

ABSTRACT

Arnellis. 2021. Development of Local Instructional Theory Based on Realistic Mathematics Education at Applied of Integral to Improve High Order Thinking Skills Students'. Dissertation Post Graduate Program of Universitas Negeri Padang

Preliminary studies found that problems in integral application learning were still mechanistic, the students' mathematical skills was low. The learning design has not been designed according to the needs of students in learning, In addition, students being less given the opportunity to express their opinions, so that learning that occurs has not been able to develop mathematical thinking skills. This study aims to produce the characteristics of local instructional theory (LIT) based on realistic mathematics education on applied of integral that is valid, practical and effective in developing higher order thinking skills. The research method used were combines the Plomp with the Gravemeijer & Cobb model. The Plomp utilized three main phases, namely: the preliminary research phase; prototype development phase with series of *Self Evaluation*, expert review, one to one evaluation, and small group; and the assessment phase in the form of a *Field Test*. Meanwhile, Gravemeijer & Cobb was used preparing for the experiment phase, conducting the experiment in the classroom and the retrospective analysis phase. At the prototype development stage, a formative evaluation was carried out to investigate the validity and practicality which included self-evaluation, expert review, one-to-one, and small group. At the assessment phase, a summative evaluation is carried out to investigate the effectiveness of the product. The subjects of this study were students of second semester students majoring of Mathematics Study Program, Mathematics and Natural Science Faculty of Universitas Negeri Padang. From the results of data collection obtained quantitative data through tests, while qualitative data were collected through document analysis, observation, interviews, and questionnaires. The data were analyzed by descriptive and inferential analysis. The research produced a Local Instructional Theory based on Realistic Mathematics Education (RME) on applied of integral were implemented through guidebooks for either the lecturer or the student which was Characteristics of local instructional theory based on RME on the integral application were (1) valid: fitted the needs; made use of the appropriate the integral application concept, the coherent components of instructional design, and instructional design which contained LIT components and met the characteristic of RME;(2) practical, with the characteristics: applicable, easy to use, and fascinating ;and (3) effective, the developed LIT had impact on improving the high order thinking skills of students.

ABSTRAK

Arnellis, 2021. Pengembangan *Local Instructional Theory* Berbasis *Realistic Mathematics Education* pada Materi Aplikasi Integral untuk Meningkatkan *High Order Thinking Skills* Mahasiswa. Disertasi. Pascasarjana Universitas Negeri Padang.

Hasil studi pendahuluan ditemukan masalah bahwa pembelajaran aplikasi integral masih bersifat konseptual dan mekanistik, kemampuan berpikir matematis mahasiswa Jurusan Matematika rendah. Pembelajaran belum dirancang sesuai kebutuhan mahasiswa. Penelitian ini bertujuan untuk menghasilkan karakteristik *Local Instructional Theory* (LIT) berbasis *Realistic Mathematics Education* (RME) pada materi aplikasi integral yang memenuhi kriteria valid dan praktis serta efektif memberikan dampak terhadap *high order thinking skills* (HOTS) mahasiswa. Metode penelitian yang digunakan adalah metode *design research*. Penelitian ini mengkombinasikan *design research* Plomp dengan *design research* Gravemeijer & Cobb. Plomp menggunakan tiga fase utama yaitu fase penelitian pendahuluan; fase pengembangan prototipe berupa *Self Evaluation*, *expert review*, *one to one evaluation*, dan *small group*; dan fase penilaian berupa *Field Test*. Sedangkan Gravemeijer & Cobb menggunakan fase persiapan percobaan, fase uji coba desain di kelas, dan fase analisis retrospektif *test*. Jadi tahapan yang digunakan adalah penelitian pendahuluan, fase pengembangan prototype (persiapan percobaan, fase uji coba desain di kelas virtual, fase restroktif), dan fase penilaian. Pada tahap pengembangan *prototype* dilakukan *formatif evaluation* (evaluasi formatif), untuk menyelidiki validitas dan praktikalitas yang meliputi *SelfEvaluation*, *expert review*, *one-to-one*, *small group*. Pada tahap penilaian dilakukan *summative evaluation* (evaluasi formatif) untuk menyelidiki efektifitas produk. Subjek penelitian ini adalah mahasiswa Semester II Program Studi Matematika FMIPA Universitas Negeri Padang. Dari hasil pengumpulan data diperoleh data kuantitatif yang didapatkan melalui tes, sedangkan data kualitatif dikumpulkan melalui analisis dokumen, observasi, wawancara, dan angket. Data dianalisis dengan teknik deskriptif dan inferensial. Hasil yang didapatkan dalam penelitian ini adalah karakteristik *Local Instructional Theory* (LIT) berbasis RME pada materi aplikasi integral (1) valid, sesuai dengan kebutuhan, memanfaatkan konsep aplikasi integral yang tepat, komponen LIT memenuhi prinsip dan karakteristik RME; saling terkait satu sama lain secara konsisten, (2) praktis, dapat digunakan, mudah digunakan, dan memiliki daya tarik yang sangat baik; dan (3) efektif, bahwa LIT yang dikembangkan berdampak terhadap peningkatan *high order thinking skills* mahasiswa.