# PENGEMBANGAN PROGRAM PERKULIAHAN PERENCANAAN PENGAJARAN FISIKA BERSTRATEGI *IRTaMS* UNTUK MENINGKATKAN PENGETAHUAN DAN KETERAMPILAN MAHASISWA DALAM MENDESAIN PEMBELAJARAN MENGACU MODEL PBL BERORIENTASI KETERAMPILAN 4C

DISERTASI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Doktor Pendidikan Ilmu Pengetahuan Alam

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# Pengembangan Program Perkuliahan Perencanaan Pengajaran Fisika Berstrategi *IRTaMS* untuk Meningkatkan Pengetahuan dan Keterampilan Mahasiswa dalam Mendesain Pembelajaran Mengacu Model PBL Berorientasi Keterampilan 4C

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**PENGEMBANGAN PROGRAM PERKULIAHAN PERENCANAAN PENGAJARAN FISIKA BERSTRATEGI *IRTaMS* UNTUK MENINGKATKAN PENGETAHUAN DAN KETERAMPILAN MAHASISWA DALAM MENDESAIN PEMBELAJARAN MENGACU MODEL PBL BERORIENTASI KETERAMPILAN 4C**

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Yang Membuat Pernyataan,


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# PENGEMBANGAN PROGRAM PERKULIAHAN PERENCANAAN PENGAJARAN FISIKA BERSTRATEGI *IRTaMS* UNTUK MENINGKATKAN PENGETAHUAN DAN KETERAMPILAN MAHASISWA DALAM MENDESAIN PEMBELAJARAN MENGACU MODEL PBL BERORIENTASI KETERAMPILAN 4C

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## ABSTRAK

Penelitian ini bertujuan untuk menghasilkan program perkuliahan perencanaan pengajaran fisika (PPF) berstrategi *Interactive Reading, Task, Modelling* dan *Scaffolding* (IRTaMS) yang layak dan teruji dalam meningkatkan pengetahuan dan keterampilan mahasiswa untuk mendesain pembelajaran fisika mengacu model *problem based learning* (PBL) berorientasi keterampilan 4C. Penelitian ini menggunakan metode *Developmental Research* (DR) dengan model pengembangan ADDIE (*Analyze, Design, Develop, Implementation,* dan *Evaluation*). Partisipan penelitian ini adalah 24 mahasiswa program studi pendidikan fisika semester 5 yang mengikuti mata kuliah PPF pada salah satu perguruan tinggi di Kalimantan Barat. Data kualitatif dalam penelitian ini diukur menggunakan lembar studi dokumentasi, lembar observasi keterlaksanaan perkuliahan, dan angket persepsi guru dalam studi pendahuluan. Sedangkan data kuantitatif diukur menggunakan tes pengetahuan, lembar penilaian dokumen (instrumen keterampilan 4C, modul ajar dan LKPD), lembar validasi perangkat perkuliahan, lembar validasi instrumen penelitian, dan skala sikap respons mahasiswa. Teknik analisis data menggunakan analisis kualitatif, analisis V Aiken, analisis statistik deskriptif, dan N-Gain. Hasil penelitian menunjukkan bahwa: (1) program perkuliahan PPF berstrategi IRTaMS yang dikembangkan memiliki karakteristik: berorientasi untuk melatihkan pengetahuan dan keterampilan mahasiswa dalam mendesain pembelajaran fisika mengacu model PBL berorientasi keterampilan 4C; berlandaskan teori pembelajaran andragogi, teori belajar konstruktivistik, dan teori belajar sosial; dilaksanakan dalam mode *online* melalui pembelajaran mandiri dan mode *offline* melalui pembelajaran *workshop*; dan dilengkapi dengan bahan belajar berbasis ICT, (2) program perkuliahan PPF berstrategi IRTaMS layak digunakan dengan nilai kevalidan (nilai V Aiken) di atas batas minimum 0,71; 100% kesetujuan mahasiswa terhadap kepraktisan bahan belajar; dan keefektifan program perkuliahan dalam meningkatkan pengetahuan dan keterampilan mahasiswa dalam mendesain pembelajaran mengacu model PBL berorientasi keterampilan 4C dalam kategori peningkatan sedang hingga tinggi; (3) program perkuliahan PPF berstrategi IRTaMS dapat meningkatkan pengetahuan mahasiswa dalam mendesain pembelajaran mengacu model PBL berorientasi keterampilan 4C dengan peningkatan kategori tinggi; (4) program perkuliahan PPF berstrategi IRTaMS dapat meningkatkan keterampilan mahasiswa dalam mendesain pembelajaran mengacu model PBL berorientasi keterampilan 4C. Peningkatan keterampilan mengonstruksi instrumen penilaian keterampilan 4C pada kategori sedang, peningkatan keterampilan mendesain modul ajar dan menyusun LKPD mengacu model *problem based learning* berorientasi keterampilan 4C pada kategori tinggi. (5) mahasiswa memberikan respons positif terhadap pelaksanaan perkuliahan PPF berstrategi IRTaMS. Oleh sebab itu, dapat disimpulkan bahwa program perkuliahan perencanaan pengajaran fisika berstrategi IRTaMS layak dan teruji dalam meningkatkan pengetahuan dan keterampilan mahasiswa mendesain pembelajaran fisika mengacu model *problem based learning* berorientasi keterampilan 4C.

# DEVELOPMENT OF A PHYSICS INSTRUCTION PLANNING COURSE PROGRAM USING THE IRTaMS STRATEGY TO ENHANCE STUDENTS' KNOWLEDGE AND SKILLS IN DESIGNING INSTRUCTIONAL BASED ON THE 4C SKILL-ORIENTED PBL MODEL

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Program Studi Pendidikan IPA

## ABSTRACT

This study aims to produce a physics instruction planning lecture program using the Interactive Reading, Task, Modeling and Scaffolding (IRTaMS) strategy that is feasible and tested in enhance students' knowledge and skills in designing physics instructional based on the 4C skill-oriented problem-based learning MODEL. This study uses the Developmental Research (DR) method with the ADDIE (Analyze, Design, Develop, Implementation, and Evaluation) development model. The participants of this study were 24 students of the 5th semester physics education study program who took the physics instruction planning course at one of the universities in West Kalimantan. Qualitative data in this study were measured using documentation study sheets, lecture implementation observation sheets, and teacher perception questionnaires in the preliminary study. Meanwhile, quantitative data were measured using knowledge tests, document assessment sheets (4C skills instruments, teaching modules and LKPD), lecture device validation sheets, research instrument validation sheets, and student response attitude scales. Data analysis techniques used were qualitative analysis, Aiken's V analysis, descriptive statistical analysis, and N-Gain. The results of the study showed that: (1) the PPF lecture program with the IRTaMS strategy developed has the following characteristics: oriented to train knowledge and skills in designing physics instructional based on the 4C skill-oriented problem-based learning model; based on andragogy theory learning, constructivist learning theory, and social learning theory; implemented in online mode through independent learning and offline mode through workshop learning; and equipped with ICT-based learning materials, (2) the PPF lecture program with the IRTaMS strategy is suitable for use in research with a validity value (V Aiken value) above the minimum limit of 0.71; 100% agreement of student responses to the practicality of learning materials; and the effectiveness of the lecture program in improving students' knowledge and skills in designing learning referring to the 4C skill-oriented PBL model in the medium to high improvement category; (3) the PPF lecture program with the IRTaMS strategy can improve students' knowledge in designing learning referring to the 4C skill-oriented PBL model with a high improvement category; (4) the PPF lecture program with the IRTaMS strategy can improve students' skills in designing learning referring to the 4C skill-oriented PBL model. Improvement in skills in constructing 4C skill assessment instruments is in the medium category, improvement in skills in designing teaching modules and compiling LKPD referring to the 4C skill-oriented problem-based learning model is in the high category. (5) Students gave a positive response to the implementation of PPF lectures with the IRTaMS strategy. Therefore, it can be concluded that the physics instruction planning course using the IRTaMS strategy is valid and tested in enhance students' knowledge and skills in designing physics instructional based on the 4C skill-oriented problem-based learning model.

## DAFTAR ISI

## DAFTAR TABEL

## DAFTAR GAMBAR

## DAFTAR LAMPIRAN

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