalah untuk menghasilkan program pengembangan profesionalisme guru dalam pembelajaran STEM yang valid dan teruji, dan mengevaluasi peran P3G dengan strategi STEM WAT-*Hybrid* terhadap pengembangan STEM PCK guru IPA. Metode yang digunakan dalam penelitian ini adalah penelitian campuran atau *mixed methods research*, dimana peneliti mengumpulkan dan menganalisis data, mengintegrasikan temuan, dan menarik kesimpulan dengan menggunakan dua pendekatan, yaitu analisis data kuantitatif dan kualitatif. Indikator-indikator STEM PCK dijadikan ukuran keberhasilan program. P3G dengan strategi STEM WAT – *Hybrid* dilaksanakan dengan dua moda, yaitu moda tatap muka, diikuti dengan moda *online*. Hasil penelitian menunjukkan bahwa program mempunyai pengaruh yang cukup tinggi terhadap peningkatan pengetahuan guru mengenai pembelajaran STEM (ukuran efek 3,589). Keterampilan guru dalam mengembangkan perangkat pembelajaran STEM (lembar kerja peserta didik, rencana pembelajaran, dan asesmen) secara keseluruhan berada pada kategori baik. Hasil analisis video implementasi pembelajaran STEM menunjukkan bahwa keterampilan guru dalam mengimplementasikan pembelajaran STEM sudah amat baik. Implementasi pembelajaran STEM juga memberikan kontribusi terhadap peningkatan hasil belajar siswa. Analisis dengan menggunakan analisis deskriptif kuantitatif dan kualitatif menunjukkan bahwa dampak program terhadap peningkatan pengetahuan siswa adalah 65,2% nilai N Gain siswa berada pada kategori tinggi, dan 34,8% siswa berada pada kategori sedang. Untuk keterampilan abad 21 siswa pada keterampilan berpikir kritis, kreatif, komunikasi, dan kolaborasi berada pada kategori baik.

Kata Kunci: *STEM, Pembelajaran STEM, STEM PCK, program pengembangan profesionalisme guru, hybrid.*

ABSTRACT

Facing the rapid development of technology in the 21st century, reforms in the world of education are necessary. Teachers need to make learning innovations that can develop students' 21st-century skills so that students can face the challenges of the times well. One of the learning innovations that can train 21st-century skills is STEM learning. For teachers to carry out STEM learning well, developing a Teachers Professional Development Program (TPD) is necessary. For a TPD program to run effectively, learning activities during program implementation and the time allocation for program implementation are determining factors. This research develops TPD program in STEM With Activity for Teachers (WAT) using a hybrid pattern. The research objectives were to produce a valid and tested STEM learning TPD program and to evaluate the role of the STEM WAT-Hybrid teachers professional development program in the development of science teachers STEM PCK. The method used in this research is mixed methods research, in which researchers collect and analyze data, integrate findings, and draw conclusions using two approaches, namely quantitative and qualitative data analysis. STEM PCK indicators are used as a measure of program success. TPD with STEM WAT – Hybrid is implemented with a face-to-face mode, followed by an online mode. The study results show that the program has a fairly strong influence on increasing teacher knowledge about STEM learning. Teacher skills in developing STEM learning tools (student worksheets, lesson plans, and assessments) are good. The video analysis results of the implementation of STEM learning show that the teacher's skills in implementing STEM learning are good. The implementation of STEM learning also contributes to improving student learning outcomes. Analysis using descriptive quantitative and qualitative shows that the impact of the program on increasing student knowledge is 65.2% of students' N Gain scores are in the high category, and 34.8% of students are in the medium category. For students' 21st century skills in critical thinking, creative, communication, and collaboration skills are in the good category.

Keywords: STEM, STEM learning, STEM PCK, teacher professional development program, hybrid training.

DAFTAR ISI

LEMBAR PERNYATAAN KEASLIAN DISERTASI ..	Error! Bookmark not defined.
LEMBAR PENGESAHAN DISERTASI	ii
ABSTRAK	v
DAFTAR ISI	viii
BAB I	Error! Bookmark not defined.
1.1. Latar Belakang Penelitian	Error! Bookmark not defined.
1.2. Rumusan Masalah Penelitian	Error! Bookmark not defined.
1.3. Pembatasan Masalah	Error! Bookmark not defined.
1.4. Tujuan Penelitian	Error! Bookmark not defined.
1.5. Manfaat Hasil Penelitian	Error! Bookmark not defined.
1.6. Definisi Operasional	Error! Bookmark not defined.
1.7. Struktur Organisasi Disertasi	Error! Bookmark not defined.
BAB II	Error! Bookmark not defined.
2.1. Pembelajaran STEM (<i>Science, Technology, Engineering, and Mathematics</i>) Error! Bookmark not defined.	
2.2. Program Pengembangan Profesionalisme Guru (P3G) sebagai Sarana Peningkatan Kompetensi Guru	Error! Bookmark not defined.
2.3. PCK dan STEM PCK	Error! Bookmark not defined.
2.4. Konsep Sains dalam P3G dengan strategi STEM WAT – Hybrid	Error! Bookmark not defined.
2.5. Learning Management System (LMS) untuk <i>On the Job Training</i>	Error! Bookmark not defined.
2.6. Kerangka Pikir Penelitian	Error! Bookmark not defined.
BAB III	Error! Bookmark not defined.
3.1. Desain Penelitian	Error! Bookmark not defined.
3.2. Partisipan	Error! Bookmark not defined.
3.3. Instrumen Penelitian	Error! Bookmark not defined.
3.4. Prosedur Penelitian	Error! Bookmark not defined.
3.5. Analisis Data	Error! Bookmark not defined.

BAB IV	Error! Bookmark not defined.
4.1. Karakteristik Program Pengembangan Profesionalisme Guru (P3G) dengan Strategi STEM WAT-<i>Hybrid</i>	Error! Bookmark not defined.
4.2. Pengaruh P3G dengan Strategi STEM WAT-<i>Hybrid</i> Moda Tatap Muka Terhadap Peningkatan Pengetahuan Guru Mengenai Pembelajaran STEM .	Error! Bookmark not defined.
4.3. Keterampilan Guru Dalam Mengembangkan Perangkat Pembelajaran STEM	Error! Bookmark not defined.
4.4. Keterampilan Guru Dalam Mengimplementasikan Pembelajaran STEM di Kelas	Error! Bookmark not defined.
4.5. Dampak P3G dengan strategi STEM WAT – <i>Hybrid</i> Terhadap Peningkatan Pengetahuan Sains dan Keterampilan Abad 21 Siswa	Error! Bookmark not defined.
BAB V	Error! Bookmark not defined.
DAFTAR PUSTAKA	xiii

DAFTAR TABEL

<u>Tabel 2. 1 Integrasi EDP dalam Sintaks Model Pembelajaran 5E</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 1 Data Partisipan Penelitian.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 2 Instrumen Penelitian.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 3 Hasil Validasi Soal</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 4 Hasil uji korelasi Rho Spearman</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 5 Kriteria dan indikator rencana dan asesmen pembelajaran STEM</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 6 Kriteria dan indikator LKPD pembelajaran STEM.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 7 Kriteria dan indikator video pembelajaran STEM</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 3. 8 Hasil validasi instrumen evaluasi program.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 1 Silabus P3G dengan strategi STEM WAT-<i>Hybrid</i></u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 2 Hasil validasi ahli tentang relevansi silabus program terhadap pengembangan STEM PCK guru</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 3 Masukan Validator Terhadap Silabus Program.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 4 Rangkuman Hasil Analisis Produk Peserta Dan Catatan Lapangan</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 5 Hasil Revisi P3G dengan strategi STEM WAT-<i>Hybrid</i>.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 6 Desain “Kota Ramah Lingkungan”</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 7 <i>Prototype</i> “Kota Ramah Lingkungan”</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 8 Komponen dalam Video Implementasi Pembelajaran STEM.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 9 Activity completion peserta P3G dengan strategi STEM WAT-<i>Hybrid</i> dalam LMS.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 10 Data peserta yang tuntas mengikuti P3G dengan strategi STEM WAT - <i>Hybrid</i>.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 11 Pengaruh Program terhadap Peningkatan Pengetahuan Guru tentang Pembelajaran STEM.....</u>	<u>Error! Bookmark not defined.</u>
<u>Tabel 4. 12 Hasil Uji Wilcoxon Berpasangan</u>	<u>Error! Bookmark not defined.</u>

Tabel 4. 13 Integrasi konsep dalam mata diklat SP dan EDP dalam pembelajaran STEM
.....**Error! Bookmark not defined.**

Tabel 4. 14 Keterkaitan mata diklat, aktivitas pembelajaran, dan indikator *integration knowledge*
.....**Error! Bookmark not defined.**

Tabel 4. 15 Keterkaitan mata diklat, aktivitas pembelajaran, dan indikator *21st century skills*
.....**Error! Bookmark not defined.**

Tabel 4. 16 Rencana Pembelajaran TE.....**Error! Bookmark not defined.**

Tabel 4. 17 Pengetahuan Kognitif Sains Siswa Ditinjau dari Gender.**Error! Bookmark not defined.**

Tabel 4. 18 Ketrampilan Abad 21 Siswa.....**Error! Bookmark not defined.**

DAFTAR GAMBAR

Gambar 2. 1 Tujuh Tahap EDP (Capraro et al., 2013)....**Error! Bookmark not defined.**

Gambar 2. 2 Keterampilan di Abad 21 (Koenig, 2011) ..**Error! Bookmark not defined.**

Gambar 2. 3 Pelangi Keterampilan Abad 21 (Trilling & Fadel, 2009) **Error! Bookmark not defined.**

Gambar 2. 4 Paradigma Penelitian**Error! Bookmark not defined.**

Gambar 3. 1 Desain Penelitian**Error! Bookmark not defined.**

Gambar 3. 2. Tahapan pelaksanaan program**Error! Bookmark not defined.**

Gambar 3. 3 Tampilan LMS moda online (on the job training).... **Error! Bookmark not defined.**

Gambar 4. 1 Alur pengembangan program**Error! Bookmark not defined.**

Gambar 4. 2 Gambaran tampilan aktivitas dalam LMS ..**Error! Bookmark not defined.**

Gambar 4. 3 Forum diskusi dalam LMS**Error! Bookmark not defined.**

Gambar 4. 4 Alur implementasi program STEM WAT – Hybrid. **Error! Bookmark not defined.**

Gambar 4.5 Tujuh Tahap EDP (Capraro et al., 2013).....**Error! Bookmark not defined.**

Gambar 4.6 LK praktikum mengukur tegangan dan arus**Error! Bookmark not defined.**

Gambar 4. 7 Data hasil percobaan.....**Error! Bookmark not defined.**

Gambar 4. 8 LK praktikum mengukur energi sinar matahari..... **Error! Bookmark not defined.**

Gambar 4. 9 Data hasil percobaan waktu terhadap kuat arus pada panel surya..... **Error! Bookmark not defined.**

Gambar 4. 10 Perbaikan Desain Kelompok 3**Error! Bookmark not defined.**

Gambar 4. 11 Contoh tujuan pembelajaran dari peserta program. **Error! Bookmark not defined.**

Gambar 4. 12 Contoh aktivitas pembelajaran STEM.....**Error! Bookmark not defined.**

Gambar 4. 13 Simulasi Pembelajaran STEM.....**Error! Bookmark not defined.**

Gambar 4. 14 Sesi satu refleksi pelatihan in service training..... **Error! Bookmark not defined.**

Gambar 4. 15 Hasil refleksi dan respon peserta**Error! Bookmark not defined.**

Gambar 4. 16 Aktivitas pembelajaran pada sesi 2.....**Error! Bookmark not defined.**

Gambar 4. 17 Hasil rekaman zoom meeting sesi 2**Error! Bookmark not defined.**

Gambar 4. 18 Forum diskusi pada sesi 2.....**Error! Bookmark not defined.**

Gambar 4. 19 Aktivitas LMS pada sesi 3.....**Error! Bookmark not defined.**

Gambar 4. 20 Zoom meeting sesi ketiga**Error! Bookmark not defined.**

Gambar 4. 21 Aktivitas dalam forum diskusi.....**Error! Bookmark not defined.**

Gambar 4. 22 Aktivitas dalam LMS sesi 4.....**Error! Bookmark not defined.**

Gambar 4. 23 Aktivitas LMS sesi 5**Error! Bookmark not defined.**

Gambar 4. 24 Hasil evaluasi program**Error! Bookmark not defined.**

Gambar 4. 25 Distribusi jumlah guru berdasarkan setiap indikator dalam pengetahuan STEM PCK.....**Error! Bookmark not defined.**

Gambar 4. 26 Pengaruh program untuk setiap individu..**Error! Bookmark not defined.**

Gambar 4. 27 Pengaruh program pada indikator STEM *integration knowledge* **Error! Bookmark not defined.**

Gambar 4. 28 Nilai N gain pada *pedagogical knowledge* **Error! Bookmark not defined.**

Gambar 4. 29 Nilai N gain pada indikator *21st century skills*..... **Error! Bookmark not defined.**

Gambar 4. 31 Hasil penilaian LKPD bagian identifikasi masalah **Error! Bookmark not defined.**

Gambar 4. 32 Identifikasi masalah oleh ND**Error! Bookmark not defined.**

Gambar 4. 33 Potensi Sekolah ND.....**Error! Bookmark not defined.**

Gambar 4. 34 Contoh Perkiraan Jawaban Siswa**Error! Bookmark not defined.**

Gambar 4. 35 Hasil Penilaian Aktivitas Bertukar Pikiran dalam LKPD..... **Error! Bookmark not defined.**

Gambar 4. 36 Kegiatan Praktikum pada Aktivitas Bertukar Pikiran dalam LKPD DS**Error! Bookmark not defined.**

Gambar 4. 37 Hasil Penilaian *Prototype* dalam LKPD...**Error! Bookmark not defined.**

Gambar 4. 38 Hasil penilaian Rencana dan Asesmen Pembelajaran STEM..... **Error! Bookmark not defined.**

Gambar 4. 39 Contoh Tujuan Pembelajaran yang Dibuat Peserta Program **Error! Bookmark not defined.**

Gambar 4. 40 Contoh Aktivitas Pembelajaran yang Dibuat Peserta.... **Error! Bookmark not defined.**

Gambar 4. 41 Contoh Soal Kognitif dalam Rencana Pembelajaran.....**Error! Bookmark not defined.**

Santi Setiani Hasanah, 2023

PROGRAM PENGEMBANGAN PROFESIONALISME GURU DENGAN STRATEGI STEM WAT (*With Activity for Teachers*) - HYBRID UNTUK MENINGKATKAN STEM PCK GURU IPA SMP

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Gambar 4. 42 Contoh Rubrik yang Dibuat Peserta**Error! Bookmark not defined.**
Gambar 4. 43 Nilai Keterampilan Guru dalam Implementasi Pembelajaran STEM
.....**Error! Bookmark not defined.**
Gambar 4. 44 Tahap Reflection.....**Error! Bookmark not defined.**
Gambar 4. 45 Tahap Research.....**Error! Bookmark not defined.**
Gambar 4. 46 Peningkatan Pengetahuan Sains Siswa**Error! Bookmark not defined.**
Gambar 4. 47 Contoh Soal Kognitif yang Diujikan Pada Siswa... **Error! Bookmark not defined.**
Gambar 4. 48 Contoh Rubrik Penilaian Keterampilan Siswa **Error! Bookmark not defined.**
Gambar 4. 49 Distribusi Jumlah Siswa Berdasarkan Nilai Keterampilan Abad 21 **Error! Bookmark not defined.**

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Santi Setiani Hasanah, 2023

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Santi Setiani Hasanah, 2023

PROGRAM PENGEMBANGAN PROFESIONALISME GURU DENGAN STRATEGI STEM WAT (With Activity for Teachers) - HYBRID UNTUK MENINGKATKAN STEM PCK GURU IPA SMP

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xxii

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