

**PENGEMBANGAN MOBILE LEARNING Gen 21cs PADA
PERKULIAHAN GENETIKA UNTUK MENINGKATKAN
KETERAMPILAN ABAD 21 CALON GURU BIOLOGI**

DISERTASI

Diajukan untuk Memenuhi Sebagian dari Syarat untuk Memperoleh
Gelar Doktor Kependidikan dalam Bidang
Pendidikan Ilmu Pengetahuan Alam



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**PROGRAM STUDI PENDIDIKAN IPA
SEKOLAH PASCASARJANA
UNIVERSITAS PENDIDIKAN INDONESIA
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2021**

Yuyun Maryuningsih, 2021

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MENINGKATKAN KETERAMPILAN ABAD 21 CALON GURU BIOLOGI**
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PENGEMBANGAN *MOBILE LEARNING* Gen 21cs PADA PERKULIAHAN GENETIKA UNTUK MENINGKATKAN KETERAMPILAN ABAD 21 CALON GURU BIOLOGI

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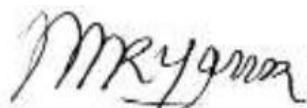
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PERNYATAAN

Dengan ini saya menyatakan bahwa Disertasi dengan judul “**Pengembangan Mobile Learning Gen 21cs pada Perkuliahan Genetika untuk Meningkatkan Keterampilan abad 21 Mahasiswa Calon Guru**” beserta seluruh isinya adalah benar-benar karya saya sendiri, Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko/sanksi yang dijatuhkan kepada saya apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan dalam karya saya ini, atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Cirebon, Januari 2021

Yang Membuat Pernyataan



Yuyun Maryuningsih

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Cirebon, Januari 2021.

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Yuyun Maryuningsih, 2021

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Penelitian disertasi ini dilatarbelakangi oleh adanya kebutuhan untuk meningkatkan keterampilan abad 21 mahasiswa calon guru melalui aplikasi pembelajaran *mobile* Gen 21cs yang telah dikembangkan penulis pada perkuliahan genetika. Kegiatan perkuliahan saat ini belum secara optimal menfasilitasi keterampilan abad 21 melalui kegiatan diskusi online. Keterampilan abad 21 merupakan keterampilan yang harus dimiliki oleh semua generasi muda sebagai bekal menghadapi tantangan global di masa depan. Harapan penulis, hasil dari penelitian ini memberikan kontribusi bagi perkembangan ilmu pengetahuan di bidang pendidikan sains. Hasil dari penelitian ini juga melahirkan beberapa rekomendasi proses pembelajaran *mobile* yang dapat diterapkan dan dikembangkan lebih lanjut pada jenjang perguruan tinggi atau jenjang menengah.

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Penulis
Yuyun Maryuningsih

ABSTRAK

PENGEMBANGAN *MOBILE LEARNING* Gen 21cs PADA PERKULIAHAN GENETIKA UNTUK MENINGKATKAN KETERAMPILAN ABAD 21 CALON GURU BIOLOGI

**Yuyun Maryuningsih
1605244**

Partisipasi mahasiswa yang rendah karena keterbatasan waktu dalam kegiatan diskusi pembelajaran disiasati dengan diskusi *online*. Genetika merupakan bidang ilmu biologi yang perkembangannya pesat, perlu diintegrasikan dalam proses pembelajaran dengan diskusi berpendekatan pemecahan masalah. Kegiatan diskusi *online* melalui media sosial dengan menggunakan *smartphone* disinyalir dapat meningkatkan kemampuan 4C, yaitu komunikasi, kolaborasi, berpikir kritis dan berpikir kreatif inovatif. Kelemahan penggunaan media sosial pada kelas yang banyak, menimbulkan penurunan kinerja *smartphone*. Pengembangan *mobile learning* yang diberi nama Gen 21cs pada perkuliahan genetika merupakan solusi terbaik dalam menjawab permasalahan tersebut. Penelitian ini bertujuan untuk mengembangkan program *mobile learning* Gen 21cs pada perkuliahan genetika untuk meningkatkan kemampuan 4C. Pengembangan pembelajaran *mobile* menggunakan *Design Development Research*. Implementasi program dilakukan pada mahasiswa semester V pada perguruan tinggi di Cirebon, Indonesia. Uji coba program secara terbatas dihasilkan bahwa program dapat diimplementasikan dalam kegiatan perkuliahan genetika. Implementasi program dilakukan secara eksperimental pada tiga kelompok dengan perlakuan pendekatan diskusi *online* yang berbeda yaitu permasalahan dari mahasiswa, dari mahasiswa dan pendidik, dan dari pendidik. Hasil uji coba luas didapatkan program *mobile learning* Gen 21cs pada perkuliahan genetika meningkatkan kemampuan 4C pada mahasiswa. Program *mobile learning* Gen 21cs berkontribusi positif kuat antar domain kemampuan 4C pada mahasiswa, berkontribusi dalam meningkatkan penguasaan konsep genetika pada mahasiswa dan berkontribusi positif cukup kuat antara kemampuan 4C dengan penguasaan konsep genetika pada mahasiswa.

Kata kunci: pembelajaran *mobile*, diskusi *online*, pendekatan pemecahan masalah, kemampuan 4C, genetika, penguasaan konsep.

ABSTRACT

DEVELOPING THE Gen 21cs OF MOBILE LEARNING IN GENETICS CLASS TO IMPROVE THE 21st CENTURY SKILLS OF BIOLOGY TEACHER CANDIDATES

**Yuyun Maryuningsih
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An online discussion can solve students' low participation caused by limited time for a learning discussion. Genetics is a field of biology that receives rapid development and is necessarily integrated with a learning process through discussion with a solving-problem approach. Online discussion activities utilizing smartphone is believed to improve students' 4C skills: communication, collaboration, critical thinking, and innovative-critical thinking. However, using social media in many classes will decrease smartphone performance. Developing mobile learning, known as Gen 21cs in genetics class, is the best solution to solve such a problem. This study aims to develop a Gen 21cs mobile learning program in genetics class to improve students' 4C skills. This mobile learning program was developed by employing Design Development Research. This program was implemented in students of semester 5 at a university in Cirebon, Indonesia. The limited tryout revealed that the program was applicable to a genetics class. The program was implemented experimentally in three online discussion groups that received different approaches: problem-from-students, problem-from-student-and-educator, and problem-from-educator. The extensive tryout reveals that implementing the Gen 21cs mobile learning program in a lecture can improve the students' 4C skills. The Gen 21cs mobile learning program positively contributes to the students' domains of 4C's, significantly improves their genetics concept mastery, and strongly contributes their 4C skills to their genetics concept mastery.

Keywords: mobile learning, online discussion, problem-solving approach, 4C skills, genetics, concept mastery

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