

ABSTRAK

Lumban Gaol, Maju. (2007). Pengaruh Model Pembelajaran Dan Penalaran Formal Terhadap Kompetensi Daya Cipta Produk Elektronika. Tesis, Program Studi Teknologi Pendidikan, Pasca Sarjana Universitas Negeri Medan.

Penelitian ini bertujuan untuk mengetahui perbedaan kompetensi daya cipta produk elektronika antara model pembelajaran berbasis simulasi komputer dibandingkan dengan model pembelajaran eksperimen laboratorium dan mengetahui perbedaan kompetensi daya cipta produk elektronika antara mahasiswa yang memiliki tingkat penalaran formal tinggi dan rendah, serta mengetahui interaksi antara model pembelajaran dengan penalaran formal terhadap kompetensi daya cipta produk elektronika dari mahasiswa pada mahasiswa pendidikan teknik elektro Universitas Negeri Medan

Penelitian ini dilakukan pada mahasiswa jurusan pendidikan teknik elektro Fakultas teknik Universitas Negeri Medan tahun ajaran 2005/2006 terhadap kompetensi daya cipta produk elektronika, populasi penelitian adalah seluruh mahasiswa pendidikan teknik elektro angkatan tahun 2005 yang berjumlah 63 orang. Teknik pengambilan sampel digunakan dengan *Cluster Random Sampling Cluster Random Sampling* berdasarkan penalaran formal mahasiswa, sehingga sampel penelitian ini pada kelompok pembelajaran masing masing terdiri 20 orang. Metode penelitian yang digunakan adalah quasi eksperimen dengan desain faktorial 2×2 . Teknik analisis yang digunakan adalah analisis varian dua jalur (*Two Way Anava 2 x 2*) dengan taraf signifikansi $\alpha = 0,05$ dengan menggunakan Uji-F, pengujian uji lanjut menggunakan uji Tukey.

Temuan penelitian menunjukkan (1) Terdapat perbedaan kompetensi daya cipta produk elektronika yang signifikan antara model pembelajaran berbasis simulasi komputer dengan dengan model pembelajaran laboratorium pada taraf kepercayaan pada taraf kepercayaan $\alpha = 0,05$ dengan F_h sebesar 20,33 dan charge Tabel F_t untuk taraf signifikansi α sebesar 0.05 adalah 3,94 dengan derajat kebebasan $dk(1; 19)$ didapat $F_h(20,33) > F_t(3,94)$. Dengan menggunakan *Uji Tukey* diperoleh $Q_{tabel} = 3,96$ untuk taraf signifikansi $\alpha(0,05)$, sedangkan hasil perhitungan $Q_h = 6,50$. maka didapat $Q_{hitung}(6,50) > Q_{tabel}(3,96)$, maka secara keseluruhan mahasiswa pendidikan teknik elektro Universitas Negeri Medan yang mengikuti pembelajaran dengan model pembelajaran berbasis simulasi komputer (Psim) memperoleh kompetensi daya cipta produk elektronika yang lebih baik dibandingkan dengan mahasiswa yang diajar dengan menggunakan Model pembelajaran Laboratorium (Plab), (2) Terdapat perbedaan Kompetensi Daya Cipta Produk Elektronika Antara Mahasiswa dengan Penalaran Formal tinggi dan Penalaran Formal rendah, pada taraf kepercayaan $\alpha=0,05$ dengan harga hitung $F_h = 12,15$ dan harga tabel F_t untuk $\alpha = 0,05$ dengan $dk = (1; 19)$ diperoleh $F_{0,05(1,19)} = 3,94$ sehingga dapat dinyatakan bahwa $F_h(12,15) > F_t(3,94)$ dengan menggunakan *Uji Tukey* didapat diperoleh $Q_{tabel} = 3,94$ untuk taraf

signifikansi $\alpha_{(0,05)}$, hasil perhitungan $Q_h = 5,43$. maka didapat $Q_{hitung} (5,43) > Q_{tabel} (3,96)$ sehingga disimpulkan bahwa mahasiswa pendidikan teknik elektro Universitas Negeri Medan yang memiliki penalaran formal tinggi akan lebih baik kompetensi daya cipta produk elektronika dibandingkan dengan kompetensi daya cipta produk elektronika mahasiswa yang mempunyai penalaran formal rendah. (3) Terdapat interaksi antara model pembelajaran dan penalaran formal mahasiswa terhadap kompetensi daya cipta produk elektronika mahasiswa di jurusan pendidikan teknik elektro Universitas Negeri Medan, diperoleh $F_h = 42,96$ dan harga tabel F_t untuk taraf kepercayaan (α) sebesar 0,05 dengan dk (1;16) adalah $F_{t(0,05)(1,16)} = 3,94$ sehingga dapat dinyatakan $F_h (42,96) > F_t (3,94)$. Dengan kata lain semakin baik suatu model pembelajaran yang digunakan dalam menyampaikan materi ajar elektronika, maka semakin tinggi kompetensi daya cipta produk elektronika dari mahasiswa, atau semakin tinggi penalaran formal mahasiswa dengan model pembelajaran yang sesuai dengan pengembangan kompetensi, maka semakin tinggi pencapaian kompetensi yang diperoleh mahasiswa. Interaksi antara model pembelajaran dan penalaran formal akan memberikan efek yang tinggi dalam penguasaan kompetensi daya cipta produk elektronika semakin tinggi.. Akan tetapi pengaruh model pembelajaran lebih banyak memberikan pengaruh terhadap peningkatan kompetensi mahasiswa dibandingkan dengan penalaran formal.



ABSTRACT

Lumban Gaol, Maju. (2007). *The Effect Of A Computer Simulation Teaching Model On Laboratories Based and Formal Reasoning On Competency In Elektronik Product Creativity.* The thesis, the Study Program of educational Technology, Postgraduate the Medan State University

The purpose of this study was to compare the effect of a computer simulation activity versus a laboratories activity on students' competency in electronic product creativity. This research aimed at knowing the difference of competency in elektronik product creativity between the teaching model was based on the simulation of the computer compared with the teaching model the laboratory experiment teaching model the and knew the difference of competency in elektronik product creativity between the student who had the level of formal reasoning high and low, as well as knew the interaction between the teaching model and formal reasoning towards competency in elektronik product creativity from the student to the student of electrical engineering education of Medan State University

This research was carried out to the student the route Medan education of electrical engineering of the State University Engineering Faculty the academic year 2005/2006 towards competency in electronic product creativity, the research population was all the student of education of generation electrical engineering in 2005 that was numbering 63 people. Technically the taking of the sample was used with Cluster Random Sampling Cluster Random Sampling was based on formal reasoning the student, so as the sample of this research to the treatment group consisted 20 people. The research method that was used was quasi the experiment with the design faktorial 2×2 . Used Test-F, the testing of the continued test used the Tuckey test Technically the analysis that was used was the analysis of variant of two way (Two Way Anova faktorial 2×2) with the level of the significance $\alpha = 0.05$ with.

The research findings showed (1) was gotten by the difference of competency in electronic product creativity that was significant between the teaching model was based on the computer simulation and with the laboratory teaching model in the significance level 0,05. with $F_h = 20.33$ and the amount of the Table F_t for the level of the significance $\alpha = 0.05$ is 3.94 with the level of the freedom $dk (1; 19)$ was gotten by $F_h (20.33) > F_t (3.94)$. By using the Tukey Test was received by $Q_{table} = 3.96$ for the level of the significance $\alpha (0.05)$, whereas results of the calculation of $Q_h = 6.50$ were gotten by $Q_{observasi} (6.50) > Q_{tabel} (3.96)$, then on the whole the Medan student of education of State University electrical engineering that followed teaching with the model teaching was based on the simulation of the computer (Psim) received competence of the competency in electronic product creativity that was better compared with the student who was taught by using Laboratory teaching model (Plab), with $\alpha = 0.05$ and counted $F_h = 12.15$, and the amount of the table F_t to $\alpha = 0.05$ with $dk = (1; 19)$ was received $F_{0.05} (1; 19) = 3.94$ so as stated that $F_h (12.15)$ was gotten by the difference of bettween competency in electronic product creativity the Student and Formal Reasoning high and Formal

Reasoning low, in the level of the belief $> F_t$ (3.94) by using the Tukey Test was gotten was received by $Q_{table} = 3.94$ for the level of the significance α (0.05), results of the calculation of $Q_h = 5.43$. Then was gotten by $Q_{calculate} (5.43) > Q_{table} (3.96)$ so as to be concluded that the Medan student of education of State University electrical engineering who had formal reasoning high will be better competency in electronic product creativity compared with competence competency in electronic product creativity of the student's electronics that had formal reasoning low, (3) was gotten by the interaction between the teaching model and formal reasoning the student towards competence the inventiveness of the product of the student's electronics in the Medan route of education of State University electrical engineering, was received by $F_h = 42.96$ and the price of the table F_t for the level of the belief (α) of 0.05 with dk (01:16) was $F_t (0.05) (1,16) = 3.94$ so as to be able to be stated by $F_h (42.96) > F_t (3.94)$. In With words increasingly good a teaching model that was used in sending material taught electronics, then increasingly high competence of the inventiveness of the electronic product from the student, or increasingly high formal reasoning the student with the teaching model that in accordance with the development of competence, then increasingly high the achievement of competence that was received by the student. The interaction between teaching model and formal reasoning will give the effect that was high in the command competence of the inventiveness of the electronic product was increasingly high. But the influence of the teaching model more often gave the influence on the increase in the student's competence compared with formal reasoning.

