

**A PROPOSED FRAMEWORK OF DIGITAL COMPETENCE FOR
EDUCATORS: GENERAL AND VOCATIONAL EDUCATORS
(DICGEVE)**

DISSERTATION

A dissertation submitted to fulfill one of the requirements for obtaining a Doctor of
Technical and Vocational Education (Dr) in the Technical and Vocational Education
Study Program



by

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**TECHNICAL AND VOCATIONAL EDUCATION STUDY PROGRAM
SCHOOL OF POSTGRADUATE
UNIVERSITAS PENDIDIKAN INDONESIA
BANDUNG
2025**

A Proposed Framework of Digital Competence for Educators: General and Vocational Educators (DICGEVE)

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PREFACE

All praise and gratitude be to Allah SWT for His grace, guidance, and blessings, which have enabled the author to complete this dissertation entitled "**A PROPOSED FRAMEWORK OF DIGITAL COMPETENCE FOR EDUCATORS: GENERAL AND VOCATIONAL EDUCATORS (DICGEVE)**" This dissertation is submitted as one of the requirements for the Doctoral degree in the technical and vocational education Study Program. This dissertation is motivated by the urgency to strengthen digital competence among vocational teachers in responding to the challenges of the fourth industrial revolution and the ongoing transformation in digital education. Employing a design-based research (DBR) approach, this study was conducted in a series of stages, beginning with a systematic literature review and bibliometric analysis, followed by the development and validation of an instrument, implementation of a large-scale survey, focus group discussions (FGD), and finally, the formulation of a contextual framework for digital competence in vocational education in Indonesia. The author hopes that the findings of this study can contribute both theoretically and practically to the development of adaptive, contextual, and future-oriented vocational education policies. The author is fully aware that this dissertation still has limitations in terms of scope and methodology. Therefore, constructive feedback and suggestions are most welcome for future improvement. May this work prove useful and serve as a reference for enhancing vocational teachers' digital competence and advancing vocational education policy in Indonesia.

Bandung, 15 August 2025

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ABSTRACT

Technological advancements in education remain constant annually, while many educators still lack the skills and competencies needed to effectively implement digital tools in learning. Additionally, the complexity of aligning technology in vocational education with content poses a significant challenge for vocational education educators. The guidance of digital competence for educators was first published in 2017, but it has not been renewed or updated to reflect current standards situation. Therefore, this study aims to develop the key dimensions of digital competencies for vocational and general educators that are relevant to the needs of the 21st century, the demands of the industrial world, and the development of technology. It employs a mixed-method design with a Design-Based Research (DBR) cycle. The development process involves four main data collection phases, beginning with mapping and strengthening topics through preliminary studies: a Systematic Literature Review (SLR) and bibliometric analysis, a Focus Group Discussion (FGD) with vocational educators, a survey instrument for vocational educators, and an FGD with 10 experts in education and vocational education fields. Results indicated that the Digital Ethics dimension scored highest, although FGD responses suggested weak digital ethics practices in the field. Further analysis through Focus Group Discussions (FGD) with experts indicated that teachers should possess a high level of digital competence but still concern with the ethics. The MCDM process identified the highest-priority competency dimension—empowering learners' digital competence (KOMP 10)—which underscores the vital role of teachers in enhancing students' digital skills. Teachers must possess advanced digital competence and expertise to prepare and empower students for the workforce. The final outcome of this research is a contextual, practical digital competency framework that can serve as a foundation for developing training policies, strengthening vocational curricula, and fostering better collaboration between vocational education teacher and industry.

Keywords: digital competence, educators, vocational education, framework development

ABSTRAK

Kemajuan teknologi dalam pendidikan terus meningkat setiap tahunnya, sementara banyak pendidik masih kekurangan keterampilan dan kompetensi yang dibutuhkan untuk menerapkan perangkat digital secara efektif dalam pembelajaran. Selain itu, kompleksitas dalam menyelaraskan teknologi dalam pendidikan vokasi dengan konten menimbulkan tantangan yang signifikan bagi para pendidik di pendidikan vokasi. Panduan kompetensi digital bagi pendidik pertama kali diterbitkan pada tahun 2017, tetapi belum diperbarui atau dimutakhirkan untuk mencerminkan situasi standar terkini. Oleh karena itu, penelitian ini bertujuan untuk mengembangkan dimensi-dimensi kunci kompetensi digital bagi pendidik vokasi dan umum yang relevan dengan kebutuhan abad ke-21, tuntutan dunia industri, dan perkembangan teknologi. Penelitian ini menggunakan desain metode campuran dengan siklus Design Based Research (DBR). Proses pengembangan melibatkan empat fase pengumpulan data utama, dimulai dengan pemetaan dan penguatan topik melalui studi pendahuluan: Systematic Literature Review (SLR) dan analisis bibliometrik, Focus Group Discussion (FGD) dengan pendidik vokasi, instrumen survei untuk pendidik vokasi, dan FGD dengan 10 pakar di bidang pendidikan dan pendidikan vokasi. Hasil penelitian menunjukkan bahwa dimensi Etika Digital memperoleh skor tertinggi, meskipun tanggapan FGD menunjukkan praktik etika digital yang lemah di lapangan. Analisis lebih lanjut melalui FGD dengan para ahli menunjukkan bahwa guru harus memiliki kompetensi digital tingkat tinggi tetapi tetap memperhatikan etika. Proses Multicriteria Decision Making (MCDM) mengidentifikasi dimensi kompetensi dengan prioritas tertinggi—memberdayakan kompetensi digital peserta didik (KOMP 10)—yang menggarisbawahi peran penting guru dalam meningkatkan keterampilan digital siswa. Guru harus memiliki kompetensi dan keahlian digital tingkat lanjut untuk mempersiapkan dan memberdayakan siswa memasuki dunia kerja. Hasil akhir dari penelitian ini adalah kerangka kerja kompetensi digital yang kontekstual dan praktis yang dapat menjadi landasan bagi pengembangan kebijakan pelatihan, penguatan kurikulum vokasi, dan pembinaan kolaborasi yang lebih baik antara guru pendidikan vokasi dan industri.

Kata Kunci: kompetensi digital, pendidik, Pendidikan vokasi, pengembangan kerangka

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LIST OF ABBREVIATIONS

UNESCO	: United Nations Educational, Scientific and Cultural Organization
OECD	: Organisation for Economic Co-operation and Development
COVID-19	: Coronavirus Disease of 2019
LMS	: Learning Management System
IoT	: Internet of Things
AI	: Artificial Intelligence
TPACK	: Technological, Pedagogical, Content Knowledge
TAWOCK	: Technology, Andragogy, Work and Knowledge
FGD	: Focus Group Discussion
DICGEVE	: Digital Competence for General and Vocational Educators
MCDM	: Multi-Criteria Decision Making
AHP	: Analytical Hierarchy Process
SAW	: Simple Additive Weighting
TOPSIS	: Technique for Order Preference by Similarity to Ideal Solution
GUI	: Graphical User Interface
TAM	: Technology Acceptance Model
DBR	: Design Based Research
TVET	: Technical and Vocational Education and Training
ILO	: International Labour Organization
INTEF	: National Institute of Educational Technologies and Teacher Training
TK	: Technological Knowledge
PK	: Pedagogical Knowledge
CK	: Content Knowledge
TCK	: Technological Content Knowledge

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PCK	: Pedagogical Content Knowledge
TPK	: Technological Pedagogical Knowledge
PBL	: Problem-Based Learning
PjBL	: Project-Based Learning
ACK	: Andragogy Content Knowledge
TAK	: Technology Andragogy Knowledge
TWK	: Technology Work Knowledge
WCK	: Work Content Knowledge
NK	: Networking and Collaborative expertise
PEOU	: Perceived Ease of Use
PU	: Perceived Usefulness
SDGs	: Sustainable Development Goals
SLR	: Systematic Literature Review
PRISMA	: Preferred Reporting Items for Systematic Reviews and Meta Analyses
TFN	: Triangular Fuzzy Numbers
GMM	: Geometric Mean Method

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A PROPOSED FRAMEWORK OF DIGITAL COMPETENCE FOR EDUCATORS: GENERAL AND VOCATIONAL EDUCATORS (DICGEVE)

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