PENGEMBANGAN MODEL PEMBELAJARAN BERBASIS MASALAH KONTROVERSIAL (CPBL) UNTUK MENINGKATKAN KETERAMPILAN BERPIKIR KRITIS MATEMATIS SISWA SMA

I PUTU PASEK SURYAWAN

ABSTRAK

Penelitian ini bertujuan untuk menghasilkan model pembelajaran berbasis masalah kontroversial atau *controversial problem-based learning* (CPBL) beserta perangkat pembelajarannya yang valid, praktis, dan efektif dapat meningkatkan keterampilan berpikir kritis matematis siswa SMA. Penelitian pengembangan model pembelajaran ini menggunakan penelitian desain dari Plomp dengan tahapan *preliminary research*, *development or prototyping phase*, dan *assessment phase*. Subjek penelitian ini adalah siswa dan guru matematika kelas X di SMA Negeri 2 Singaraja yang telah menerapkan Kurikulum Merdeka. Instrumen penelitian untuk menilai validitas model menggunakan lembar validasi ahli dan lembar observasi keterkaitan komponen model, instrumen kepraktisan menggunakan lembar validasi ahli dan lembar observasi keterlaksanaan model, dan instrumen keefektifan menggunakan kuesioner aktivitas belajar siswa, tes keterampilan berpikir kritis matematis siswa, dan kuesioner tanggapan siswa terhadap pelaksanaan model CPBL. Data yang telah dikumpulkan dianalisis secara deskriptif kuantitatif dan dilanjutkan secara kualitatif untuk memberikan gambaran lengkap dan mendalam dari kajian yang diteliti. Hasil penelitian menunjukkan bahwa model CPBL memenuhi kriteria valid, dimana 83,33% validator menyatakan draf model didasari oleh teori yang kuat, dan semua validator menyatakan komponen model saling berkaitan, serta hasil uji coba menunjukkan komponen model saling berkaitan satu sama lainnya. Model CPBL juga memenuhi kriteria praktis, dimana semua validator menyatakan draf model CPBL dapat diterapkan di kelas, guru menyatakan dapat menerapkan model CPBL di kelas, dan tingkat keterlaksanaan model CPBL berada pada kategori sangat tinggi. Selain itu, model CPBL telah memenuhi kriteria efektif, dimana aktivitas belajar siswa dalam mengikuti pembelajaran tergolong sangat tinggi, keterampilan berpikir kritis matematis siswa tergolong baik yang ditunjukkan melalui daya serap dan ketuntasan belajar siswa telah memenuhi kriteria, serta persentase siswa memberikan tanggapan positif terhadap pelaksanaan model CPBL sangat tinggi. Selanjutnya, perangkat pembelajaran model CPBL yang berupa modul ajar (rencana pembelajaran), buku siswa, dan buku guru juga telah dinyatakan valid oleh validator, terbukti praktis digunakan oleh guru, siswa, dan pengamatan dari observer, serta efektif mampu meningkatkan keterampilan berpikir kritis matematis siswa. Karakteristik model CPBL yang valid, praktis, dan efektif, yaitu: (1) memiliki landasan teoritis model yang merujuk pada landasan filsafat progresivisme, landasan psikologis sosial-konstruktivisme, serta landasan teknologi yang mendukung eksplorasi, penyelidikan kolaboratif, dan pengembangan keterampilan berpikir kritis siswa; dan (2) memiliki komponen dasar model pembelajaran yang dibangun dari modifikasi PBL dengan mengintegrasikan tahapan penalaran kontroversial awal, eksplorasi, dan klarifikasi pada fase III serta menjadikan masalah matematika kontroversial sebagai *starting point* pembelajaran. Dengan demikian, telah dihasilkan model CPBL beserta perangkat pembelajaran yang berkualitas baik dengan memenuhi kriteria valid, praktis, dan efektif dapat meningkatkan keterampilan berpikir kritis matematis siswa SMA.

Kata-kata kunci: model pembelajaran berbasis masalah kontroversial, masalah matematika kontroversial, keterampilan berpikir kritis matematis.

DEVELOPMENT OF A CONTROVERSIAL PROBLEM-BASED LEARNING (CPBL) MODEL TO ENHANCE HIGH SCHOOL STUDENTS' MATHEMATICAL CRITICAL THINKING SKILLS

I PUTU PASEK SURYAWAN

ABSTRACT

This study aims to develop a controversial problem-based learning model (CPBL) along with its learning tools that are valid, practical, and effective in enhancing high school students' mathematical critical thinking skills. This study on the development of a learning model adopts Plomp's design research methodology, which includes the stages of preliminary research, development or prototyping, and assessment. The study subjects include mathematics teachers and tenth-grade students at SMA Negeri 2 Singaraja.. The validity of the model was assessed using expert validation sheets and observation sheets to examine the interconnection of model components. Practicality was measured through expert validation sheets and observation sheets on the implementation of the model. Effectiveness was evaluated using students activity questionnaires, mathematical critical thinking skills tests, and student response surveys regarding the implementation of the model, supplemented by in-dept interviews for further insights. The collected data were analyzed using both descriptive quantitative and qualitative approaches to deepen the study. The findings indicate that the CPBL models meets the validity criteria, with 83,33% of validators confirming that the model Draf is grounded in strong theoretical foundations, and all validator agreeing that the model components are interrelated. The trial results further confirm the interconnectivity of the model components. Expert assessments and trial results also confirm that the CPBL model is practical, as all validator stated that the model draft is applicable in the classroom, teacher reported being able to implement the CPBL model, and the model's implementation level was categorized as very high. The trial results also show that the CPBL model meets the effectiveness criteria, as students' critical thinking activities during learning were categorized as very high, their mathematical critical thinking skills were considered good-demonstrated by meeting the required absorption and learning mastery criteria and the percentage of students providing positive feedback on the model's implementation was very high. In addition, the learning tools of the CPBL model, including the teaching module (lesson plan), student book, and teacher book, have been validated by experts, proven to be practical for both teachers and students based on observations, and effective in enhancing students' engagement and mathematical critical thinking skills. The characteristics of the CPBL model, which is valid, practical, and effective, are as follows: (1) it is based on a theoretical foundation that refers to the philosophy of progressivism, the psychological foundation of social-constructivism, and a technological foundation that supports exploration, collaborative inquiry, and the development of student's critical thinking skills; and (2) it incorporates the fundamental components of a learning model developed through a modified version of Problem-Based Learning (PBL), integrating the stages of initial controversial reasoning, exploration, and clarification in Phase III, while positioning controversial mathematical problems as the starting point of the learning process. Thus, the CPBL model has been successfully develop with high quality, meeting the criteria of validity, practicality, and effectiveness in enhancing high school students' mathematical critical thinking skills.

Keywords: controversial problem-based learning model, controversial mathematical problems, mathematical critical thinking skills.