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A Survey of the Attitudes of Industrial Arts Teachers in the City of Norfolk, Virginia toward the IACP Approach to Teaching Industrial Arts

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A Survey of the Attitudes of Industrial Arts Teachers in the City of Norfolk, Virginia toward the IACP Approach to Teaching Industrial Arts

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Approval Page

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Approved by: John M. Ritz

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George D. Chastain

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LIST OF TABLES

CHAPTER I

INTRODUCTION

The curriculum for any school system is very important. A lot of thought must be put into the final decisions for content selection and then time allotted for revision as the curriculum is implemented in the schools.

In industrial arts, the problem is complicated even more by the costs involved in making any change in the curriculum. A normal classroom is generally unsuited for the use of the machines necessary to perform any of the general industrial arts tasks. Often the environment must be altered to fit the needs of the program. Some money for these alterations often comes from the federal government. Many of these alterations are necessary to try to provide the students with a saleable skill so that they can enter the world of work. The skills often needed come from vocational education programs.

President John F. Kennedy appointed a Panel of Consultants in Vocational Education in 1961 to study whether more funds were needed in the area of vocational education. This study showed that "approximately eighty percent of the students now starting out in the first grade will never complete four years of college.[1]" The results of the study made by the panel of consultants led to the passage of the Vocational Education Act of 1963. Since this act was passed, the Congress of the United States has repeatedly put out

funds to pay for research projects to help the students find a job entry skill before graduation or dropping out of high school.

A number of industrial arts research projects that have been funded by the Congress of the United States and have proven successful in some states are:

1. The Maryland Plan
2. The American Industry Project
3. The Industrial Arts Curriculum Project

This research paper will focus on the Industrial Arts Curriculum Project since it has been adopted by the state of Virginia and is currently being taught in many cities throughout the state. This researcher will try to discover the attitudes of the teachers of industrial arts in the City of Norfolk, Virginia, toward what the state obviously believes is a valid program for school children.

THE PROBLEM

The problem of this study was to determine Norfolk industrial arts teachers attitudes toward the Industrial Arts Curriculum Project.

RESEARCH QUESTIONS

In the hope of solving the above problem, the following questions were researched:

1. What is the Industrial Arts Curriculum Project?
2. What are teacher attitudes toward the Industrial Arts Curriculum Project approach to teaching industrial arts?

BACKGROUND AND SIGNIFICANCE

"The Industrial Arts Curriculum Project was a curriculum development program headquartered at Ohio State University in cooperation with the University of Illinois.[2]" The program was set up for junior high school students and first demonstrated at six evaluation centers across the United States during the 1969-1970 school year. The course that was demonstrated the first year was the 'World of Construction' followed the next year by the 'World of Manufacturing'.

Three years after the first commercially prepared Industrial Arts Curriculum Project courses were made available, the state of Virginia began the process of adoption of the Industrial Arts Curriculum Project approach to teaching industrial arts to junior high school students. Since the state has come out so highly in favor of the program, one cannot help but wonder why the City of Norfolk has not put more of the programs into their curriculum. Attitudes of teachers often have a high degree of significance when a new program of study is introduced. This researcher has tried to delve into the attitudes of the Norfolk industrial arts teachers toward this new approach.

ASSUMPTIONS

It is assumed that all industrial arts teachers in the City of Norfolk, Virginia, could be certified to teach the Industrial Arts Curriculum Project approach to teaching industrial arts. Because of the fairly recent development of this approach, some of the teachers

would need college courses concerning the Industrial Arts Curriculum Project in order to be certified.

Recently, there have been many new industrial arts teachers because of the high turnover rate to industry. These new teachers are better acquainted with the Industrial Arts Curriculum Project approach to teaching industrial arts because of its recent introduction at the college level, and could consequently teach this approach.

LIMITATIONS

The limitation of this research paper is that the survey was made only of the industrial arts teachers in the secondary schools of Norfolk's public school system.

LIST OF TERMS

Curriculum--course of study or set of courses of study in a school.

Conventional students--students who follow an established course of study.

Innovative programs--new ways of teaching that are supposed to be an improvement over the conventional.

Industrial Arts Curriculum Project--an innovative program developed by Ohio State University consisting of the World of Construction and World of Manufacturing.

PROCEDURES

In order to obtain an accurate view of the attitudes of the industrial arts teachers toward teaching the Industrial Arts Curriculum Project approach to industrial arts in the Norfolk city schools, each

industrial arts teacher was telephoned by this researcher and asked to state their views toward several questions (see Appendix A). A brief history of each teacher's background as it pertains to this study was also obtained during the interview.

Information obtained from these interviews was divided into categories as to the number of years taught as of June 15, 1979. The number of teachers for, opposed, and undecided about teaching the Industrial Arts Curriculum Project approach was then analyzed.

SUMMARY AND OVERVIEW OF REMAINING CHAPTERS

Chapter One contains an introduction to the problem of the attitudes of industrial arts teachers in the Norfolk City Schools toward industrial arts. This chapter also explains the procedures that were used to delve into the industrial arts teachers' attitudes. The background of the Industrial Arts Curriculum Project is also discussed along with the significance of this research. A list of terms and their definitions as they pertain to this research was also included to help the reader follow the meaning of the researcher.

Chapter Two contains an introduction to the Industrial Arts Curriculum Project approach to teaching industrial arts and a review of the related literature.

Chapter Three contains the procedure, sample and instrumentation. Research data gathered in this study is analyzed in Chapter Four. Finally, Chapter Five contains the summary and conclusions based on research findings and recommendations.

CHAPTER II

REVIEW OF LITERATURE

In 1965, two men, Donald G. Lux and Willis E. Ray, decided to develop a curriculum that was beneficial to the junior high school student as well as the industry that is served by industrial arts. "Funded by the United States Office of Education, and under a special contract, these two men, both professors of Education at Ohio State University, began a project that was projected to end in 1971."[3]

The project staff began its work by derivation of a logically defensable body of industrial knowledge for a suitable curricula. For all practical purposes an adequate definition of industry was necessary. In order to come up with an adequate definition, the total economic system was studied. The results of that study were:

> "that industry is that part of the economic system which provides economic value (form utility) by substantially changing the form of materials."[4]

> "Industry was defined as that substantial element of the economic system which is composed of construction and manufacturing."[5]

Next, a definition for technology was needed. The project staff came up with the definition as "the science of efficient action."[6]

The project staff then set out to develop a program and objectives. The first year was set up to teach seventh and eighth grade students about construction technology. The second year was then set

up to teach eighth and/or ninth grade students about manufacturing technology. This was designed to complete a two-year sequence of study at the junior high school level.

After the initial set up was developed, the project staff had to arrange for an experimental program of study to test their design and engineering. "In the 1966-67 school year, a small scale pilot program was tested in the Cincinnati, Ohio, public schools. The Project was expanded in the 1967-68 school year to testing the first year course in Construction Technology. Three field test centers were set up in Florida, New Jersey and Ohio."[7]

The first revisions in the program were tested in 1968, and the thirty-six week initial course in Manufacturing Technology was tested in six field test centers in six states: California, Florida, Illinois, New Jersey, Ohio, and Texas.

The project's instructional strategy may be described, in brief, as the five following steps:

> "First, the student is provided with a textbook that provides him with concepts and principles.
>
> Second, the student uses a partially programmed workbook which is designed to reinforce the major points covered in the textbook.
>
> Third, to begin each class period, the teacher provides a demonstration, poses a problem or perhaps shows a filmstrip related to the textbook reading.
>
> Fourth, a carefully structured laboratory activity is provided every day to further reinforce the concepts and principles presented.
>
> Fifth, review and testing periods are spaced at appropriate times throughout the year."[8]

The text book readings, although they cover approximately fifty percent of the days, are short and should not take the average student

long to complete.

The World of Construction is the first course where the students learn about construction technology. After studying about construction projects, the students build simulation projects or actual construction projects. The students are involved in actual construction activities. They learn how to bid against each other for construction projects.

"Industrial technology was used as the term to name the body of knowledge of the manufacturing and construction industries. To both at this level, man applies common management, production, and personnel technologies."[9]

The minimum time frame for the class if forty-five minutes with recommended length of fifty minutes. It is scheduled to meet five times per week and a maximum classload is twenth-five students.

The World of Construction is broken down under three major headings: management, personnel, and production. Since management was the first of these three major headings, it was looked at first.

"Under construction management technology there are three subheadings. These subheadings are planning, organizing, and controlling."[10] There is no special order but all have to do with human activities, and may take place at the same time. Each of these subheadings has several sub-activities. Under planning, there is formulating, researching, designing, and engineering. Under organizing there is structuring and supplying. Under controlling there is directing, monitoring, reporting, and correcting.

The first step under planning is formulating a plan. Once the idea has been formulated, the decision must be made as to whether the plan is feasible. The plan then must be researched and the best design to complete the project must be decided on. After selection of a design, the details are considered and this involves the engineering part of planning. After all details are decided on and the whole project is planned to completion, bids go out.

"The next major heading is organizing, with the two subheadings, structuring (forming) and supplying (men and materials)."[11] The structuring comes from figuring what jobs need to be done, the number of men needed for each job, and when, where and with what materials will the job be done. After the structure is set up, the contractor must supply the structured organization with the needed manpower. He then buys the material that is necessary to complete the project.

"Controlling is the third major category."[12] The first subheading under the controlling is directing. This is done by coordinating men and materials. Monitoring is simply what it says. Watching over the job to see that all goes smoothly, inspecting to see that all building codes are followed, etc. "The information given back to those in responsible positions is called reporting."[13] Sometimes a report is that the materials do not meet the standards set forth and so the last step of controlling or correcting comes into play. Correcting could involve simply replacing the nail size by going larger or smaller or it could involve major changes in the design and must be corrected by the architect or engineer.

The next major heading is personnel technology. This includes

what can be done to improve worker morale and thus increase productivity. The category includes hiring, training, working, advancing, and retiring of personnel. Other parts of the personnel technology heading were discussed under planning technology.

The last major heading is construction production technology. "This is the process or practices which are used to change materials on a job site."[14] All production processes can be subdivided into three subdivisions, preprocessing, processing, and postprocessing.

"Under preprocessing, the preparation of materials for processing is the practice of receiving, handling, storing and protection."[15] Since materials continue to arrive throughout the production period, the above practices, or preprocessing, is continually going on. The materials usually have to be counted and then stored to protect them from damage.

The next subheading is processing. There are three other smaller subheadings under processing. They are: "separating (taking away from the material), combining (adding to the material), or forming (changing the arrangement of the material). Any combination of the three above are possible."[16]

The final step in construction production technology is post-processing, divided into four categories. Those categories are: installing, maintaining, repairing, or altering. "Servicing is what these postprocessing practices are commonly called."[17]

The other branch of Industrial Technology is manufacturing technology. This branch is also subdivided into several lesser divisions. In order to discover all there is to know about manufacturing

technology, the system of manufacturing was studied.

Today, the system of manufacturing has three main parts. The first of these three parts is input. "Input is whatever goes into a system. There are six kinds of input to the manufacturing system:

1. Natural resources: the animal, vegetable, and mineral materials of nature.
2. Financing: money in the form of cash or credit (borrowing power),
3. Capital: buildings, machines, equipment, tools,
4. Energy: for example, the energy of falling water, wind, or fuel; electricity, the suns radiation; and atomic energy,
5. Human resources: people, and
6. Knowledge: knowing what to do and how to do it."[18]

The second of the three main parts is process. "A process is an activity that has a purpose or goal."[19] After a process is chosen, it must be tried and tested to make sure that it is the most efficient and skillful. Once it has been "put into daily use it is called a practice. In industry, three kinds of practices are important. The first of these, management practices, making sure everything goes according to plan, decision making."[20]

The second kind of practice is "production practices, changing the forms of natural resources into products to be sold. Some of these practices also are used to service goods when they need maintenance or repair."[21]

The third practice is "personnel practices, making sure that the skills of workers are used in the best way."[22]

The third major heading is output. "Output is whatever comes out of a system."[23] There are two main subheadings that come under output: Durable goods, goods that are meant to last at least three years, and nondurable goods, goods meant to last less than three years."[24]

After looking at the manufacturing system, the technology of manufacturing was discussed and studied. This main heading is subdivided into three kinds of manufacturing technology: Management Technology, Production Technology, and Personnel Technology.

Manufacturing management has six main steps or stages. They are:

1. Identifying (finding out) what consumer wants are;
2. Designing and engineering the product;
3. Planning ways to make the product;
4. Tooling up (getting tools and machines ready);
5. Getting inputs to the system;
6. Setting up production and quality controls."[25]

Under management technology, there are three subheadings: "planning (deciding what work must be done), organizing (getting everything ready for work), controlling (overseeing the work)."[26]

There are two major kinds of planning, long range which plans for the future, five or ten years from the present, and short range planning, for day to day directions and details. "Planning of both kinds is subdivided into four areas, formulating (deciding), researching, designing, and engineering."[27] Decisions must be made as to long and short range goals, or objectives. Policies that will help the company grow must be set up by top level management.

Research (careful hunting for new ideas) is where knowledge is gained. Retrieving knowledge that has already been researched to describe where the company stands and experimenting to see what certain changes will make.

Designing a new product or a change to an old one may be what the company needs in order to grow. Anyone can come up with a new design and then the best one for the job is sent on to engineering.

Under the engineering side of planning, everything is planned as to what will be an acceptable product and what will be thrown out. This part is done by setting up a quality control system.

Organizing (setting up) is the step that can make or break the company. The two main kinds of organizing are: structuring and supplying. Structuring (forming) is the way that the company is set up to get the best product on the market in the shortest time. Supplying is the employing of the number and type of workers to best get the job done. Sometimes it is best to subcontract the job in order to get those particular parts faster for the particular need.

The controlling function is also subdivided into four areas:

> "Directing--supervising and coordinating the work (keeping in the right order),
>
> monitoring--checking or keeping close watch. Inspectors are monitors, inventories are also types of monitoring,
>
> reporting--letting responsible people know if materials are running low or if something does not conform to standards,
>
> correcting--revising (changing) plans so that the project can continue on schedule."[28]

"All technology is aimed at learning how to do something efficiently. The knowledge of efficient practices in manufacturing production is called manufacturing production technology."[29]

Under manufacturing production technology, the goods go through three stages:

> "Preprocessing--ordering and receiving, unpacking, handling, storing, and protecting; the way we get necessary inputs where they are needed when they are needed.
>
> Processing--changing the shape or conditions to an useable product. Materials are changed in form in three basic ways. Materials can be formed, separated, and combined during processing. The practices take place during all stages of production.
>
> Postprocessing--installed (put in its proper place), maintained (kept in good condition), repaired (fixed), or altered (changed). These activities are called servicing."[30]

"Personnel technology is the name given to hiring, training, working, advancing, and retiring workers."[31] Hiring the right person to do a job and then seeing that they are properly trained is an important part of personnel technology. Hiring includes recruiting, selecting and inducting.

When the worker thinks about taking the job, there are three things to think about: wages, hours, and working conditions. Advancement techniques are used to reward those that do very good work. Usually it contains a raise as well as a better working condition. Retirement is the time when one has worked to earn the right to relax and stay at home and still get paid for services rendered in the past.

SUMMARY

In 1965, Donald G. Lux and Willis E. Ray began the process of developing an innovative curriculum for industrial arts. They were under a special contract and received funds from the United States Office of Education. Their staff, which came from different parts

of industry, developed the World of Construction course which was tested in Cincinnati, Ohio, in the 1966-67 school year and the World of Manufacturing which was tested in 1967-68 school year.

Field tests were made across the United States and the final programs were produced commercially in 1970 and 1971, the projected end of the project. The two courses were developed to give the students an insight into the world of industrial technology, and according to Dr. Lux and Dr. Ray, "In general, the World of Construction and the World of Manufacturing have been highly successful programs."[32] They have been altered in many cases to fit the general requirements of the students involved.

CHAPTER III

PROCEDURE FOR THE STUDY

The attitudes of the industrial arts teachers in the City of Norfolk, Virginia, toward teaching the Industrial Arts Curriculum Project approach to industrial arts was the focus of this study. A sample population was identified and an instrument designed to gather information regarding the research questions.

SAMPLE

The sample for this project consists of fifty-six industrial arts teachers in the Norfolk Public School System, thirty-one from junior high schools and twenty-five from senior high schools.

INSTRUMENTATION

In order to find out what each industrial arts teacher's attitude was toward the Industrial Arts Curriculum Project, it was necessary to poll each one. Since there were no questionnaires available, this researcher decided to design a questionnaire that would show the basic attitudes of the industrial arts teachers. The questionnaire (see Appendix A) asked eight basic questions which gave this researcher the data necessary to ascertain the basic attitudes of industrial arts teachers in Norfolk toward the Industrial Arts Curriculum Project.

PROCEDURES

Each teacher in the sample provided information as to the number of years teaching industrial arts, and also their feelings toward the project and willingness to teach the project. Information was divided into two groups, junior high school and senior high school. The data received was first tabulated under these two groups and then the two groups were subdivided into smaller groups according to the variable of years teaching industrial arts. The same data was used to show whether the number of years teaching experience in industrial arts would make a difference as to willingness to teaching the project.

CHAPTER IV

ANALYSIS OF DATA

This chapter contains an analysis of the data obtained in this study. Teachers were separated into two groups to determine whether they were in junior high school or senior high school, and then each of those groups were subdivided according to the number of years teaching industrial arts. The subdivisions were every five years. The results of this division were reported below in Tables 1 through 6. Table 1 asked the question:

"How do you feel about the Industrial Arts Curriculum Project approach to teaching industrial arts?" Thirty-one junior high and twenty-five high school industrial arts teachers responded to this question. They indicated:

TABLE 1

Teacher attitudes toward the project.

Teachers	Number	Good	Undecided	Poor
Junior High School	31	11	14	6
Senior High School	25	8	13	4

Table II asked the question: "Would you be willing to teach the Industrial Arts Curriculum Project approach to teaching industrial arts?" The same teachers answered and their responses to the question were:

TABLE II

Teacher willingness to teach the project.

Teachers	Number	For	Undecided	Opposed
Junior High School	31	14	11	6
Senior High School	25	9	9	7

The sample was divided and those who had taught the project before were asked if they would teach the project again. They responded with:

TABLE III

Willingness to teach the project again.

Teachers	Number	For	Undecided	No
Junior High School	4	4	0	0
Senior High School	4	1	0	1

Next the sample was divided as to those who had taken college courses concerning the Industrial Arts Curriculum Project and their willingness to teach the project. Twenty-one junior and fourteen high school industrial arts teachers responded to the question about willingness to teach the project with:

TABLE IV

Willingness to teach the project
after taking college preparation.

Teachers	Number	Yes	Undecided	No
Junior High School	21	13	5	3
Senior High School	14	6	5	3

The sample was then subdivided according to the number of years experience teaching industrial arts and this data was compared to feelings toward the project. The teachers responded with:

TABLE V

Teachers	Years taught	Number	Good	Undecided	Fair
Junior High School	1- 5	9	4	4	1
	6-10	9	4	3	2
	11-15	3	2	1	0
	16-20	7	2	2	3
	21-up	3	0	3	0
Senior High School	1- 5	8	3	5	0
	6-10	6	1	4	1
	11-15	6	3	3	0
	16-20	1	0	0	1
	21-up	4	2	1	1

Table VI also divided the sample according to the number of years teaching. Teachers showed their willingness to teach the program according to the number of years teaching in this way:

TABLE VI

Teachers	Years taught	Number	Yes	Undecided	No
Junior High School	1- 5	9	7	2	0
	6-10	9	4	4	1
	11-15	3	1	1	1
	16-20	7	2	1	4
	21-up	3	0	3	0

TABLE VI
(continued)

Teachers	Years taught	Number	Yes	Undecided	No
Senior High School	1- 5	8	4	3	1
	6-10	6	1	3	2
	11-15	6	3	1	2
	16-20	1	0	0	1
	21-up	4	1	2	1

SUMMARY

In this chapter, the data were collected and analyzed. The results were graphed and tabled. The graphs are shown in Appendix B. The tables are designed to show numerically the breakdown according to the number of teachers in each category. The graphs were made to show the percentages gained from the tables.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

The problem that was studied by this researcher was the attitudes of industrial arts teachers in the City of Norfolk, Virginia, toward the Industrial Arts Curriculum Project. The Industrial Arts Curriculum Project has been proven successful in most instances where it has been properly funded and implemented. It is believed that the success of any program depends largely on the teacher attitudes toward the project.

CONCLUSIONS

Using the sample and research procedures discussed in Chapter Three of this paper, the following results were obtained. In junior high school, those teachers of industrial arts with five years or less experience feel that the project is good or are undecided about the program. Those teachers with six to ten years experience also seem to like the program with a small percentage who do not like it. Those industrial arts teachers with eleven to fifteen years experience also like the program while those with sixteen to twenty years teaching experience are more against the program. Those teachers with more than twenty years experience were undecided about the project.

In senior high school, those teachers with one to five years experience in industrial arts seem to lean toward being in favor of the project with a large percentage undecided. Those teachers with six to ten years of teaching experience showed no trend either way, and those teachers with eleven to fifteen years experience showed a leaning toward the project with a large percentage that was undecided. There was insufficient data in the sixteen to twenty years teaching experience group. Those with twenty-one or more years experience came out two to one liking the project.

The results of the data obtained show that for the junior high school level those teachers with less than ten years experience are more willing to teaching the project while those with eleven to twenty years experience are more in favor of not teaching the project. Those with more than twenty years are undecided as to whether they want to teach the project.

The high school data shows that those with less than five years are in favor of teaching the project while those with less than ten years experience do not want to teach the program. Those with less than fifteen years teaching experience were more in favor of teaching the project but the margin is insignificant. Those with less than twenty years gave insignificant data and those with more than twenty years teaching experience were undecided as to whether or not they would be willing to teach the project.

On an overall basis, the data shows that the teachers with less experience as teachers in industrial arts are more willing to try something new and innovative. Those who have a program set up are

less willing to want to go to something else that has not been fully proved in their school system.

RECOMMENDATIONS

This study indicates that the City of Norfolk, Virginia, has enough teachers of industrial arts that are willing to teaching the Industrial Arts Curriculum Project to make it worth while to instigate the project. If properly funded and put in at the right level, there seems to be significant evidence that the program would prove to be of significant value, especially in this time of competency based curriculum. It is suggested that more data be obtained as to the funding, the lab size and equipment and also data is needed as to the success that has met the project in a school system comparable to Norfolk in size and racial balance.

FOOTNOTES

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2. Goin, David M. "Innovations in Industrial Arts." American Vocational Journal; March, 1970, p. 66.
3. Lux, Donald G. and Ray, Willis E.: "The Industrial Arts Curriculum Project." American Vocational Journal; March, 1969, p. 61.
4. Ibid.
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7. Ibid p. 62.
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10. Lux, Donald G. and Ray, Willis E.: The World of Construction. McKnight & McKnight Pub. Co. 1970, p. 17.
11. Ibid p. 20.
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19. Ibid.

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21. Ibid.

22. Ibid.

23. Ibid.

24. Ibid p. 21.

25. Ibid p. 27.

26 Ibid p. 23.

27. lbid p. 29.

28. Ibid p. 32.

29. Ibid p. 258.

30. Ibid p. 256.

31. Ibid p. 209.

32. Lux, Donald G. and Ray, Willis E.: "The Industrial Arts Curriculum Project." American Vocational Journal; March, 1969, p. 62.

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APPENDICES

APPENDIX A

Name _____ School _____

Number of years teaching industrial arts? _____

Do you know what the Industrial Arts Curriculum Project is?

_____ Yes _____ No

How do you feel about the Industrial Arts Curriculum Project approach? Good _____ Undecided _____ Poor _____

Have you ever taught the Industrial Arts Curriculum Project?

_____ Yes _____ No

Have you taken college classes on the Industrial Arts Curriculum Project? _____ Yes _____ No

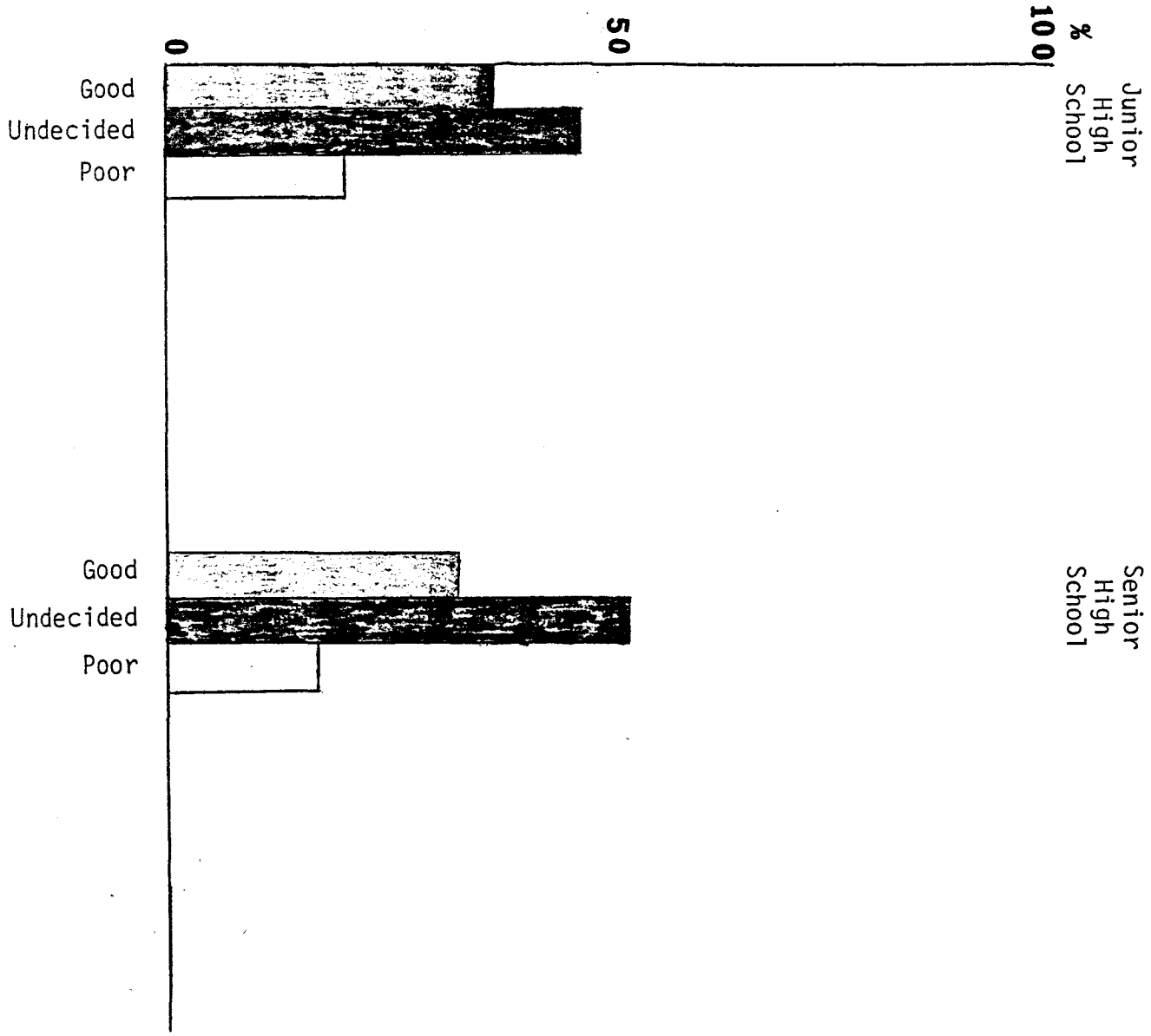
Have you ever taught in school where Industrial Arts Curriculum Project was taught? _____ Yes _____ No

Would you be willing to teach the Industrial Arts Curriculum Project approach to Industrial Arts? Yes ____ Undecided ____ No ____

APPENDIX B

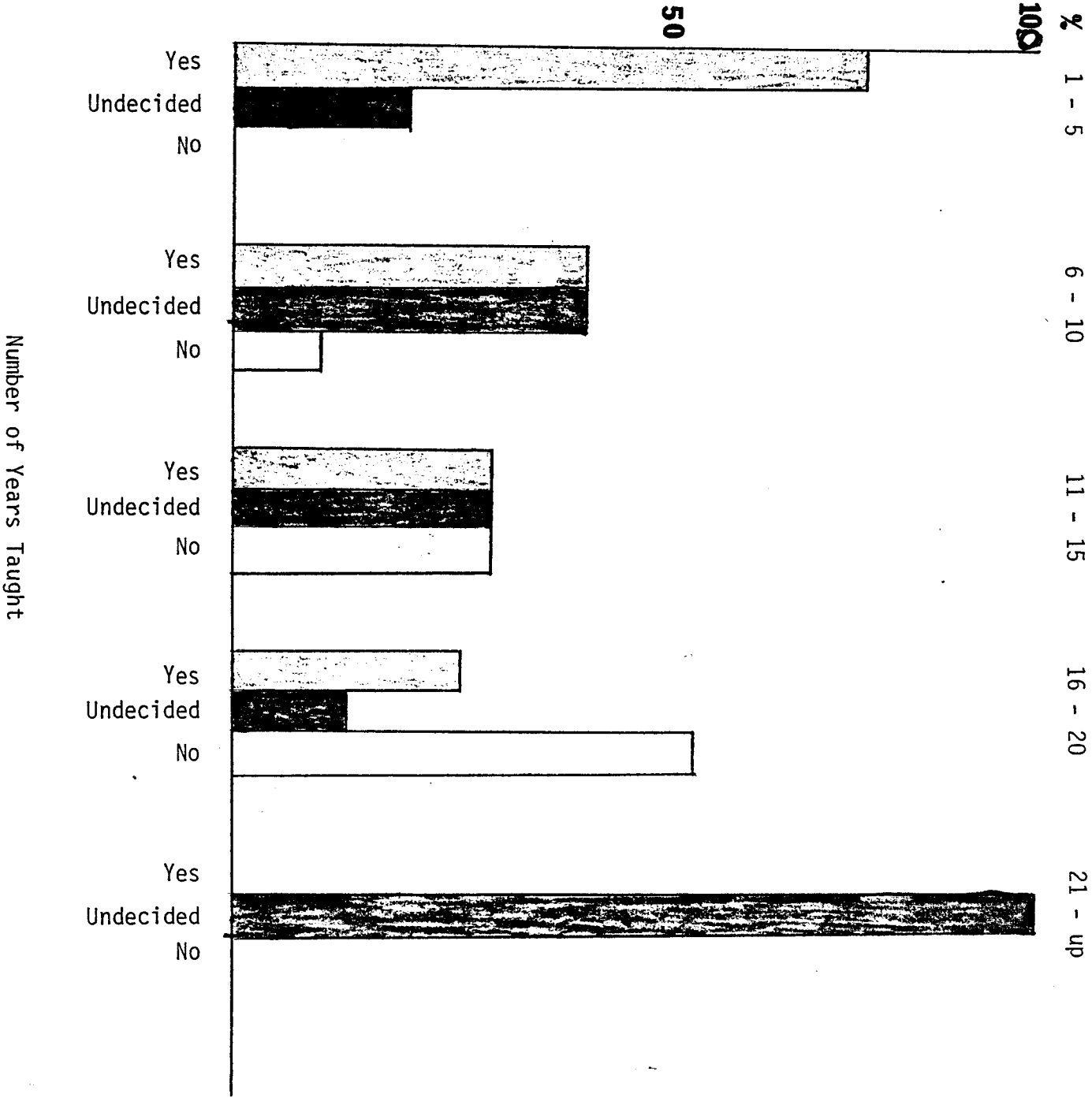
ANALYSIS OF SURVEY RESULT

ATTITUDE TOWARD PROJECT



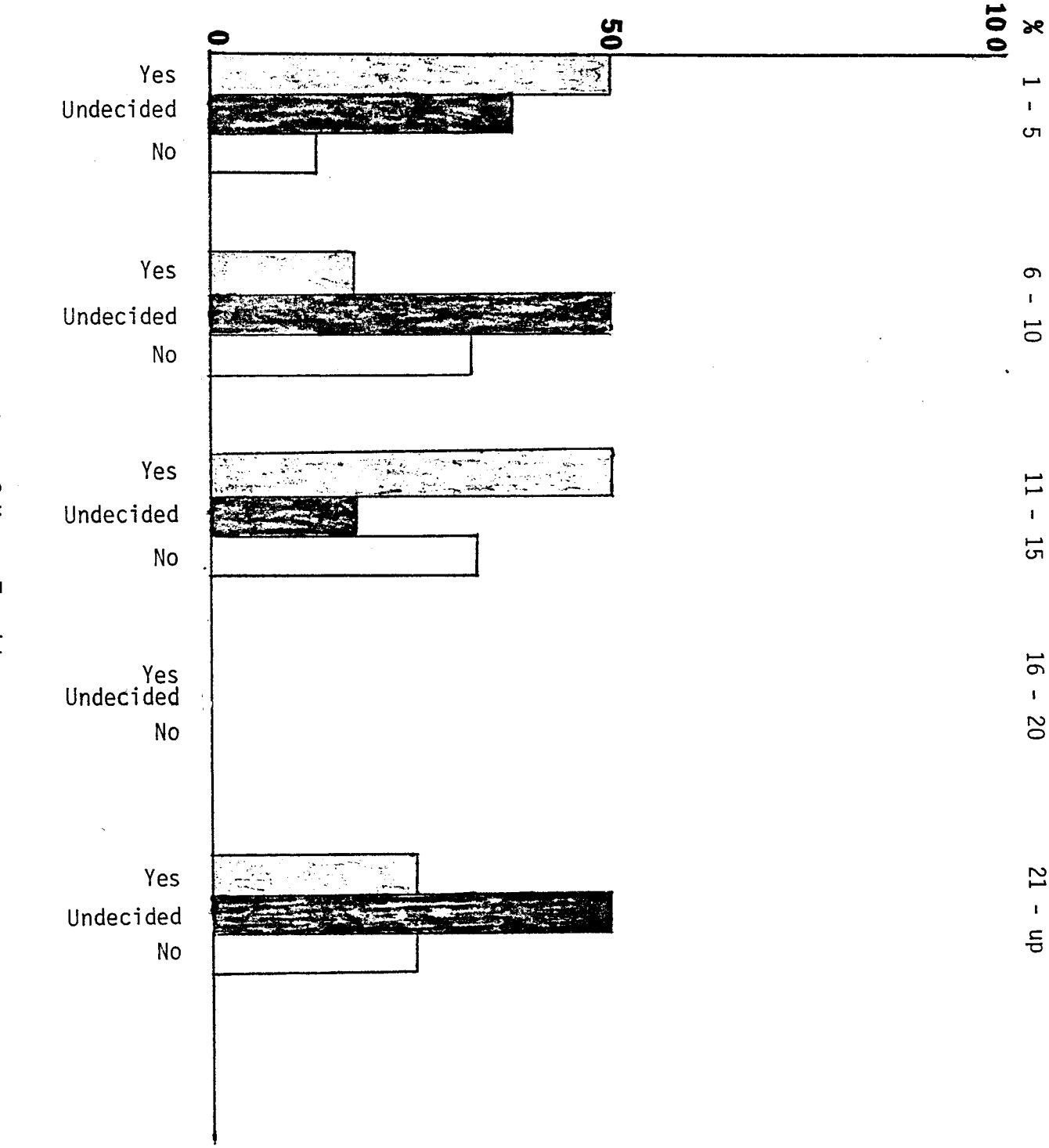
JUNIOR HIGH SCHOOL

Percent Attitude Toward Teaching IACP

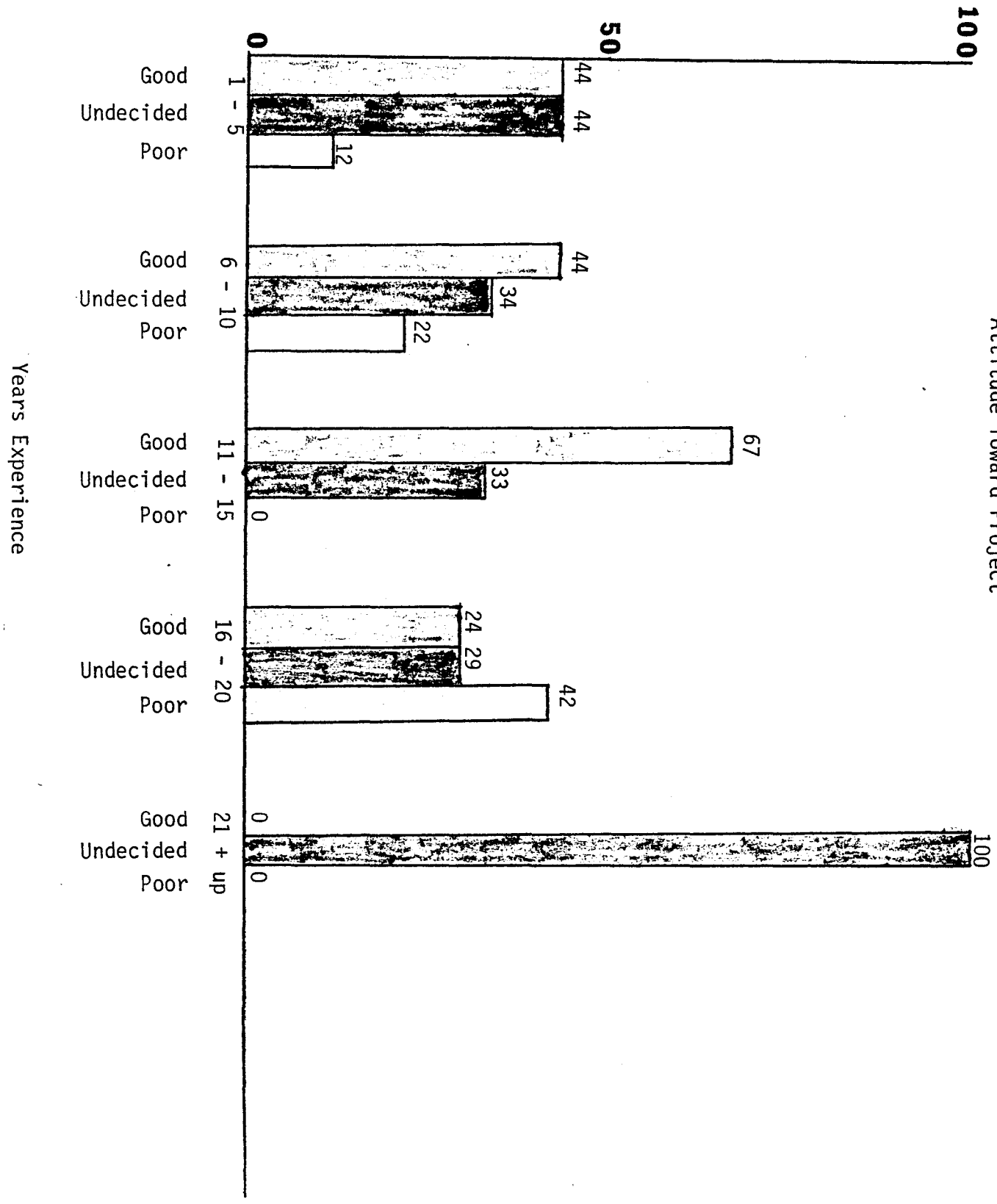


SENIOR HIGH

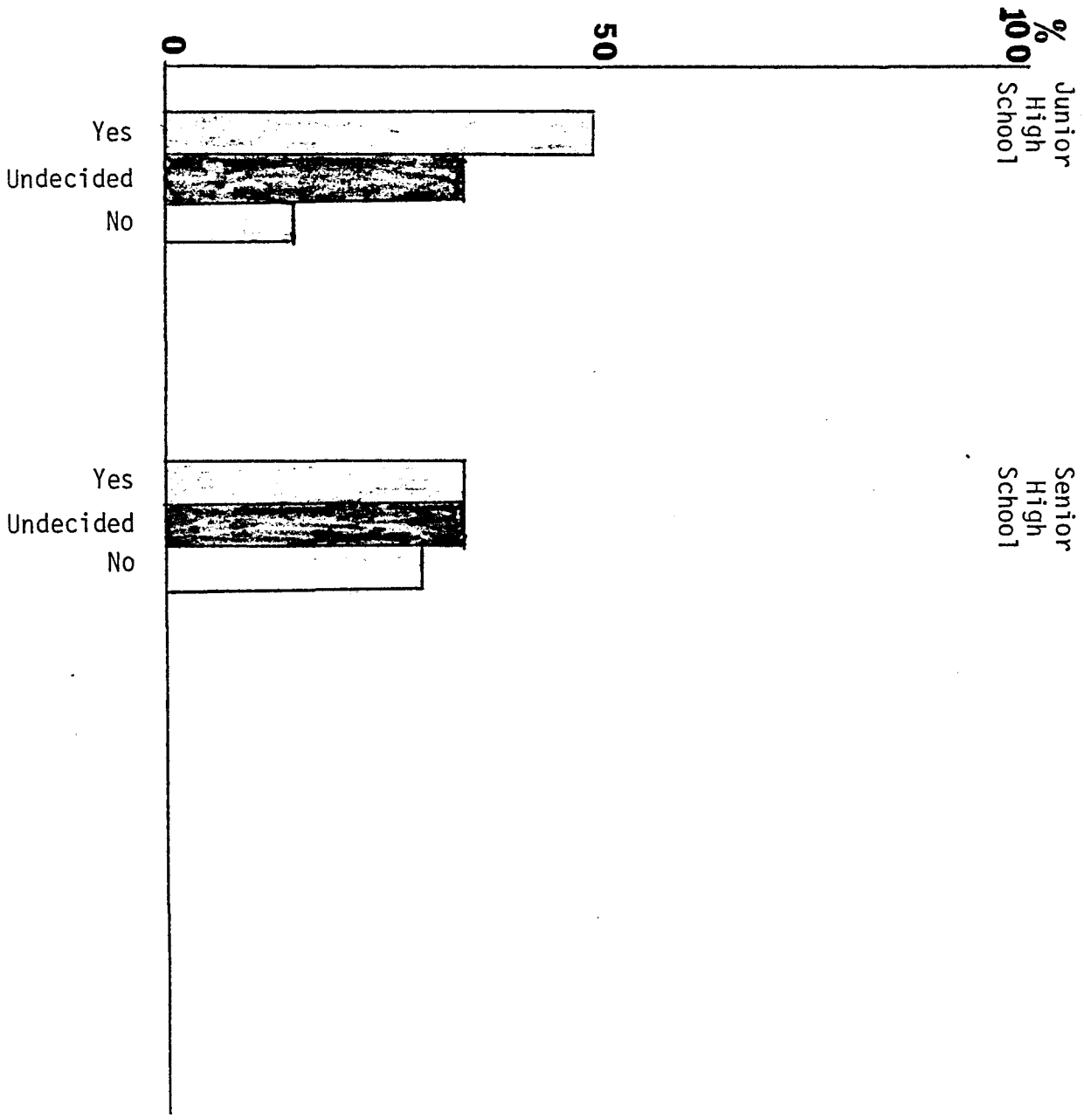
Percent Attitude toward teaching IACP



JUNIOR HIGH SCHOOL



Percent Willingness to Teach Project



SENIOR HIGH SCHOOL

Percent of Teachers