

**PENGEMBANGAN *E-BOOK* GURU FISIKA MENGGUNAKAN
PENDEKATAN MULTIMODUS REPRESENTASI DAN
*TECHNOLOGICAL PEDAGOGICAL AND CONTENT
KNOWLEDGE (TPACK)* UNTUK MENINGKATKAN
KOMPETENSI PEDAGOGI DAN PROFESIONAL SERTA
LITERASI TEKNOLOGI INFORMASI DAN KOMUNIKASI (TIK)
PADA ASPEK PENGETAHUAN**

Disertasi

Diajukan untuk Memenuhi Sebagian dari Syarat Memperoleh Gelar
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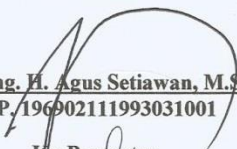
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MASRIFAH

**PENGEMBANGAN *E-BOOK* GURU FISIKA BERBASIS MULTIMODUS
REPRESENTASI DAN *TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE*
(TPACK) UNTUK MENINGKATKAN KOMPETENSI PEDAGOGI DAN
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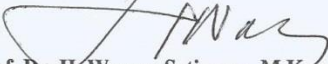
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**PENGEMBANGAN *E-BOOK* GURU FISIKA MENGGUNAKAN
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PEDAGOGICAL CONTENT KNOWLEDGE (TPACK) UNTUK
MENINGKATKAN KOMPETENSI PEDAGOGI DAN PROFESIONAL
SERTA LITERASI TEKNOLOGI INFORMASI DAN KOMUNIKASI (TIK)
PADA ASPEK PENGETAHUAN**

Abstrak

Pengembangan kompetensi guru dalam jabatan perlu dilakukan secara berkelanjutan seiring dengan perkembangan ilmu pengetahuan, teknologi, dan tuntutan kurikulum baru. Pemerintah telah menyelenggarakan berbagai program untuk peningkatan kompetensi guru dalam jabatan, misalnya dalam bentuk pelatihan dan pengembangan profesi guru. Salah satu komponen penting dari program tersebut adalah buku pegangan guru yang berkualitas. Namun selama ini belum dikaji keefektifan penggunaan buku guru yang ada terhadap peningkatan kompetensi guru. Penelitian ini bertujuan untuk mengembangkan buku guru Fisika SMA/MA menggunakan pendekatan multimodus representasi dan TPACK untuk meningkatkan kompetensi pedagogi dan profesional serta literasi TIK guru *Inservice* dan *Preservice*. Metode penelitian yang digunakan adalah penelitian *Educational Research and Development* (R&D). Ujicoba terhadap produk buku guru yang dikembangkan dilakukan dengan skala terbatas dan skala yang lebih luas. Sedangkan untuk menguji keefektifan buku guru digunakan desain penelitian kuasi eksperimen dengan desain *nonequivalent control group*. Penelitian ini dilakukan di Kota Ternate dengan melibatkan 41 guru Fisika *inservice* (30 wanita dan 11 pria) dan 40 guru *preservice* (33 wanita dan 7 pria) yang diambil secara *purposive sampling*. Data kompetensi dan literasi TIK guru dianalisis menggunakan uji beda rata-rata dan uji ukuran dampak untuk mengetahui keefektifan buku. Produk dari penelitian ini adalah *e-book* guru Fisika materi dinamika partikel yang dikembangkan menggunakan pendekatan multimodus representasi dimana konten disajikan dalam berbagai jenis representasi statis (verbal, gambar, diagram piktorial, tabel, grafik, dan persamaan matematis) dan dinamis (video simulasi dan animasi) sehingga dihasilkan uraian yang lebih jelas dan lengkap. Selain itu, konten buku guru dikemas dalam bentuk *e-book* dengan format *epub* yang dapat menampilkan video yang dapat diakses dalam kondisi offline sehingga mudah dipelajari kapanpun dan dimanapun. Hasil penelitian menunjukkan bahwa buku guru Fisika SMA/MA berbasis Multimodus Representasi dan TPACK yang dikembangkan memiliki kualitas dan tingkat keterpahaman yang sangat baik. Implementasi buku guru Fisika tersebut efektif dalam meningkatkan kompetensi pedagogi dan profesional serta literasi TIK guru *inservice* dan *preservice* dimana buku guru memiliki dampak yang besar terhadap peningkatan kompetensi tersebut. Selain itu, hasil analisis data angket menunjukkan bahwa hampir seluruh guru *inservice* dan *preservice* memberikan respon positif (sangat setuju) terhadap buku guru Fisika SMA/MA berbasis Multi Modus Representasi dan *Technological Pedagogical and Content Knowledge* (TPACK) yang dikembangkan untuk meningkatkan kompetensi pedagogik dan profesional, serta literasi TIK guru.

Kata kunci: Multi modus representasi, TPACK, kompetensi pedagogik, kompetensi profesional, kompetensi TIK.

**DEVELOPING TEACHER E-BOOK OF PHYSICS USING APPROACH OF
MULTIMODAL REPRESENTATION AND TECHNOLOGICAL
PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK) TO IMPROVE
TEACHERS' PEDAGOGICAL AND PROFESSIONAL COMPETENCIES,
AND TECHNOLOGY OF INFORMATION AND COMMUNICATION
LITERACY ON COGNITIVE ASPECT**

Abstract

Developing In-service teacher competency needs to be carried out continuously in line with the development of science, technology, and the demands of new curriculum. The government has organized various programs to improve in-service teacher competence, for example, in the form of training and teacher professional development. One important component of the program is the quality teacher guide book. But in fact, the effectiveness of its using toward improving teacher competency has not been studied. This study aims to develop SMA/MA Physics teacher guide book based on Multi Modal Representation and Technological Pedagogical and Content Knowledge (TPACK) to improve the pedagogical, and professional competencies and ICT literacy of In-service and Pre-service teachers. This research is Educational Research and Development research (R & D). Trials of teacher guide book that has developed were carried out on a limited and wider scale and to find out the effectiveness of teacher guide book; a quasi-experimental control group design was used. This research was conducted in Ternate City. There are 41 in-service Physics and 40 pre-service teachers. In-service Physics teacher that consists of 30 female teachers and 11 male teachers and 40 pre-service teachers that consists of 33 female teachers and 7 male teachers. This study used purposive sampling in choosing the sample by considering certain criteria. Teacher competency and ICT literacy data were analyzed using a mean difference test and effect size test to determine the effectiveness of the book. The output of this study is a Physics an online teacher guide book. The teacher guide book deals with particle dynamics topic which is developed it using multimodal representation approach. The content of the guide book is presented in various types of static representations (verbal, images, pictorial diagrams, tables, graphics, and mathematical equations) and dynamic (simulation videos and animation) that can provides a clearer and more complete explanation. In addition, the content of teacher guide book is organized in the form of e-book with epub format where the videos can display and accessed in offline conditions. This can be make the teacher feel easy to learn it whenever and wherever they want. The results showed that the developed SMA/MA Physics teacher guide book based on Multi Modal Representation and TPACK is categorized a good quality book that can be well understood. The implementation of the Physics teacher guide book leads to the effective of improving pedagogical and professional competencies and ICT literacy of in-service and pre-service teachers where teacher guide books has a major impact on improving these competencies. In addition, the results of questionnaire data analysis showed that almost all in-service and pre-service teachers give a positive response to the SMA/MA Physics teacher guide book which is developed based on Multi Modal Representation approach and TPACK to improve teachers' pedagogical and professional competenceis and ICT literacy.

Keywords: Multimodal representation, TPACK, pedagogic competence, professional competence, ICT competence.

DAFTAR ISI

	Halaman
HALAMAN JUDUL.....	i
LEMBAR PENGESAHAN	ii
HALAMAN PERNYATAAN BEBAS PLAGIAT	iii
KATA PENGANTAR	iv
UCAPAN TERIMA KASIH.....	v
ABSTRAK	viii
DAFTAR ISI.....	x
DAFTAR TABEL.....	xiii
DAFTAR GAMBAR	xvi
DAFTAR LAMPIRAN.....	xvii
BAB I PENDAHULUAN	1
1.1. Latar Belakang.....	1
1.2. Rumusan Masalah.....	11
1.3. Batasan Masalah	12
1.4. Tujuan Penelitian	13
1.5. Manfaat Penelitian	14
1.6. Definisi Operasional	14
1.7. Struktur Disertasi	15
BAB II KAJIAN PUSTAKA	17
2.1. Pengembangan Kompetensi Guru	17
2.2. Kompetensi Pedagogi Guru	20
2.3. Kompetensi Profesional Guru	24
2.4. Pentingnya Literasi TIK Bagi Guru.....	25
2.5. Karakteristik Buku Panduan Guru.....	28
2.6. Kelayakan Buku Panduan Guru.....	31
2.7. Prosedur Penyusunan Buku Panduan Guru	32
2.8. <i>E-book</i> Sebagai Sumber Belajar Mandiri	32
2.9. Teori Pemrosesan Informasi.....	35
2.10. Pendekatan Multi Modus Representasi	40
2.11. Framework TPACK.....	50
2.12. Pengembangan buku Guru Berbasis Multi Modus Representasi dan TPACK	55
2.13. Kerangka Pikir Penelitian	60
BAB III METODE PENELITIAN	63
3.1. Metode dan Desain Penelitian	63
3.2. Partisipan Penelitian	67
3.3. Instrumen Penelitian	68

3.4. Prosedur Penelitian	72
3.5. Teknis Analisis Data.....	86
3.5.1. Uji Validitas Instrumen	86
3.5.2. Uji Reliabilitas Instrumen.....	89
3.5.3. Uji Kelayakan Buku Guru	90
3.5.4. Uji Keefektifan Buku Guru	92
3.5.5. Analisis Respon Guru Terhadap Buku Guru Fisika	95
BAB IV TEMUAN DAN PEMBAHASAN	96
4.1. Karakteristik Buku Guru Fisika SMA/MA Berbasis Multi Modus Representasi dan TPACK.....	96
4.2. Kelayakan Buku Guru Fisika SMA/MA Berbasis Multi Modus Representasi dan TPACK.....	123
4.2.1. Kualitas Buku Guru Fisika	123
4.2.2. Keterpahaman Buku Guru Fisika	130
4.3. Keefektifan Buku Guru Fisika Berbasis Multi Modus Representasi dan TPACK Terhadap Kompetensi Pedagogi.....	138
4.3.1. Peningkatan Kompetensi Pedagogi Guru	138
4.3.2. Uji Statistik Data Kompetensi Pedagogi	145
4.3.3. Uji Ukuran Dampak Kompetensi Pedagogi	146
4.4. Keefektifan Buku Guru Fisika Berbasis Multi Modus Representasi dan TPACK Terhadap Kompetensi Profesional	157
4.4.1. Peningkatan Kompetensi Profesional Guru.....	157
4.4.2. Uji Statistik Data Kompetensi Profesional	162
4.4.3. Uji Ukuran Dampak Kompetensi Profesional	164
4.5. Keefektifan Penggunaan Buku Guru Fisika Berbasis Multi Modus Representasi dan TPACK Terhadap Kompetensi TIK.....	172
4.5.1. Peningkatan Kompetensi TIK Guru	172
4.5.2. Uji Statistik Data Kompetensi TIK	174
4.5.3. Uji Ukuran Dampak Kompetensi TIK	175
4.6. Respon Guru Terhadap Buku	179
4.6.1. Hasil Respon Guru Melalui Angket	179
4.6.2. Hasil Respon Guru Melalui Wawancara	184
4.7. Pembahasan Umum	189
BAB V SIMPULAN, IMPLIKASI, DAN REKOMENDASI	196
5.1. Simpulan	196
5.2. Implikasi	198
5.3. Rekomendasi.....	198
DAFTAR PUSTAKA	200
LAMPIRAN	211

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