PENGARUH MODEL *PROJECT BASED LEARNING* (PjBL) BERBANTUAN *PHET SIMULATIONS* TERHADAP KEMAMPUAN PEMAHAMAN MATEMATIS PESERTA DIDIK DI SEKOLAH DASAR

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ABSTRAK

Penelitian ini dilatarbelakangi oleh rendahnya kemampuan pemahaman dan minat belajar matematis peserta didik di sekolah dasar. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh model *Project Based Learning* (PjBL) berbantuan *PhET Simulations* terhadap kemampuan pemahaman matematis peserta didik di SDN 075 Jatayu Bandung. Pendekatan ini menggunakan pendekatan kuantitatif dengan metode eksperimen tipe quasi eksperimen dan desain *Nonequivalent Control Group Design*. Penelitian melibatkan dua kelas, yaitu kelas IV C sebagai kelas eksperimen dan kelas IV A sebagai kelas kontrol. Teknik pengumpulan data dilakukan melalui tes kemampuan pemahaman matematis dalam bentuk *pretest* dan *posttest*, lembar observasi, serta dokumentasi. Analisis data dilakukan menggunakan IBM SPSS *Statistics* 29, dengan tahapan uji normalitas, uji homogenitas, uji hipotesis menggunakan *Independent Sample t-Test* dan uji *Mann-Whitney*, serta uji *effect size*. Hasil penelitian menunjukkan adanya peningkatan kemampuan pemahaman matematis pada peserta didik yang menggunakan model *Project Based Learning* (PjBL) berbantuan *PhET Simulations* maupun model pembelajaran konvensional. Uji *Mann-Whitney* menunjukkan bahwa terdapat perbedaan pengaruh yang signifikan terhadap kemampuan pemahaman matematis antara kelas eksperimen dan kelas kontrol. Hasil uji *effect size* mengindikasikan bahwa penerapan model *Project Based Learning* (PjBL) berbantuan *PhET Simulations* memberikan pengaruh sedang terhadap kemampuan pemahaman matematis peserta didik. Dengan demikian, model *Project Based Learning* (PjBL) yang dipadukan dengan media interaktif seperti *PhET Simulations* terbukti efektif digunakan untuk meningkatkan kemampuan pemahaman dalam pembelajaran matematika di sekolah dasar.

Kata Kunci: *Project Based Learning*, *PhET Simulations,* Kemampuan Pemahaman matematis, Peserta Didik Sekolah Dasar.

THE EFFECT OF THE PROJECT BASED LEARNING (PjBL) MODEL ASSISTED BY PHET SIMULATIONS THE ABILITY TO UNDERSTAND MATHEMATICAL IN ELEMENTARY SCHOOL STUDENTS

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ABSTRACT

This study was motivated by the low level of mathematical understanding and learning interest among elementary school students. The purpose of this research is to examine the effect of the Project Based Learning (PjBL) model assisted by PhET Simulations on students' mathematical understanding abilities at SDN 075 Jatayu Bandung. The research employed a quantitative approach with a quasi-experimental method and a Nonequivalent Control Group Design. The study involved two classes: class IV C as the experimental group and class IV A as the control group. Data collection techniques included mathematical understanding tests in the form of pretests and posttests, observation sheets, and documentation.
Data analysis was conducted using IBM SPSS Statistics 29 software, through stages including normality testing, homogeneity testing, hypothesis testing using the Independent Sample t-Test, the Mann-Whitney test, and effect size calculation.The results of the study showed an improvement in students' mathematical understanding using both the Project Based Learning (PjBL) model assisted by PhET Simulations and conventional teaching methods. However, the Mann-Whitney test revealed a significant difference in the level of influence on mathematical understanding between the experimental and control groups. The effect size test indicated that the application of the PjBL model assisted by PhET Simulations had a moderate effect on students' mathematical understanding.
Therefore, the Project Based Learning (PjBL) model, when combined with interactive media such as PhET Simulations, has been proven effective in enhancing mathematical understanding in elementary school mathematics learning.

Keywords: Project Based Learning, PhET Simulations, Ability to Understanding Mathematical, Elementary School Students.

PANGARUH MODEL PEMBELAJARAN BERBASIS PROYEK DIBANTUAN KU *PHET SIMULATIONS* KANA KAMAMPUH PAMAHAMAN MATEMATIS MURID DI SAKOLA DASAR

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RINGKESAN

Kasang tukang diayakeun panalungtikan ieu nyaeta ku handapna kamampuh pamahaman jeung minat diajar matematis peserta didik di sakola dasar. Tujuan tina panalungtikan ieu nyaéta pikeun nyaho pangaruh model *Project Based Learning* (PjBL) nu dibantuan ku *PhET Simulations* kana kamampuh pamahaman matematis peserta didik di SDN 075 Jatayu Bandung. Pendekatan nu dipaké nyaéta pendekatan kuantitatif kalayan métode eksperimen tipe quasi eksperimen jeung desain *Nonequivalent Control Group Design*. Panalungtikan ieu ngalibetkeun dua kelas, nyaéta kelas IV C minangka kelas eksperimen jeung kelas IV A minangka kelas kontrol. Teknik ngumpulkeun data dilakukeun ngaliwatan tés kamampuh pamahaman matematis dina bentuk *pretest* jeung *posttest*, lambaran observasi, jeung dokumentasi. Analisis data dilakukeun maké aplikasi IBM SPSS Statistics 29, kalawan léngkah-léngkah uji normalitas, uji homogenitas, uji hipotesis maké *Independent Sample t-Test* jeung uji *Mann-Whitney*, sarta uji *effect size*.Hasil panalungtikan nunjukkeun ayana paningkatan kamampuh pamahaman matematis dina peserta didik nu diajar ngagunakeun model *Project Based Learning* (PjBL) dibantuan ku *PhET Simulations*, ogé dina nu diajar maké modél konvensional. Hasil uji *Mann-Whitney* nunjukkeun yen aya bédana pangaruh nu signifikan antara kelas eksperimen jeung kelas kontrol. Hasil uji *effect size* ngindikasikeun yén modél *Project Based Learning* (PjBL) nu dibarengan ku *PhET Simulations* mibanda pangaruh sedeng kana kamampuh pamahaman matematis peserta didik. Ku kituna, model *Project Based Learning* (PjBL) nu dipadukeun jeung média interaktif sapertos *PhET Simulations* kabuktian éféktif dipaké pikeun ningkatkeun kamampuh pamahaman dina diajar matematika di sakola dasar.

Kecap Pamageuh: Pangajaran Berbasis Proyek, *PhET Simulations*, Kamampuh Pamahaman Matematis, Murid Sakola Dasar.