



De La Salle University – Dasmariñas
GRADUATE PROGRAM

THE EFFECTS OF VIDEOTAPES ON TEACHING SELECTED TOPICS
IN SCIENCE AND TECHNOLOGY IV AT NEW ERA
NATIONAL HIGH SCHOOL TOWARDS THE
DEVELOPMENT OF HIGHER-ORDER
THINKING SKILLS

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Master of Arts in Education
Major in Educational Management

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ABSTRACT

Name of Institution: De La Salle University- Dasmariñas

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Title: **The Effects of Videotapes on Teaching Selected Topics in Science and Technology IV at New Era**

National High School Towards the Development of Higher-Order Thinking Skills

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STATEMENT OF THE PROBLEM

This study attempted to ascertain the Effects of Videotapes on Teaching Selected Topics in Science and Technology IV at New Era National High School towards the Development of Higher-Order Thinking Skills (HOTS) among fourth year high school students, during the school year 2004-2005.



It tried to answer these specific questions:

1. What are the mean scores of the experimental group and control group in the pretest in terms of HOTS: application, analysis, synthesis and evaluation?

1.1 Is there a significant difference between the mean scores of the two groups in the specified higher- order thinking skills?

2. What are the mean scores of experimental group and control group in the posttest in terms of HOTS: application, analysis, synthesis, and evaluation?

2.1 Is there a significant difference between the mean scores of both groups in the specified higher-order thinking skills?

3. What is the percentage gain in terms of HOTS based on the results of the pre and post tests in the experimental /control groups?

4. What is the level of proficiency of both groups in terms of the mean scores in the posttest on the following skills:

4.1 application;

4.2 analysis;

4.3 synthesis; and

4.4 evaluation?



SCOPE AND COVERAGE

This study was limited only to the effects of videotapes on teaching selected topics in Science and technology IV at New Era National High School, Dasmariñas, Cavite towards the development of Higher-Order Thinking Skills during the school year 2004-2005. It started from July 2004 and ended last October 2004.

METHODOLOGY

The study utilized the quasi-experimental method with pretest-posttest non-equivalent group experimental design. The statistical tools applied in the study were mean, percentage, standard deviation, and T-test for independent sample means.

MAJOR FINDINGS

1. In the application level, the mean score of the experimental group (5.93) was slightly higher than the mean score of the control group (5.47). The standard deviation of the first group was 2.02, slightly higher than that of the second group (1.98). This could indicate that in the experimental group, the individual scores were more slightly spread out than in the control group in relation to the mean. In the analysis level, the mean score of the experimental group (5.49) was higher than the mean score of the control group (3.81). The standard deviation of the first group was 1.97, slightly higher than that of the second group (1.64). In the synthesis level, the mean score of the



experimental group (3.93) was slightly higher than the mean score of the control group (3.13). The standard deviation of the first group was 1.54, slightly higher than that of the second group (1.26). In the evaluation level, the mean score of the experimental group (4.41) was much higher than the mean score of the control group (2.62). The standard deviation of the first group (2.02) was higher than that of the second group (1.14).

Overall, the mean score of the experimental group in the four (4) HOTS was 4.94 and its standard deviation, 1.89; the control group had a mean score of 3.76 and a standard deviation of 1.51. Although the performance of the experimental group in HOTS was higher than the control group. The individual skills of the students tended to be more dispersed in relation to the mean.

2. In the application level, a comparison of the mean scores of the experimental and the control groups had no significant difference since the t-values of 1.46 (experimental) and 1.46 (control) were less than ($<$) the critical value of 1.96 using 158 and 155 degrees of freedom. The findings revealed that the two groups did not differ significantly in their mean scores and they were statistically equivalent in relation to the application level. In the analysis, synthesis, and evaluation levels, the experimental and the control groups showed significant difference since the t-values of 5.89, 3.63 and 7.00 respectively (experimental) using 158 degrees of freedom and 5.82, 3.59 and



6.77 (control) using 115, 143 and 143 degrees of freedom (df) were respectively greater than ($>$) the critical value of 1.96. These findings showed the 2 groups had the same level of HOTS as far as prior knowledge on selected topics in Science and Technology IV was concerned.

In view of these, the null hypothesis of no significant difference in the mean scores of the experimental and control groups was **accepted** for the application level and **rejected** for the analysis, synthesis, and evaluation levels.

3. In the application level, the mean score of the experimental group (9.41) was higher than the mean score of the control group (8.68). This could be probably due to the positive effect of videotapes which showed application of concepts in everyday life. The standard deviation of the first group was 2.35 which was almost the same as that of the second group (2.34), a fact that could indicate that the development of application skill in both groups was practically the same. In the analysis level, the mean score of the experimental group (9.93) was higher than the mean score of the control group (8.89). This result signified a deeper understanding of the concepts taught which was enhanced by the videotape viewing. The standard deviation of the first group was also 2.48, slightly higher than that of the second group (2.35), which might be explained by the greater variance in HOTS even within the experimental group sustained by using videotapes in teaching. In the



synthesis level, the mean score of the experimental group (7.80) was slightly higher than the mean score of the control group (7.47). This could mean that both approaches were effective in developing the synthesis skills of the students. The standard deviations of the first group (2.11), slightly higher than that of the second group (1.94), could indicate that both groups were really good in this level. In the evaluation level, the mean score of the experimental group (10.41) was much higher than the mean score of the control group (8.44). This revealed that using videotapes was really effective in developing this skill. The standard deviation of the first group (2.70) was slightly much higher than that of the second group (2.50), which might be probably explained by the almost uniform distribution of score of both groups as far as the evaluation skill was concerned, notwithstanding the use of videotapes in the experimental group.

Overall, the mean score of the experimental group in the four (4) HOTS was 8.90 and its standard deviation 2.41 indicated that this group performed slightly better than the control group with a mean score of 8.87 and a standard deviation of 2.28.

4. At the application and synthesis levels, a comparison of the mean scores of the experimental and the control groups revealed no significant difference since the t-value of 1.97 and 1.03 (experimental) using 158 degrees of freedom and 1.97 and 1.03 (control) were less than ($<$) the



critical value of 1.96 using 155 and 151 degrees of freedom. The findings revealed that the two groups did not differ significantly in performance and they were statistically equivalent in relation to the application and synthesis levels. This could indicate that both approaches to teaching Science and Technology IV were effective in developing these levels.

In the analysis, and evaluation levels, the experimental and the control groups showed a significant difference since the t-values of 2.72 and 4.80 (experimental) using 158 degrees of freedom and 2.71 and 4.81 (control) using 153 and 151 degrees of freedom (df) were greater than (>) the critical value of 1.96. The data showed that the post-test mean scores of the 2 groups had the same results indicating the same level of HOTS in selected topics in Science and Technology IV concerned.

In view of these, the null hypothesis of no significant difference in the mean scores of the experimental and control groups was **accepted** for the application and synthesis levels and **rejected** for the analysis and evaluation levels.

Overall, the average t-values of the experimental and control groups showed a significant difference since the t-value of 2.63 using 158 degree of freedom (df) was greater than the critical value of 1.96. The results indicated that videotapes were effective in the development of Higher-Order Thinking Skills of the students compared to the traditional approach in teaching some



selected topics in Science and Technology IV.

5. For the experimental group, the percentage gain in the scores in HOTS were the following: Application, 23.20%; Analysis, 29.60%; Synthesis, 25.78 %; and Evaluation, 40.00 %. For the control group, the percentage gains in the scores in HOTS were the following: Application, 21.41%; Analysis, 33.88%; Synthesis, 28.94%; and Evaluation, 38.75%. Higher gain was registered in the application and evaluation levels for the experimental group. This could be probably due to the visual impact of the tapes. Analysis and synthesis levels registered a higher gain in the control group. Abstract thinking was further developed in this group due to some experiments performed which led the control group to discover, analyze, and synthesize the given concepts.

6. Data showed that the level of proficiency in the application skill for the experimental group was 9.41 (average) while for the control group, 8.68 (average). In the analysis skill, the experimental group had 9.93 (average) the control group had 8.89 (average). In the synthesis skill, the level of proficiency was 7.80 (average) for the experimental group and 7.47 (average) for the control group. This means that whether videotape or traditional approach to teaching Science and Technology IV was used, both groups had the same level of proficiency in application, analysis, and synthesis. However, in evaluation, the level of proficiency was 10.41 (High) for the experimental



group and 8.43 (average) for the control group. This could indicate that videotape presentations were effective in developing evaluation skill of the students compared with the traditional approach to teaching Science and Technology IV because visual images created a clearer impact on the students than plain words.

The results indicated that the students in the experimental and control groups had an average level of proficiency with regard to application, analysis, and synthesis but scored high in the evaluation level after the intervention. These further showed that there was higher mean gain in learning after instruction with or without the use of videotape.

Conclusions

On account of the foregoing findings, the following conclusions were drawn:

1. Students performed better in analysis, synthesis, and evaluation levels even before the use of videotapes in specific lessons in Science and Technology IV based on the pretest results.

2. The experimental and control groups had the same posttest performance in the application and synthesis levels. But, the experimental group performed better at the analysis and evaluation levels.

3. Students in the control group had a greater percentage gain at the analysis and synthesis levels based on pre and posttest results.



4. The level of proficiency of both groups in the application, analysis, and synthesis skills was average but high average in the evaluation skill for the experimental group.

5. Instructions using both the traditional approach and videotape developed the students Higher-Order Thinking Skills in Science and Technology IV.

RECOMMENDATIONS

1. Science and Technology IV teachers should complement the traditional approach of teaching with videotape instructions to develop further the Higher-Order Thinking skills of fourth year students in the aforesaid learning area.

2. Secondary school administrators and Science department heads should exert efforts to make videotapes available to promote the development of HOTS in students.

3. More videotape lessons should be prepared for other topics in Science and Technology IV.

4. A similar investigation should be conducted for a longer period of time using more videotape lessons.

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TABLE OF CONTENTS

	PAGE
TITLE PAGE	1
ABSTRACT	2
APPROVAL SHEET	12
ACKNOWLEDGMENTS	13
TABLE OF CONTENTS	15
LIST OF TABLES	18
LIST OF FIGURES	19
CHAPTER	
1. THE PROBLEM AND ITS BACKGROUND	70
Introduction	20
Theoretical Framework/Conceptual Framework	23
Statement of the Problem	27
Hypotheses	28
Scope and Delimitation of the Study	29
Significance of the Study	33
Definition of Terms	34
2. REVIEW OF RELATED LITERATURE	93
Conceptual Literature	38



Research Literature	49
Synthesis	60
3. METHODOLOGY	
Research Design	62
Population and Sampling	62
Respondents of the Study	63
Research Instrument	63
Validation of the Instrument	64
Data Gathering Procedure	65
Statistical Treatment of Data	68
4. PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA	
Problem No.1	70
Problem No.2	73
Problem No.3	77
Problem No.4	79
5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	
Summary	82
Conclusions	91
Recommendations	92
REFERENCES	93

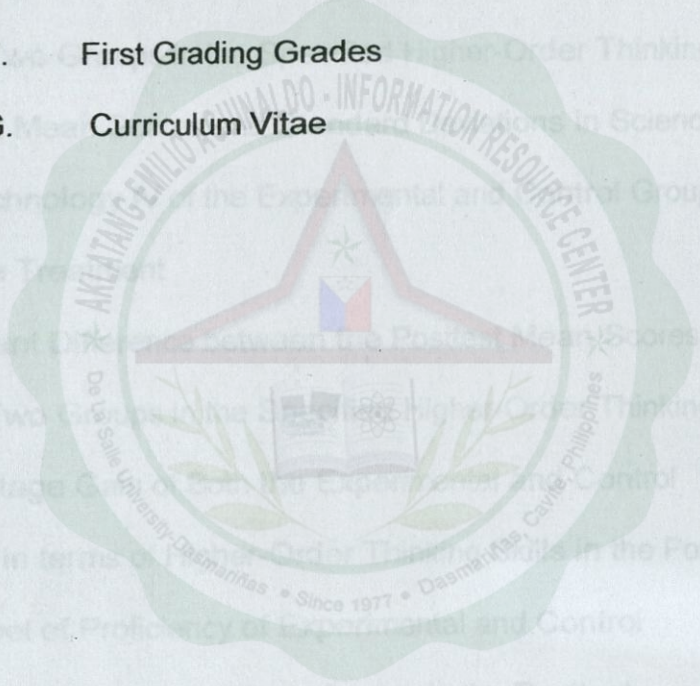


APPENDICES

LIST OF TABLES

Page

Table		Page
	A. Letter of Request	98
1	B. Teacher-Made Instrument	101
	C. Table of Specification	135
	D. The Instrument	136
2	E. Sample Lesson Plans	156
	F. First Grading Grades	162
3	G. Curriculum Vitae	163
4	Significant Difference between Posttest Mean Scores of the Two Groups in Terms of Higher Order Thinking Skills	77
5	Percentage Gain of the Experimental and Control Groups in terms of Higher Order Thinking Skills in the Posttest	79
6	The Level of Proficiency of Experimental and Control Groups in Terms of the Mean Scores in the Posttest	81





LIST OF TABLES

Table		Page
1	Pretest Mean Scores and Standard Deviations in Science and Technology IV of the Experimental and Control Groups before the Treatment	71
2	Significant Difference between the Pretest Mean Scores of the Two Groups in the Specified Higher-Order Thinking Skills	73
3	Posttest Mean Scores and Standard Deviations in Science and Technology IV of the Experimental and Control Groups after the Treatment	75
4	Significant Difference between the Posttest Mean Scores of the Two Groups in the Specified Higher-Order Thinking Skills	77
5	Percentage Gain of Both the Experimental and Control Groups in terms of Higher-Order Thinking Skills in the Posttest	79
6	The Level of Proficiency of Experimental and Control Groups in Terms of the Mean Scores in the Posttest	81



LIST OF FIGURES

Figure		Page
1	Paradigm of the Study	26
2	Respondents of the Study	64
3	Table of Specifications	135
4.	First Grading Grades in Science and Technology IV	162

