

ABSTRACT

Rudi Mulya, 2021. *Development of Virtual Laboratory Based Practical Learning Model in Vocational Education.*

Vocational education as education-for-work is based on the philosophy of essentialism, existentialism, pragmatism, and has the characteristics of learning theory and practice/practicum. Practicum is usually carried out in a real (hands-on) laboratory, besides having advantages, it also has several limitations like not being able to fulfill distance learning, the problem of limited facilities and infrastructure so that it has an impact on not achieving the expected learning objectives, and the phenomenon of the Coronavirus Disease-19 (Covid-19) pandemic has an impact on changes in the education system from classical learning to digital learning. For this reason, an integrated virtual laboratory-based practicum learning model with a project-based learning was developed to overcome problems in practical learning.

This study the development research method by Research and Development (R&D) using the Plomp design used consists of three phases, namely: 1) preliminary research, 2) development or prototype phase, and 3) assessment phase. The subject of the limited trial involved 15 students and the subject of the expanded trial involved 21 students majoring in Electronic Engineering-D3 FT UNP.

The results of developing a virtual laboratory-based practicum learning model (MPPBLV) in vocational education show that it is very effective. This model also has the advantage of being able to create an online collaborative work environment to complete assigned practicums and projects. The characteristics of MPPBLV in vocational education are valid and practical, teaching materials, lecturer manuals, and student manuals that can be applied easily.

Keywords: *Practical Learning, Virtual Laboratory, Vocational Education.*

ABSTRAK

Rudi Mulya, 2021. Pengembangan Model Pembelajaran Praktikum berbasis Laboratorium Virtual di Pendidikan Vokasi. Disertasi Pascasarjana Fakultas Teknik Universitas Negeri Padang.

Pendidikan vokasional sebagai *education-for-work* berlandaskan pada filosofi esensialisme, eksistensialisme, pragmatisme, dan memiliki karakteristik pembelajaran teori dan praktik/praktikum. Praktikum biasanya dilakukan di laboratorium real (*hands-on*) selain memiliki keunggulan juga memiliki beberapa keterbatasan seperti tidak bisa memenuhi pembelajaran jarak jauh, persoalan keterbatasan sarana dan prasarana sehingga berdampak belum tercapainya tujuan pembelajaran yang diharapkan, dan fenomena pandemi *Coronavirus Disease-19* (Covid-19) berdampak perubahan sistem pendidikan dari *classical learning* menjadi *digital learning*. Untuk itu dikembangkan model pembelajaran praktikum berbasis laboratorium virtual terintegrasi dengan pembelajaran berbasis proyek untuk mengatasi permasalahan dalam pembelajaran praktikum.

Penelitian ini menggunakan metode penelitian pengembangan *Research and Development* (R&D) menggunakan desain Plomp yang terdiri dari tiga fase, yaitu: 1) penelitian pendahuluan, 2) fase pengembangan atau prototipe, dan 3) fase penilaian. Subjek uji coba terbatas melibatkan 15 orang mahasiswa dan subjek uji coba diperluas melibatkan 21 orang mahasiswa jurusan Teknik Elektronika-D3 FT UNP.

Hasil pengembangan model pembelajaran praktikum berbasis laboratorium virtual (MPPBLV) di pendidikan vokasi menunjukkan sangat efektif. Model ini juga memiliki keunggulan dapat menciptakan lingkungan kerja kolaborasi secara *online* untuk menyelesaikan praktikum dan proyek yang telah ditetapkan. Karakteristik MPPBLV di pendidikan vokasi yang valid dan praktis bahan ajar, buku panduan dosen, dan buku panduan mahasiswa yang dapat diterapkan dengan mudah.

Kata kunci: Pembelajaran Praktikum, Laboratorium Virtual, Pendidikan Vokasi.