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Faraday's law

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The development of a Structure Discovery on Faraday's law

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Abstract- This study was intended in educated achievement comparison between the conventional strategies and the instructive discovery by the assumption that the students who learned the instructive earned higher scored in knowledge and comprehensive level than those who learned from the conventional method. The working from studying the conventional method in the faraday's law content and developed to be the instructive discovery. The instructive discovery was approved by 5 contents experts in rightness and completeness of contents. The after working was developing the test items and observation sheets. This study revealed that the student learned from the instructive discovery and the conventional teaching strategies by themselves. The overall achievement level was at a significant difference of 0.01.

I. INTRODUCTION

The instructors usually give lecture to students or solve problems in front of the classroom so that students can learn how to imitate and do exercises at the end of each chapter. This kind of teaching aims at giving more knowledge to students so that they have to learn a lot and they are forced to remember. However, to gain higher understanding and idea and to solve problems require the application of various teaching methods so that learners can use brains to tackle with the contents and develop understanding inside the learners. Therefore, the researchers would like to conduct a comparative study of academic achievement between conceptualization teaching approach and conventional teaching approach on the topic of the design of the pneumatic control in a programmable logic controller in order to develop the knowledge and understanding of students.

In this study on the comparative study of academic achievement between conceptualization and conventional teaching approaches on the topic of the design of the Faraday's Law into 2 groups: Group 1 was the experimental group while Group 2 the control group. Their academic achievement would be compared.

This article will present the results from the comparative study of academic achievement between

conceptualization and conventional teaching approaches on the topic of the design of the pneumatic control in a programmable logic controller. The students were divided into 2 groups: Group 1 was the experimental group while Group 2 the control group. Their academic achievement would be compared.

II Methodology.

2.1 A test about previous knowledge in the design of the pneumatic control in a Faraday's Law was given to students from both experimental and control groups until students from both groups passed 80% requirement.

2.2 The pretest of 40 questions with 4 multiple choices was given to both experimental and control group.

2.3 The experimental group was taught in accordance with conceptualization teaching approach whereas the control was given conventional teaching approach.

2.4 The posttest was given as a learning achievement and this was the same pretest but the items and choices were rearranged for both experimental and control groups.

2.5 The data were analyzed and the score from both groups was compared with previous knowledge, learning achievement, and behavior through t-test statistical technique. Both groups were independent. Previous knowledge and learning achievement were compared using one-way t-test technique.

3. Results

According to the research results from the comparative study of academic achievement between conceptualization and conventional teaching approaches through the academic achievement test of 40 questions with 4 multiple choices, the score was measured by t-test statistical method for 2 independent groups. It was found that students from experimental and control

groups showed different academic achievement at the statistical significance of 0.01 level. This means that students from the experimental group showed higher academic achievement than those from the control group. Conceptualization teaching approach could help students from the experimental group gain higher academic achievement than conventional teaching approach.

Table 1 Comparison of learning achievement between the experimental and control groups

Sampling group	N	\bar{X}	S.D.	t-value
Experimental group	20	16.25	1.78	-3.12
Control group	20	18.35	2.43	

According to the analysis of the data from Table 1, it was found that the value was statistically significant (0.01, df = 38). The t value from the table was 2.457 and the t value from calculation was -3.12. This means that the experimental group and the control group had statistically significant difference for their learning achievement.

Table.2 shows the mean, standard deviation and t-test value for the learning achievement pretest of the experimental group.

Experimental group	N	\bar{X}	S.D.	t-value
Pretest	20	16.25	1.78	-13.68
Posttest	20	23.35	1.49	

According to the analysis of Table 2, it was found that the t value was statistically significant (0.01, df = 38). The t value from the table was 2.457 whereas the t value from the calculation was -13.68. This means that the learning achievement from pretest and posttest for the experimental group was statistically significant. Students with principle teaching approach showed higher learning achievement.

Table.3 shows the mean, standard deviation and t-test value for the learning achievement pretest of the control group.

Control group	N	\bar{X}	S.D.	t-value
Pretest	20	18.56	2.49	-4.45
Posttest	20	21.85	1.41	

According to the analysis of Table 3, it was found that the t value was statistically significant (0.01, df = 38). The t value from the table was 2.457 and the t value from calculation was -4.47. This means that the learning achievement for pretest and posttest of the control group was statistically significant. Students with conventional teaching approach showed difference in their pretest and posttest learning achievement.

Table.4 shows the mean, standard deviation and t-test of the posttest learning achievement for both experimental and control groups.

Sampling group	N	\bar{X}	S.D.	t-value
Experimental group	20	23.36	1.49	3.48 **
Control group	20	21.95	1.35	

** Statistically significant at the 0.01 level

According to the analysis of Table 4, it was found that the t value was statistically significant (0.01, df = 38). The t value from the table was 2.458 whereas the t value from calculation was 3.48**. This means that the learning achievement for posttest of the experimental group and the control group was statistically significant. In other words, the students with principle teaching approach showed higher learning achievement than students with conventional teaching approach.

Table.5 shows the mean, standard deviation, t-test value of posttest learning achievement of experimental and control groups as classified by learning behaviors

Learning behaviors	Experimental group			Control group			t-value
	N	\bar{X}	S.D.	N	\bar{X}	S.D.	
Memory	20	17.7	1.7	20	13.3	2.5	-3.487 **
Understanding	20	17.2	2.4	20	12.8	4.2	-2.016
Application	20	17.5	2.9	20	13.8	3.4	-2.914 **

** Statistically significant at the 0.01 level

According to the analysis of Table 5, it was found that the t value was statistically significant (0.01, df = 38). The t value from the table was 2.457 while the t values from calculation were -3.497, -2.015 and -2.814 according to learning behaviors as in memory, understanding and application. The mean of the experimental group was higher than the mean of the control group. This means that students with principle teaching approach showed higher learning achievement on the topic of a logic gate than students with conventional teaching approach.

4. Conclusion

According to the research on academic achievement between conceptualization and conventional teaching approaches on the topic of the design of the pneumatic control in a programmable logic controller through the academic achievement test containing 40 questions with 4 multiple choices, the score was analyzed by independent samples t-test statistical method. It was found that the students from the experimental and control groups showed difference in their academic achievement of posttest with statistical significance at

the 0.01 level. This means that the students from experimental group showed higher academic achievement for posttest than the students from control group. The conceptualization teaching approach could help students gain higher academic achievement than the conventional teaching approach.

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