## ABSTRACT

Estuhono. 2020. Development of Research Based Learning Models to Improve the Four Cs Skills of High School Physics Learning. Disertation. Postgraduate Program of Universitas Negeri Padang.

The early research results indicated that the low four Cs skills in students, because physics learning that should emphasize the active involvement of students by presenting the real world has not been done optimally. Efforts to overcome this problem were developed research based learning models in high school physics learning. This study used the Plomp development design consisting of preliminary research, prototyping phase, assessment phase. The preliminary research stage was carried out analysis of the characteristics of high school physics learning models, curriculum analysis, analysis of student characteristics, and analysis of learning material. Prototyping phase is carried out design prototype of learning models that include syntax, social systems, reaction principles, support systems, instructional and accompaniment impacts which are then tested for validity, practicality, and effectiveness test. The assessment phase was conducted by a field trial to measure the effectiveness of the developed model. Research data from the validity test were obtained through the validation sheet of the learning model. Research data from practicality tests were obtained through observation sheets of learning implementation, teacher and student response questionnaire. Research data from effectiveness tests were obtained from four Cs skills assessment, knowledge aspects, and student motivation. The results of the preliminary research stage in the analysis of the characteristics of high school physics learning models obtained that physics learning must emphasize student involvement through scientific activities. Curriculum analysis found that the curriculum that became the foundation of high school physics learning was 2013 Curriculum. Analysis of students was obtained that students of class XII were at the formal operational stage so they were able to think abstractly. Material analysis obtained physics learning material about electricity. The results of the research at the prototyping phase obtained syntax, social systems, reaction principles, support systems, instructional impact and accompaniment designed to follow the steps of the research based learning model to improve the skills of four Cs. The results of the assessment phase of the research in the validity test obtained an average percentage of each aspect in the model book, teacher's book, and student books in a row at (87); (91, 29); and (93, 66) with very valid criteria. The results of the analysis of the practicality of the model based on observations of the feasibility of learning obtained an average of 87.51, practicality questionnaire model according to teachers 87, 65, and practicality questionnaire according to students 81.35 with very practical criteria. Furthermore, the results of effectiveness testing through descriptive analysis were effective for improving four Cs skills, aspects of knowledge, and student motivation.

# ABSTRAK

Estuhono. 2020. Pengembangan Model *Research Based Learning* Untuk Meningkatkan Keterampilan *Four Cs* Pada Pembelajaran Fisika SMA. Disertasi. Pascasarjana Universitas Negeri Padang.

Hasil riset awal menunjukkan masih rendahnya keterampilan *four Cs* pada diri siswa, karena pembelajaran fisika yang seharusnya menekankan keterlibatan aktif siswa dengan menghadirkan dunia nyata belum dilakukan secara optimal. Upaya mengatasi masalah ini dikembangkan model *research based learning* pada pembelajaran fisika SMA. Penelitian ini menggunakan desain pengembangan Plomp yang terdiri dari *preliminary research, prototyping phase, assessment phase.* Tahap *preliminary research* dilakukan analisis karakteristik model pembelajaran fisika SMA, analisis kurikulum, analisis karakteristik siswa, dan analisis materi pembelajaran. Tahap *prototyping phase* dilakukan desain *prototype* model pembelajaran yang meliputi sintaks, sistem sosial, prinsip reaksi, sistem pendukung, dampak instruksional dan pengiring yang selanjutnya dilakukan uji validitas, praktikalitas, dan uji efektivitas. Tahap *assessment phase* dilakukan uji coba lapangan untuk mengukur tingkat efektivitas model yang dikembangkan. Data penelitian dari uji validitas diperoleh melalui lembar validasi model pembelajaran. Data penelitian dari uji praktikalitas diperoleh melalui lembar observasi keterlaksanaan pembelajaran, angket respon guru dan siswa. Data penelitian dari uji efektivitas diperoleh dari penilaian keterampilan *four Cs,* aspek pengetahuan, dan motivasi belajar siswa. Hasil penelitian tahap *preliminary research* pada analisis karakteristik model pembelajaran fisika SMA diperoleh bahwa pembelajaran fisika harus menekankan pada pada keterlibatan siswa melalui aktivitas saintifik. Analisis kurikulum diperoleh bahwa kurikulum yang menjadi landasan pembelajaran fisika SMA adalah Kurikulum 2013. Analisis siswa diperoleh bahwa siswa kelas XII berada pada tahap formal operasional sehingga sudah mampu berpikir abstrak. Analisis materi diperoleh materi pembelajaran fisika tentang kelistrikan. Hasil penelitian pada tahap *prototyping phase* diperoleh sintaks, sistem sosial, prinsip reaksi, sistem pendukung, dampak instruksional dan pengiring yang dirancang mengikuti langkah-langkah model *research based learning* untuk meningkatkan keterampilan *four Cs*. Hasil penelitian tahap *assessment phase* pada uji validitas diperoleh persentase rata-rata tiap aspek pada buku model, buku guru, dan buku siswa berturut-turut pada adalah (87); (91, 29); dan (93, 66) dengan kriteria sangat valid. Hasil analisis uji prakikalitas model berdasarkan observasi keterlaksanaan pembelajaran diperoleh rata-rata 87,51, angket kepraktisan model menurut guru 87, 65, dan angket kepraktisan menurut siswa 81,35 dengan kriteria sangat praktis. Selanjutnya hasil uji efektivitas melalui analisis deskriptif, efektif untuk meningkatkan keterampilan *four Cs*, aspek pengetahuan, dan motivasi belajar siswa.