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A status study and critical analysis of present and future program goals for industrial arts in the state of Nebraska

Kennard G. Larson
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A STATUS STUDY AND CRITICAL ANALYSIS OF PRESENT AND FUTURE PROGRAM GOALS FOR INDUSTRIAL ARTS IN THE STATE OF NEBRASKA

A Dissertation

Submitted

In Partial Fulfillment

of the Requirements for the Degree of

Doctor of Industrial Technology

Approved:

Dr. Michael R. White, Advisor

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UNIVERSITY OF NORTHERN IOWA

May 1987

A STATUS STUDY AND CRITICAL ANALYSIS OF PRESENT AND FUTURE PROGRAM GOALS FOR INDUSTRIAL ARTS IN THE STATE OF NEBRASKA

An Abstract of a Dissertation

Submitted

In Partial Fulfillment

of the Requirements for the Degree

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Approved:

Faculty Advisor

Dean of the Graduate College

Kennard Gene Larson

University of Northern Iowa

May 1987

ABSTRACT

This study was conducted to describe the present status and the desired future of the industrial arts programs in the public schools in the State of Nebraska. Information concerning program goals was obtained from a descriptive survey sample of industrial arts teachers, secondary school principals, school board presidents, and industrial arts teacher educators. Two dimensions were examined: the importance of 23 program goal statements as perceived in the present industrial arts program, and the importance of the same goal statements as perceived for the industrial arts program in the future.

The outcome of the study was a compilation of data that would assist further study in the development of a strategy to move from current to future program operation. A variety of analyses were conducted to determine if differences existed concerning the importance of program goals due to: (a) position (teacher, teacher educator, principal, school board president), (b) level (junior high, senior high), (c) school size relative to enrollment (small, large), (d) teachers' personal characteristics (membership in professional organizations, teaching experience, educational attainment, age, source of bachelors and masters degree, teaching load, teacher certification status), and (e) perspective (present, future).

Twelve research questions were developed to guide the study. Analysis of variance on program goal ratings suggested that teachers, teacher educators, principals, and school board presidents rated program goals significantly different. Teachers and principals in the junior high schools were in general agreement on goal ratings, while their

colleagues in the senior high schools were not. Similarly, teachers and principals of small schools agreed less often on program goal ratings than did those of large schools. In general, teachers' personal characteristics made significant differences on program goal ratings. When tested for difference in perspective, teachers, principals, and school board presidents tended to rate program goals significantly different for future programs than they did for present programs. Teacher educators perceived fewer differences in program goals in the future when compared to the present, but did however, tend to rate contemporary program goals of more importance than traditional program goals. The present status of the industrial arts programs appeared to be traditional in nature. Significant differences existed among those representing the educational community concerning the desired future of industrial arts programs. These differences were generally concerned with high ratings of current goals by industrial arts teachers and the desire by principals, school board presidents, and teacher educators to move toward more contemporary goals for industrial arts.

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CHAPTER I

THE PROBLEM AND ITS SETTING

BACKGROUND OF THE PROBLEM

A variety of individuals and groups are interested in curriculum content and the purpose of public schools. School administrators, in the professional performance of their duties, have made such evaluations (Hager & Scarr, 1983) and others, too, are increasingly becoming concerned with the function and purpose of the public school program. Parents, the general public, and by way of the special commission on excellence in education, the government, are questioning the appropriateness of educational curriculum priorities (The National Commission on Excellence in Education [NCEE], 1983). Their report, A Nation at Risk, in essence, suggests that the public schools are not adequately preparing the nation's youth to function at their maximum potential in the society in which they live. As a result of the 1983 report, many schools revised the curriculum in an attempt to alleviate this perceived shortcoming (Levine, 1984). In many instances this was accomplished by increasing requirements in the content areas of math and science since these areas have typically been considered by most authorities as the "requisites" for conceptualizing technology (A. Jones, 1986a; Nelson, 1986).

As a result of the effort to accommodate the additional requirements within the already full school day, some areas would necessarily need to be curtailed or omitted from the curriculum. One area consistently targeted for possible elimination is the industrial

arts program. A variety of reasons may be observed for its vulnerability to elimination. (a) The program typically is an expensive curriculum to support. Therefore, in light of current budget reductions, its elimination becomes even more justifiable in the minds of superintendents, principals, and school boards. (b) Many of the industrial arts courses (especially in the high school curriculum) are of an elective nature. Consequently, not all students would be impacted by the elimination of these courses. But, perhaps of most significance to this study, is that (c) the typical industrial arts program is perceived by an increasing number of administrators as "antiquated" and providing no real value in preparing students to adequately function in a technological society (Annison, 1983; Hughes, 1984).

SIGNIFICANCE OF THE PROBLEM

It appeared that the continued existence of the industrial arts curriculum in most schools may have been questioned especially by administrators as they perceived the educational value of the program. Ryan (1985) claims that if industrial arts is to remain a viable program, change to a more future-oriented program is necessary. Industrial arts programs that are indeed "state-of-the-art," and as such, are adequately preparing students, need to relate their educational value to administrators and the public. On the other hand, programs that do not meet the needs of students in a technological society need to be revised, or risk elimination from the curriculum. This elimination would have significant impact, since industrial arts traditionally has been a viable method of general education for many average and below average students and to eliminate this alternative may

have a significant negative impact on the education of youth (White, 1984).

In the State of Nebraska, there is no system in place for the collection of data related to industrial arts program goals nor a strategy to incorporate the data into improving or upgrading the curriculum (L. Mather, personal communication, August 23, 1986). The development of such a strategy required that a status study regarding the present and future potential of industrial arts be conducted to identify and describe the existing situation of the profession. It was intended that the results might provide the State of Nebraska with the opportunity to compare itself with past, present, and future goals at the national level. The results of this study then, were intended to provide information that could:

1. enable the state department to be better informed about present and future directions of the profession;

2. assist present and future industrial arts teachers in developing and upgrading their programs;

3. assist Nebraska teacher educators and teacher education institutions in curriculum development;

4. provide the potential for the State of Nebraska to upgrade industrial arts for the needs of society; and

5. provide a data base for future studies concerning industrial arts in the State of Nebraska.

By definition, industrial arts involves experiences and activities using tools, machines, materials, and processes (The Nebraska State Department of Education [NSDE], 1975). Therefore, if it is acknowledged

that contemporary society is indeed technological in nature; that is, increasingly dependent on tools, materials, machines and processes, it would appear that the industrial technology curriculum would/could provide an avenue for conceptualizing technology. Recent curriculum efforts such as Jackson's Mill Curriculum Theory (Snyder & Hales, 1981) and the resulting curriculum structure, Industry and Technology Education (Technical Foundation of America [TFA], 1984), and Principles of Technology (Center for Occupational Research and Development [CORD], 1984) have sought to more closely align industrial arts goals with contemporary technological understanding.

Three determinants can be identified that affect the degree of implementation of a curriculum (Zais, 1976); (a) professionals (e.g. classroom teachers, school administrators, and teacher educators), (b) parents and students, and (c) local leadership (e.g. school boards). Each has an important role in successfully implementing curriculum. (a) Classroom teachers tend to teach as they have been taught and are not inclined to consider change. However, Findley and Hamm (1977) found that classroom teachers ". . . either make or break any program" (p. 59) and may be the most crucial element in determining if curricula are implemented (Sanders & Chism, 1985). (b) Teacher educators are expected to provide the potential and practicing teachers with contemporary content and research results (Guyton, 1984). Therefore they may also have significant influence on the ability of a teacher to recognize the need for change. (c) The local school building principal evaluates curriculum and teachers and ultimately decides what is appropriate curriculum for all students and how it should be taught (Hager & Scarr,

1983; Markert, 1984; Virgilio, 1984). The concept of curriculum development also supports the need for the incorporation of local wants and needs into the curriculum (Zais, 1976). Therefore, the perceptions of the local school board must also be considered.

STATEMENT OF THE PROBLEM

The research problem associated with this study was to determine the present status and the desired future of industrial arts goals in the public schools in the State of Nebraska, as perceived by industrial arts teachers, school principals, school board presidents, and industrial arts teacher educators. Two dimensions were examined: the importance of 23 program goal statements as perceived in the present industrial arts program, and the importance of the same goal statements as perceived for the industrial arts program in the future.

The results of this study will enable the compilation of a data base to assist further study in the development of a strategy to move from current to future program operation. A crosstabulation analysis was employed in this investigation. The following research questions were developed to guide this study:

1. Were there differences among industrial arts teachers, industrial arts teacher educators, school principals, and school board presidents on perceived present and future program goals of industrial arts as measured by the oneway analysis of variance?

2. Were there differences among school principals, school board presidents, and industrial arts teachers of small schools compared with large schools regarding their perception of present and future program goals of industrial arts as measured by a oneway analysis of variance?

3. Were there differences between school principals and industrial arts teachers of junior high schools compared with senior high schools regarding their perception of present and future program goals of industrial arts as measured by a oneway analysis of variance?

4. Were there differences due to industrial arts teachers' membership in professional organizations (state and national) relative to the importance of present and future program goals as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

5. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to source of bachelors degree as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

6. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to source of masters degree as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

7. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to class load as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

8. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to level of education as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

9. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to number of years of industrial arts teaching experience as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

10. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to their age as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

11. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to status of teacher certification as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

12. Were there differences between respondents' perceptions of program goals due to perspective (present/future) as measured by a matched pairs t-test (correlated t)?

PURPOSE OF THE STUDY

The purpose of this study was to describe the present status and the desired future of industrial arts goals. Five underlying purposes were to determine if differences existed concerning the importance of program goals due to: (a) position (teacher, teacher educator, principal, school board president), (b) level (junior high, senior high), (c) school size (small, large), (d) teachers' personal characteristics (membership in professional organizations, teaching experience, educational attainment, age, source of bachelors and masters degree, teaching load, and status of teacher certification), and (e) perspective (present, future). It was anticipated that the

completion of this study might provide an avenue of understanding that would more closely identify the perceptions of teachers, teacher educators, principals, and school board presidents concerning the program goals of industrial arts.

NEED FOR THE STUDY

We live in a technological society. Students are not being adequately prepared to conceptualize nor achieve their full potential in a technological society (Annison, 1983). A public school curriculum which includes a contemporary industrial technology program may contribute to students' preparation for this type of society (Benson, 1986). Curriculum guides, theories, and standards are available to augment the ability of industrial arts to contribute to this preparation. They include: Jackson's Mill Curriculum Theory (Snyder & Hales, 1981) and the resulting curriculum structure, Industry and Technology Education (TFA, 1984), Principles of Technology (CORD, 1984), Technology Education: A Perspective on Implementation (American Industrial Arts Association [AIAA], 1985b), and Standards for Technology Education (AIAA, 1985a). These are not being utilized to maximum potential (Hughes, 1986) if at all, and as a result, may be leaving many industrial arts programs suspect of their educational worth. If programs are determined to be dispensable, an avenue for general education may be denied many students (White, 1984). This study is needed to insure that the perceived educational needs of students are being met to the fullest potential.

ASSUMPTIONS

The following assumptions were made in conducting this study:

1. The Nebraska State Department of Education, Management Information Services, maintained an accurate and current listing of junior and senior high industrial arts teachers, school board presidents, and principals in the State of Nebraska.

2. Data for the study could be obtained from teachers, principals, school board presidents, and teacher educators by means of a validated descriptive survey.

3. All respondents (with the exception of industrial arts teacher educators) surveyed would actually be teaching in or administrating industrial arts programs in the public secondary school in Nebraska.

4. Those responding to the instruments would be able to discriminate the relative importance of program goals.

5. That the Council on Technology Teacher Education/National Association of Industrial and Technical Teacher Educators (CTTE/NAITTE) maintained an accurate and current listing of industrial arts teacher educators.

DELIMITATIONS OF THE STUDY

It is realistically acknowledged that delimitations concerning a study must exist. Therefore, the following delimitations were identified for this study.

1. The study was conducted within the geographic boundaries of the State of Nebraska and the results limited to that state.

2. The population for the study was limited to public, full-time junior high and senior high industrial arts teachers, junior high and

senior high building principals, school board presidents, and full-time industrial arts teacher educators of Nebraska's four-year state colleges and the university as listed by the The Nebraska State Department of Education, Management Information Services, and the CTTE-NAITTE Industrial Teacher Education Directory (Dennis, 1986), respectively.

3. Program goals were limited to those identified by the Frey (1985) study which identified a crosstabulation matrix of the 1966 Schmitt-Pelley study, the standards project of 1980, the Atkins study, and those articulated in the Jackson's Mill Industrial Arts Curriculum Theory. Details of this crosstabulation are found in the review of literature.

4. Due to restrictions on time and finances, student and parent/guardian populations were not included.

DEFINITION OF TERMS

General Education. "Those phases of learning which should be the common experience of all men and women" (Good, 1973, p. 258).

Industrial Arts.

> That field which provides opportunities for all students from elementary through higher education to develop an understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical, and cultural aspects of industry and technology. Furthermore, it is a field wherein students acquire industrial-technical knowledge and competencies through creative and problem-solving learning experiences involving such activities as experimenting, planning, designing, constructing, evaluating, and using tools, machines, materials, and processes. (NSDE, 1975, p. 10)

Industrial Arts Teacher Educator. "A member of a senior college or university who is primarily concerned with professional preparation of industrial arts teachers" (Frey, 1985, p. 10).

Industrial Education. "A term used to designate various types of education concerned with modern industry, training, technical education and apprenticeship training, and vocational-industrial education in both public and private schools" (Good, 1973, p. 299).

Junior High School. "Usually, a school that enrolls pupils in grade 7, 8, and 9" (Good, 1973, p. 322). For purposes of this study, junior high schools and middle schools will be considered as the same population.

Large School. For purposes of this study, large schools will be those schools classified "Class A" as defined by the Nebraska School Activities Association, Directory of Schools for 1986-87. This approximates those with high school enrollments of 500 and above.

Middle School. "A school administrative unit typically between the primary elementary unit and the last or secondary unit in the school system" (Good, 1973, p. 366). For purposes of this study, junior high and middle schools will be considered as the same population.

Program Goals. "Definitive general statements of purpose concerning the knowledge, skills, and values students are expected to learn as a result of instruction associated with an industrial arts program" (Frey, 1985, p. 10). For utilization in this study, the 23 program goals (see Appendix B) were further defined by classifying them as contemporary or traditional. The following listing classifies them accordingly:

Contemporary

Goal 2. Solution to societal problems.
Goal 3. Application of science and math.
Goal 6. Work, leisure, and citizenship.
Goal 8. Changes in materials, industrial processes, and products.
Goal 10. Evolution and relationships of society, technical means.

Goal 13. Integration of educational studies.
Goal 15. Nature and characteristics of technology.
Goal 17. Beliefs and values based on the impact of technology.
Goal 22. Understanding of technical culture.

Traditional

Goal 1. Handyman activities.
Goal 4. Habits of health and safety.
Goal 5. Develop technical talents.
Goal 7. Discover interests and aptitudes.
Goal 9. Good workmanship and design.
Goal 11. Educational and occupational choices.
Goal 12. Leisure time interests.
Goal 14. Vocational training.
Goal 16. Technical skill and knowledge.
Goal 18. Tools, techniques, and resources of industry/technology.
Goal 19. Problem-solving skills.
Goal 20. Consumer knowledge.
Goal 21. Insight into industry.
Goal 23. Prevocational experiences.

Senior High School. "The upper part of a divided reorganized secondary school, comprising usually grades 10 to 12 or 9 to 12" (Good, 1973, p. 527).

Small School. For purposes of this study, small schools will be defined as schools classified "Class B, C, or D" as defined by the Nebraska School Activities Association, Directory of Schools for 1986-87. This approximates those with high school enrollments of less than 500.

Technology Education. "A comprehensive action-based educational program concerned with technical means, their evolution, utilization, and significance; with industry, its organization, personnel, systems, techniques, resources, and products; and their social/cultural impact" (American Industrial Arts Association, 1985a, p. 7).

Traditional Industrial Arts Teacher. One who teaches courses in industrial arts that are most often referred to as woodworking, metalworking, and drafting.

CHAPTER II

REVIEW OF RELATED LITERATURE

THE PRESENT STATUS OF INDUSTRIAL ARTS

With the publication of the report from the special commission on excellence in education, A Nation at Risk, many local secondary school administrators (in some cases, by state mandate) began to propose increased requirements for graduation (Levine, 1984). The State of Nebraska is one of the states, mandated by legislative bill 994, to increase such requirements (Legislature of Nebraska, 1984). For example, in 1984 a study by Nelson (1986) reported that of 31 states surveyed, the number of courses required for graduation had increased by 55%, 94%, and 84% respectively for English, math and science. The increase in requirements was deemed necessary to combat the continuing decline in students' academic ability as perceived by The Special Commission on Excellence in Education and others. Parents, as taxpayers, may be increasingly concerned about the value return on tax dollars spent and have questioned the appropriateness of various curriculum offerings. Most serious of the perceived shortcomings of the present curriculum lies in the area of math, science, and communication (Nelson, 1986).

Therefore, most administrators have opted to increase the requirements in these same three areas (Nelson, 1986). Others too have cited the values in a fundamental education. For example, Burns (1986) offers: "America's strength depends on our graduates work skills, productivity, and attitudes" (p. 8). However, some writers argue that

if students are not competent in these areas within the existing requirements, to require more of the same will accomplish nothing (Benson, 1986; Glines, 1986). Benson (1986) proposes that students study "technology" as a phenomenon all of its own rather than place more emphasis on science, math, and computers. Hughes (1986) agrees that all students need a firm grounding in basics but also proposes that the study of technology does not "fit" in a science class. Science is too theory oriented and thus cannot deliver the application base that students need. Meeks (1986) fosters the addition of a "fourth R," Relevance. Meeks notes that adding relevance is more appropriate than additional requirements in math and English and that technology education is the vehicle to accomplish this relevance. These approaches will be elaborated upon in the next section of this chapter, future goals of industrial arts.

In most instances the increased academic requirements have made necessary the reduction or elimination of several elective courses. As a result, industrial arts classes, in many cases, have been targeted for elimination. Nelson (1986) reports that in his survey to 31 states, the number of industrial education type courses (including vocational education) had declined by a total of 29%. Taylor (1984) states "it is no secret as to the extent this new dimensional perspective on the back to the basics movement will add to the already enormous burden industrial education programs are feeling" (p. 27). Other "burdens" that industrial education programs are experiencing would include budget reductions, teacher shortages, and due to demographic changes, declining student populations from which to draw (Edmunds, 1986). Of special

significance to this study however, is the somewhat negative perception of many school administrators to the value of industrial arts (Pelletier, 1986).

Not only are many industrial arts classes being eliminated, but in some cases, the total industrial arts program or at least one or more of the industrial arts instructors have been eliminated. To illustrate, a recent interview with Mather (L. Mather personal communication, August 23, 1986) revealed that approximately 30 industrial arts teaching positions have been eliminated in the State of Nebraska in the past year. As a result, in addition to the loss of an elective option for the total school population, the denial of an avenue of general education for average and below average students may have a significant long term negative impact on these students and society as a whole (White, 1984). In reference to excellence in education, Maley (1986) states that our educational system is:

> . . . not a system predicated on the concept of education for the few, the privileged, the elite, or just the college bound. The demands of a democracy reach out for support and substance to each and every citizen. There can be no lesser requirement if democracy is to survive. (pp. 45-46)

Proposed solutions to the problems of industrial arts are varied and many. The literature in industrial arts provides insight to some of the proposed solutions.

THE FUTURE OF INDUSTRIAL ARTS

The industrial arts profession has been impacted greatly by the groundswell of change that has swept society and education in recent years. This concept of change has been met with resistance by some, indifference by others, and welcome by few. In an attempt to respond to

the stimulus of change, a variety of actions/reactions have been observed in the literature of the industrial arts profession (Maley, 1986; Benson, 1986; Glines, 1986; Lux, 1983). These changes vary from name change alone (Lux, 1983) to a total change in philosophy and rationale for existence of industrial arts in the school program (Annison, 1983).

Secretary of Education, William Bennett, in his message to the American Vocational Association in 1985 (A. Jones, 1986b), stated that students will hold several jobs in their lifetime and thus flexibility and a general education are important. His implications for the industrial arts profession were that what is needed is a balance between academic and vocational studies. Teachers are training students for a relatively unknown and changing workplace, and as a result, learning how to learn becomes an invaluable necessity (Harding, 1986).

As a result of a survey to the profession in 1985, Miller (1986) states: "We are beginning to see industrial arts is no longer a preferred title for what we do" (p. 8). Of 1,530 professional members of the American Industrial Arts Association who were eligible to vote, 1,015 voted for a name change to the International Technology Education Association, however, only 4 states officially use the title "technology education" (Miller, 1986). The potential membership of this professional organization is estimated to be in the range of 47,572 to 65,000 (Edmunds, 1986). Many have commented on the inappropriateness of a name change without a significant change in content (Lux, 1983).

It must be noted that the notion of philosophical change for the industrial arts profession was not initiated only after the release of

studies in the eighties on education demise. In the late 1970s, professionals in the industrial arts/technology education field had initiated the development of proposed standards for a curriculum that focused more on academic skills that would allow students to progress with the changing technology of the future, but yet preserve the "hands-on" tradition of industrial arts (A. Jones, 1986c). This new curriculum, known as "technology education," fosters, among others, the concepts of increased skill in the areas of problem solving, decision-making, communication, and learning how to learn (American Industrial Arts Association, 1985b). As a result, for many industrial arts teachers in the profession, technology education becomes an answer to the question of adequate preparation of individuals for the future.

The technology education curriculum is not the only proposed "future-oriented" curriculum to which industrial arts may aspire. The "Principles of Technology," a course which emphasizes the application of math and science principles through hands-on problem solving situations, appears to some as an appropriate direction in which industrial arts could move (Jordon, 1986). The potential for interdisciplinary teaching, especially between science and vocational education, is enhanced. It must be acknowledged, however, that this approach is in only its second year of field testing and that much information is currently being collected. While these trends are identifiable, especially in the literature, there are some industrial arts teachers that are content to continue teaching traditional industrial arts because they recognize the basic skills that these activities foster. These skills include organization, craftsmanship, perseverance, safety

awareness, motivation, and, even though somewhat limited, math, science, and reading skills.

It becomes evident that not all schools will experience a uniform transition to a new curriculum. Furthermore, some may elect not to change at all. However, Hughes (1986) infers that now may be the last opportunity for industrial arts to gain viability in the curriculum. He states:

> The timing is ideal to rebuild and strengthen our role in the nation's schools. The industrial arts profession has more than an opportunity to respond. It has an obligation to its students--and a promise to our nation's future--to promote the dynamic application-based program for which it is noted. (p. 28)

This, perhaps, identifies the underlying impetus for this study. In many cases, parents, students, and administrators have not witnessed the results of an industrial arts program grounded in a general education philosophy, but rather a program that represents vocational training or exploration of leisure time activities. It is anticipated that this study will describe which approach is generally in place in the State of Nebraska and what the desired future is, and as a result, provide data for the development of a strategy to move to that desired future.

THE IMPACT OF TEACHERS AND ADMINISTRATORS ON CURRICULUM CHANGE

The ultimate outcome of this study was to describe the present status and desired future of industrial arts in the State of Nebraska. In determining the population for this study, one particular citing in the literature was especially explicit to this end. Lippitt, Langseth, and Mossop (1985) reveal the following:

> We have found that the best people to solve complex organization problems are those who face them every day. We also know that it is the people in an organization who can implement or block needed changes. Involving them in problem diagnosis can result in reaching better solutions--and ones that work. (p. 53)

With this premise, it was determined that the industrial arts teachers and the building principals in the junior high and senior high schools, school board presidents representing those schools, and industrial arts teacher educators, who in general prepare the teachers for those schools, would comprise the population from which to solicit the needed data.

The most likely segment of the population to influence the benefits targeted for the student population may well be the teachers in the school. When referring to the effects of teachers on students, Findley and Hamm (1977) state that classroom teachers ". . . either make or break any program" (p. 59). Sanders and Chism (1985) suggested that classroom teachers may be the most crucial element in determining if curricula are implemented.

Hager and Scarr (1983), Markert (1984), and Virgilio (1984) all recognize the importance that administrators play in evaluating curriculum and ultimately deciding what is appropriate curriculum for all students. The rationale for administrators in this role is supported when alluding to the incorporation of community wants and needs through the local school district and administration (Zais, 1976). Therefore, building principals and school board presidents, as the administrators most closely associated with the curriculum evaluation and community wants and needs, respectively, may have significant impact

on the evaluation and implementation of any curriculum or change in direction of curriculum.

Teacher educators are expected to provide potential and practicing teachers with contemporary content and research results (Guyton, 1984) and therefore could be instrumental in guiding curriculum change toward the future goals of industrial arts. The industrial arts teacher educator may have significant influence on the preparation of industrial arts teachers and could guide those entering the profession in a direction more closely associated with the perceived desired future of industrial arts. The experience and knowledge of teacher educators in the State of Nebraska concerning the past problems with curriculum revision, and the political and economic constraints that are in place, is the justification for the inclusion of this population in the study.

REVIEW OF RESEARCH METHODOLOGIES

The goal of the scientific method, as applied to educational research, is an attempt to explain or predict phenomena. Evolvement toward this goal involves gathering knowledge and developing and testing theories (Gay, 1981) and as a result, the generation of viable theories becomes valuable in explaining phenomena. However, the development of these theories or hypotheses poses a myriad of problems for educational research. Johnson (1977) states: "While a well formulated hypothesis offers needed focus to a study, a hypothesis is not a requirement for research in education. Various degrees of specificity can be introduced by formulating one or more questions" (p. 199). Since this study had no prior research on the population upon which to base hypotheses, research questions were used to guide this study.

Research methodologies can be classified into five general categories: historical, descriptive, correlational, causal-comparative, or experimental. The nature of the problem to be studied guides the selection of the most appropriate methodology. With this premise, the descriptive survey method was selected for this study. A rationale for this method follows.

"Descriptive research involves collecting data in order to test hypotheses or answer questions concerning the current status of the subject of the study" (Gay, 1981, p. 12). Typical topics of study include assessing attitudes or opinions toward individuals, organizations, events, or procedures. Jones (1973) reports that one of the most common methods of collecting data for educational research purposes is the normative survey. The questionnaire survey has distinct advantages if a sampling of the population is used for the retrieval of data. The mailed questionnaire is obviously faster than either the interview or the observation technique. By incorporating the mailed questionnaire with a sample of the population, a considerable savings in time and money can be realized (R. Jones, 1973). In no other way could such a large segment of the population be made available to the researcher at minimum cost.

However, the method is not without limitations. What appears to be a quite simple matter of mailing out some questions and waiting for the results is in reality an oversimplification of a very complicated technique. The problems inherent in this technique are generally identified in (a) instrument development and modification, (b) sampling

techniques, (c) data analysis (R. Jones, 1973), and (d) insufficient response rate (Gay, 1981).

Instrument Development, Modification, and Response Rate

To overcome the limitations of the survey questionnaire (development, modification, return rate), a number of suggestions have been identified in the literature and incorporated in this study. One of these suggestions is that the topic of the questionnaire must be of significant importance to motivate subjects to respond. The problem must be adequately defined in terms of information needed and as a result every item on the questionnaire should directly relate to the respondent. The validity of the questionnaire can be assured by having a group of respondents complete the questionnaire and then actually observing the respondent to determine if the respondent behaves as was self-reported in the questionnaire. An approved alternate method is to have a group of experts analyze the instrument and thereby determine the content validity (R. Jones, 1973). However, even though this approach requires less time, it is open to the fallibility of the experts' judgment.

The survey form should be brief, attractive, and easy to complete. Although open ended forms are easier to construct, closed form questionnaires (those not requiring written responses) are preferred. This technique allows a more objective and efficient method of data analysis. The use of an "other" category helps prevent the problem of a choice not exactly describing a true response of a subject. "Leading" and "touchy" questions should be avoided and careful wording is

mandatory. Questionnaire items should be arranged in a logical sequence.

An attractive, informative, and personalized cover letter should accompany the survey questionnaire. This letter should explain the coding system and stress the respondents' anonymity, as well as identify a deadline date for the questionnaire to be returned. A signature from a well respected individual on this letter is desired. A stamped, addressed, return envelope should be included (Gay, 1981) to boost return rates. A variety of additional techniques have been employed to increase return rates (e.g. colored paper, personalizing the address, money inducements, and reply deadlines). However, Bailey (1982) reports that the amount of increase is insignificant and in some cases there is a reduced response rate. Babbie (1973) suggests that by using a 3-step follow-up (post card, second survey, phone call), at least a 75% return rate should be achieved.

Sampling Technique

Problems involved in sampling technique include (a) representativeness of the population, (b) sufficient numbers to perform statistical analysis, and (c) randomness of the sample selection. Representativeness can be improved by stratifying the population to include proportionate groupings based upon characteristics known or presumed to be relevant about the population (R. Jones, 1973).

Proportion by percentage is typically used for stratifying large populations. For example, if there were five times as many high school industrial arts teachers as junior high industrial arts teachers in the

total population, the sample of high school teachers should be five times as large as the sample of junior high teachers.

As an alternative, a disproportionate sample may be used. Bailey (1982) states that "if the population of a particular stratum is small we may have to sample the entire population in order to gain an acceptable sample size" (p. 105). When referring to the advantages in representativeness, Bailey also states that "disproportionate stratified sampling combined with weighting ensures adequate and equal representation of all strata" (1982, p. 107). The use of the disproportionate sample requires that if the data from these subgroups are to be combined in an effort to make generalizations for the total population, a weighting factor must be employed (Bailey, 1982; Gay, 1981; Johnson, 1977; R. Jones, 1973). This weighting factor is determined by "noting the probability of selection for a group and assigning a weight equal to the inverse of this probability selection" (Bailey, 1982, p. 105). For example, if 100 individuals were selected out of a group of 300, the probability of selection would be one third. Therefore the weighting factor, as an inverse of the probability, would be three.

Sample size can be determined employing the following guidelines identified in the literature. The question of sample size receives a great deal of emphasis in the literature. However, Fox (1969) and Johnson (1977) claim that sample size is far less important than sample representativeness. Subsample or "cell" size (the smallest group of respondents after stratification) typically should be from 20 to 40. A smaller sample size would be less expensive, but may not provide

sufficient data for statistical analysis (R. Jones, 1973). However, in some cases, 15 has been determined to be adequate. Gay (1981) suggests a minimum sample size of 30 for correlational studies. Gay (1981) also reports that there are precise statistical techniques which can be used to estimate sample size. However, such techniques require previous knowledge about the population such as differences expected between groups. Gay (1981) also states: "requiring 30 seems to be a little on the idealistic side" (p. 98) but adds that "for descriptive research, a sample of ten percent of the population is considered minimum" (p. 98).

Data Analysis

One form of data analysis requires describing or summarizing the data using descriptive statistics. Descriptive statistics allows the researcher to meaningfully describe a large quantity of data with a small number of indices. These typically include measures of central tendency (usually the mean), measures of variability (most commonly standard deviation), and measures of relationship (Pearson r when data are represented in interval or ratio scales) (Gay, 1981). It is noted that measures of relationship should not be interpreted to imply cause and effect, only that a relationship does or does not exist.

Tests of significance are used to determine if the means from two (or more) groups are different enough to conclude that they represent a true difference. The tests are conducted at predetermined probability levels (e.g. .05, .01) that allow the researcher to state that the results could have happened by chance only five times out of a hundred or one time out of a hundred, respectively. "The most commonly used level of significance is the .05 level" (Gay, 1981, p. 314).

The researcher must select the most appropriate test(s) of significance to avoid incorrect conclusions. Parametric tests are usually more "powerful," that is, less likely to commit an error in making conclusions. Parametric tests, however, require that certain assumptions be met in order for the tests to be valid. These assumptions can be summarized as follows: (a) the variables are normally distributed, (b) the data represent an interval or ratio scale, (c) subjects are selected independently, and (d) that the variances of the population groups are equal. With the exception of independence, "some violation of one or more of the assumptions usually does not make too much difference" (Gay, 1981, p. 318).

The t-test is a common parametric test. However, the analysis of variance (ANOVA) is used more often when determining if a significant difference exists between two or more means at a selected probability level. Variance within groups as well as between groups can be calculated with the resulting F ratio determining if the independent variable had a significant effect on the dependent variable (Gay, 1981).

A nonparametric test should be used when the assumptions required for a parametric test cannot be met. These tests are usually employed when the data are of a nominal or ordinal scale or when the nature of the distribution cannot be assumed to be normal. It must be acknowledged that these tests, however, are not as powerful as parametric tests. The Chi square test is commonly used in educational research to determine if two measures are related.

Fortunately, the arduous task of data analysis has been reduced by the advent of the computer. A variety of computer programs are

available for calculation of the various statistical tests. Probably the most popular program is the Statistical Package for the Social Sciences (SPSS) (Gay, 1981).

CHAPTER III

METHODS AND PROCEDURES

POPULATION AND SAMPLE

The purpose of this study was to describe the present status and the desired future of industrial arts goals in the public junior high and public senior high schools in the state of Nebraska. A review of the literature indicated a need for this study. The review of literature also exposed what appeared to be an appropriate population from which the data could be retrieved and an appropriate methodology for the research.

The four populations for this study were (a) the junior high and senior high principals in the state of Nebraska, (b) the junior high and senior high industrial arts teachers in the state of Nebraska, (c) the teacher educators in the industrial arts departments of the four state colleges in Nebraska and at the University of Nebraska, and (d) the school board presidents in the state of Nebraska. Since the study was conceptualized to eventually influence the future of the industrial arts curriculum in Nebraska, the study was confined to that state. This was deemed necessary because of the unique economic, political, and historical factors associated with this state. The literature supports this approach of confining a study to "within" the organization under these special conditions (Martino, 1983).

DATA COLLECTION PROCEDURES

The data collection was accomplished by descriptive surveys to disproportionate, stratified, random samples of junior high and senior high principals, junior high and senior high industrial arts teachers, and school board presidents. Due to insufficient numbers for sampling, the total population of industrial arts teacher educators was surveyed. A descriptive survey instrument was utilized. A survey of present and future industrial arts program goals was administered to junior high and senior high principals, junior high and senior high industrial arts teachers, industrial arts teacher educators, and school board presidents.

The questionnaire (see Appendixes B and C) consisted of 23 program goal statements pertaining to the content of the industrial arts curriculum. These program goal statements were adopted from a similar study done in Kansas, Missouri, and Oklahoma (Frey, 1985). The program goal statements by Frey (1985) were adopted from a cross-tabulation of four sources: (a) Industrial Arts Education: A Survey of Programs, Teachers, Students and Curriculum (Schmitt & Pelley, 1966), (b) Dugger's 1980 Standards Project for industrial arts, (c) the 1974 Atkins study of 550 program goals for industrial arts identified in the literature, and (d) the Jackson's Mill Curriculum Theory (Snyder & Hales) of 1981. The junior high and senior high principals, junior high and senior high industrial arts teachers, school board presidents, and industrial arts teacher educators were asked to rate, on a Likert scale, their opinion on the appropriateness of the program goal statements. Each respondent was asked to make two judgments; one from their

perception of how the program goal statement currently applied to their present program and one from their perception of how the program goal statement would apply to their program in the future.

An example of typical questions in the survey to teachers and administrators is found in Table 1.

Table 1

Examples of Survey Questions

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	1. To develop handyman activities; adjusting and making minor repairs to the industrial products used within the home.	5 4 3 2 1
5 4 3 2 1	2. To develop creative solutions to present and future societal problems using technical means.	5 4 3 2 1
5 4 3 2 1	3. To develop an understanding of the application of science and mathematics.	5 4 3 2 1

Permission to adapt and use the 23 program goal statement questionnaire employed by Frey (1985) was secured in writing (see Appendix E). Adaptation of the instrument consisted of soliciting opinions from two viewpoints, as perceived in the present industrial arts program and as would be perceived in a future industrial arts program. Section II of the survey (see Appendix C) was developed to solicit demographic data and personal characteristics to specifically

address the research questions. The actual 23 program goal statements from the Frey (1985) study remained unchanged.

The sample groups for the survey were determined by a disproportionate, stratified, random sample of the populations. Stratification was by teaching level (public junior high and public senior high) for school principals and industrial arts teachers in the state of Nebraska. In addition, stratification of teachers, principals, and school board presidents by school size was employed according to "large" (class "A," top 32 high schools by enrollment, approximately 500) and "small" (class "B," "C," and "D," less than 500 high school enrollment). These classifications were identified by the Nebraska School Activities Association, Directory of Schools for 1986-87. Stratification was deemed necessary to augment the representativeness of the sample (Bailey, 1982). It should be noted that the sample of school board presidents was stratified by school size only.

Due to the relatively small counts for some cells that resulted from stratification, a "disproportionate" stratified random sample was drawn. This technique allowed the total population of the following small subgroups (cells) to be surveyed: (a) industrial arts teacher educators (N = 24), (b) principals of "small" junior high schools (N = 29), (c) principals of "large" senior high schools (N = 32), (d) industrial arts teachers in "small" junior high schools (N = 25), and (e) school board presidents in districts with "large" high schools (N = 20).

The utilization of disproportionate sampling (data from a total population in some cells, samples in others) requires that a weighting

factor be assigned to the disproportionate cells when generalized interpretations of the data from combined cells are to be reported (R. Jones, 1973; Bailey, 1982). Weighting factors were determined by calculating the inverse of the probability of a sample being selected (Bailey, 1982). For example, if a sample size of 40 was invited from a population size of 200, the probability of being selected would be one fifth. Therefore, the weighting factor would be five. The calculated weighting factors may be found in Table 2.

Sample size was determined employing the guidelines identified in the review of literature. Small subgroups of forty or less were surveyed in total. Large subgroups of more than forty were surveyed in sample sizes of approximately forty. These large subgroups were then weighted, as previously explained, to achieve proportionate status. Assuming a 75% return rate, the sample size would be 30, the minimum size recommended in the literature.

In September of 1986, The Nebraska Department of Education, Division of Management Information Services (NDE/DMIS), identified 630 public junior high and senior high industrial arts teachers in the State of Nebraska, of which 125 (20%) are junior high teachers and 505 (80%) are senior high teachers. In September of 1986, The Nebraska Department of Education, Division of Management Information Services, identified 400 public junior high and senior high principals in the State of Nebraska of which 75 (19%) are junior high principals and 325 (81%) are senior high principals. In October of 1986, The Nebraska Department of Education, Division of Information Management Services, identified 301 public school board presidents.

Table 2 represents populations (as reported by the NDE/DMIS), sample sizes, and weighting factors, respectively, for the cells as a result of stratification by level and school size.

Table 2

Population Sizes, Sample Sizes, and Weighting Factors

Population	Small Schools			Large Schools		
	N	n	f	N	n	f
125 Junior High Industrial Arts Teachers	25	25	1	100	40	2.5
505 Senior High Industrial Arts Teachers	362	40	9.05	143	40	3.58
75 Junior High Principals	29	29	1	46	40	1.15
325 Senior High Principals	293	42	7	32	32	1
301 School Board Presidents	281	40	7	20	20	1

Note. Key: N = Total Population as reported by the NDE/DMIS; n = sample size; f = weighting factor as described by Bailey (1982).

A pilot test of the survey instrument (validated by the 5 members of the research committee), as approved in the literature (Gay, 1981), was administered to solicit suggestions for improvement in format, content, and wording. A random group from the survey populations (who were not randomly selected to be a part of the final sample population), office staff, co-workers, and fellow doctoral students comprised the group for the pilot test. Bailey (1982) approves this method when he states that ". . . researchers need not be careful that the pretest

respondents have the exact characteristics of the respondents in the final study" (p. 150). The instruments were modified as necessary. Modifications included minor changes in format and clarification of directions. No changes were made to the 23 original program goal statements as identified in the Frey (1985) study. The instruments were mailed, along with cover letters (see Appendix A) and stamped self-addressed return envelopes, on November 21, 1986. The survey samples were asked to return the questionnaire within three days. A coding system on the survey was used to trace non-respondents. On November 29, 1986 a follow-up post card was mailed to non-respondents asking them to return the questionnaire upon receipt of the reminder. If after five days there was no response to the follow-up letter, a second questionnaire and return envelope were mailed. If after five days there was no response, and a 50% return rate had not been achieved, a telephone call was made encouraging the nonrespondent to return the questionnaire as soon as possible.

A return rate of 50% was determined sufficient for valid data analysis (Babbie, 1973), however, a 70% return rate is preferred (Gay, 1981) and was used as the target return rate for this study. Babbie (1973) reports that by using this three-step follow-up (post card, second survey, phone call) at least a 75% return rate should be achieved. Chapter 4, Interpretation and Presentation of Data, contains the return rates for the various sample groups.

DATA ANALYSIS PROCEDURES

The data were statistically analyzed to determine if there was a significant correlation between respondent characteristics on the

current and desired goals of the industrial arts program. The statistical data analysis was accomplished by computer using the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975), software package on the I.B.M. mainframe computer at the state capitol in Lincoln, Nebraska. The following statistical tests were employed: (a) oneway analysis of variance, to test differences of the four major groups, (b) the Chi-square test for independence, to determine if there existed a lack of statistically significant association between personal characteristics of the subgroups, and (c) the matched pairs t-test (correlated t) to estimate any statistically significant difference between present and future perspectives on the program goals of industrial arts. An alpha level of .05 was used.

SPSS subprogram ONEWAY was used for analysis of variance. Subprogram CROSSTABS was the preferred approach for the Chi-square statistic. Subprogram FREQUENCIES was used to prepare frequency tables to report raw and cumulative frequencies and percentages. Subprogram T-TEST for matched pairs was used to determine the existence of significant differences between present and future perspective. SPSS function WEIGHTFACTOR was used to return samples to proportionate status.

For example, the Chi-square test of independence was used in conjunction with the crosstabulation of industrial arts teachers who were members and nonmembers of state professional organizations and their reported responses to the 23 program goal statements. The Chi-square test for independence tests whether the difference between

observed and expected frequencies of a contingency table can be attributed to chance and determines the probability of this difference being a chance difference. For purposes of clarification, an example of crosstabulation and the Chi square test, as was applied in this study, is presented in Table 3. The calculated value (00.86) is below the critical value (3.84) and therefore would not reject, at the .05 level of significance, the hypothesis that there is no difference in the opinions of members and nonmembers of state professional organizations concerning the importance of the stated program goal for industrial arts as perceived in the present program. A difference does not exist between members and nonmembers concerning their perceptions of the importance of handyman activities in the present industrial arts program.

Table 3

Example of the Chi-square Statistic to Determine the Existence of Relationship between Variables within Population Samples

Goal Statement # 1 (Present Status): To develop handyman activities; adjusting and making minor repairs to the industrial products within the home.

Frequency Row Pct Col Pct Tot Pct	Non-member of State Professional Organizations	Member of State Professional Organizations	TOTAL
	37	38	75
Not A	49.2	50.8	19.1
Goal	17.4	21.1	--
	9.4	9.7	--
	174	141	315
Program	55.2	44.8	80.9
Goal	82.6	78.9	--
	44.6	36.2	--
	211	179	390
TOTAL	51.1	45.9	100.0

Observed responses = 390 Chi-square = 00.86
Critical value of Chi-square at the .05 level = 3.84
Degrees of freedom = 1 Prob = .3533

Note. Not a goal = slightly important or not a program goal; Goal = very important and important program goal; row pct = row percent; col pct = column percent; -- = inapplicable; prob = probability.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Chapter 4 includes the presentation and analysis of data collected from the samples of full-time active industrial arts teachers, school principals, and school board presidents in the public schools, and from the industrial arts teacher educators in the State of Nebraska. It should be noted that the numbers indicated for respondents are the results after applying the weighting factors indicated in Chapter 3 (see Table 2). Weighting factors were necessarily applied to adjust the disproportionate sample to proportionate status. Chapter 3 provides a detailed discussion of the weighting system for disproportionate samples.

RESPONSE TO DATA COLLECTION QUESTIONNAIRE

A total of 369 survey questionnaires were mailed to 11 subgroup samples of the population to be studied. Two follow-up contacts were made to the nonrespondents of the initial mailing of the survey questionnaire. With the exception of two of the subgroups, school board presidents of small and large schools, all subgroups exceeded the target return rate of 75%. These two exceptions, however, did exceed the 50% return rate determined as necessary by the literature for meaningful statistical analysis. Four questionnaires were returned unanswered and one was returned partially completed. As a result, these questionnaires were excluded from the data analysis. The overall response of the 11

subgroups yielded an 85% response rate. Table 4 presents the response rates of the four groups simultaneously for purposes of comparison.

Table 4

Response Rate of All Survey Groups Classified by School Size

Survey Group	School Size	Number Mailed	Number Returned	Percent Returned
Teachers	Large (over 500)	80	68	85
	Small (1-500)	63	54	86
TOTAL		143	122	85
Principals	Large (over 500)	72	64	89
	Small (1-500)	71	70	99
TOTAL		143	134	93
School Board Presidents	Large (over 500)	21	13	62
	Small (1-500)	39	21	54
TOTAL		60	34	57
Industrial Arts Teacher Educators	--	23	23	100

Note. -- = inapplicable.

The presentation of return rates for the individual groups of interest follows.

Industrial Arts Teachers

A stratified, disproportionate random sample of the 625 industrial arts teachers in the State of Nebraska resulted in collection of data from four subgroups. These subgroups were determined by the strata of teaching level (junior high/senior high) and school size (small/large). Data in Table 5 represent the return rates of industrial arts teachers upon stratification. Industrial arts teachers in large senior high schools responded with the highest return rate (93%), while their colleagues in the small high schools responded with an 85% return rate. Junior high industrial arts teachers from small schools returned 87% of the questionnaires, while their colleagues in the large schools returned 78%. As a result of the three-step contact, the sample of 63 junior high industrial arts teachers responded with an 81% return rate. The sample of 80 senior high industrial arts teachers responded with a somewhat higher return rate of 89%.

Building Principals

The data in Table 6 indicate that the overall return rate percentage of building principals in schools with industrial arts programs was exceptionally high. The highest return rate in this section was received from senior high principals. After three contacts, the 74 principals of senior high schools in both small and large schools responded with a 100% return rate. The 69 principals surveyed at the junior high school level responded with an 87% return rate. Principals

of large junior high schools responded with an 80% return rate, while principals in small junior high schools responded with a 97% return rate.

Table 5

Response Rate of Industrial Arts Teachers by School Size and Teaching Level

Level	School Size	Number Mailed	Number Returned: First Contact	Second Contact	Third Contact	Total Return	Percent Return
Junior High (N = 125)	Large (over 500)	40	28	0	3	31	78
	Small (1-500)	23	12	3	5	20	87
TOTAL 80.95		63	40	3	8	51	
Senior High (N = 505)	Large (over 500)	40	27	2	8	37	93
	Small (1-500)	40	25	5	4	34	85
TOTAL		80	52	7	12	71	89

Note. N = total number of Nebraska teachers in a specific stratum

School Board Presidents

Table 7 displays the return rate percentages of school board presidents of school districts containing small and large schools. After three contacts, 13 of the 21 school board presidents of large schools returned the questionnaire for a return rate of 62%. Similarly,

21 of the 39 school board presidents of small schools returned the questionnaire for a return rate of 54%. The overall return rate for school board presidents was 57%.

Table 6

Response Rate of Building Principals Classified by School Size and Teaching Level

Level	School Size	Number Mailed	Number Returned				
			First Contact	Second Contact	Third Contact	Total Return	Percent Return
Junior High (N = 75)	Large (over 500)	40	27	3	2	32	80
	Small (1-500)	29	26	1	1	28	96
TOTAL		69	53	4	3	60	86
Senior High (N = 325)	Large (over 500)	32	23	3	6	32	100
	Small (1-500)	42	36	2	4	42	100
TOTAL		74	59	5	10	74	100

Note. N = total number of Nebraska principals in a specific stratum.

Two factors may have attributed to the somewhat low (in comparison to other subgroups) response rate. Written and oral comments to the researcher indicated that some school board presidents did not perceive themselves as qualified to answer the questionnaire in light of specific industrial arts goals and indicated that the perceptions of their

respective school principals may have more validity. The second factor may have been an error in timing due to the fact that most school boards meet on a monthly basis, therefore the survey follow-ups may not have had their anticipated impact. However, it should be noted that both groups (small and large) did exceed the 50% minimum return rate suggested by the literature review of research methods.

Table 7

Response Rate of School Board Presidents by School Size

	School Size	Number Mailed	Number Returned: First Contact	Second Contact	Third Contact	Total Return	Percent Return
	Large (over 500)	21	7	1	5	13	62
(N = 301)	Small (1-500)	39	15	3	3	21	54
TOTAL		60	22	4	8	34	57

Note. N = total number of school board presidents in Nebraska.

Industrial Arts Teacher Educators

Industrial arts teacher educators from the four state colleges in Nebraska (Chadron, Kearney, Peru, and Wayne) and from the University of Nebraska at Lincoln, also returned the questionnaire at a 100% rate after three contacts. Table 8 represents the number mailed, number returned at various intervals, and resulting percentage.

Table 8

Response Rate of Industrial Arts Teacher Educators

	Number Mailed	Number Returned				
		First Contact	Second Contact	Third Contact	Total Return	Percent Return
(N = 23) Industrial Arts Teacher Educators	23	19	2	2	23	100

Note. N = total number of Nebraska industrial arts teacher educators.

PERSONAL DATA AND SAMPLE CHARACTERISTICS

The survey questionnaire was comprised of two sections (I and II). Section II (see Appendix C) contained nine items relative to personal characteristics of industrial arts teachers.

The following tables, 9 though 20, were generated from Section II of the questionnaire. Due to incompleteness, one questionnaire was eliminated from the analysis. Responses to the nine items were crosstabulated by teaching level and school size for more meaningful comparisons.

Section II, item 1, solicited information pertaining to the number of periods per day taught by industrial arts teachers at various levels of grade 7 through grade 12. Calculations of the data from this item classified the respondents of the questionnaire as either junior high teachers or senior high teachers. That is, if the respondent indicated teaching more periods of grade 7 through grade 9 than grade 9 through

grade 12, the respondent was considered a junior high teacher. Based on this premise, the percentage of the respondents calculated as junior high or senior high teachers (14.7% and 85.3%, respectively) compares favorably with the actual percentage of junior high and senior high teachers in the state (19.8% and 80.2%, respectively). Similarly, the percentage of industrial arts teachers responding from large schools compared to small schools was 39% and 61%, respectively; while the actual percentage of industrial arts teachers in large and small schools is 39% and 61%, respectively. Thus no teaching level or school size was overrepresented or underrepresented when comparing industrial arts teachers.

Data in Table 9 compare the actual number and actual percentage of industrial arts teachers in the state (as determined by Nebraska State Department of Education records) stratified by teaching level and school size with the number and percentage of respondents stratified by teaching level and school size. For example, 20% of the junior high industrial arts teachers in Nebraska teach in small schools. This compares favorably with the percentage (20%) of teachers in small junior high schools in the final sample.

A similar crosstabulation was conducted to determine the representativeness of school principals at the various strata (school size and teaching level). Junior high and senior high principals from small schools were somewhat overrepresented (8% and 18%, respectively). When stratified by school size, principals of large schools were slightly (9%) overrepresented, and the representativeness of principals of small schools was almost perfectly (0.29% difference) proportioned.

Table 9

Representativeness of Sample of Industrial Arts Teachers by School Size and Teaching Level

	Small				Large			
	Actual N	Actual %(row) %(col)	Return N	Return %(row) %(col)	Actual N	Actual %(row) %(col)	Return N	Return %(row) %(col)
Junior High	25	20.00 6.45	20	20.41 6.10	100	80.00 41.15	78	79.59 37.14
Senior High	362	71.68 93.55	308	70.00 93.90	143	28.32 58.85	132	30.00 62.86

Note. Actual N = actual number of industrial arts teachers at various strata; Actual % = actual percentage (rounded) of industrial arts teachers at various strata; Return N = number of respondents at various strata; Return % = percentage (rounded) of various strata represented by the returns; %(row) = percentage (rounded) represented by specific row; %(col) = percentage (rounded) represented by specific column.

Table 10 compares the actual number and percentages of principals with number and percentages of respondents, stratified by school size and teaching level.

Representativeness of school board presidents as a result of sampling appeared to be similar to the actual percentage of school board presidents (1.49% difference). Table 11 presents the actual and sample number and percentages of school board presidents upon stratification by school size.

Table 10

Representativeness of Sample of Principals by School Size and Level

	Small				Large			
	Actual N	Actual %(row) %(col)	Return N	Return %(row) %(col)	Actual N	Actual %(row) %(col)	Return N	Return %(row) %(col)
Junior High	29	38.67 9.01	28	46.67 8.72	46	61.33 58.97	32	53.33 50.00
Senior High	293	71.68 90.99	293	90.15 91.28	32	28.32 41.03	32	9.85 50.00

Note. Actual N = actual number of school principals at various strata; Actual % = actual percentage (rounded) of school principals at various strata; Return N = number of respondents at various strata; Return % = percentage (rounded) of various strata represented by the returns; %(row) = percentage (rounded) represented by specific row; %(col) = percentage (rounded) represented by specific column.

Table 11

Representativeness of Sample of School Board Presidents by School Size

	Small				Large			
	Actual N	Actual %(row)	Return N	Return %(row)	Actual N	Actual %(row)	Return N	Return %(row)
	281	93.36	147	91.87	20	6.64	13	8.13

Note. Actual N = actual number of school board presidents at various strata; Actual % = actual percentage (rounded) of school board presidents at various strata; Return N = number of respondents at various strata; Return % = percentage (rounded) of various strata represented by the returns; %(row) = percentage (rounded) represented by specific row.

Upon analysis, section II, item 1, indicated the number of periods per day taught by industrial arts teachers. These data were generalized to three categories: one to three periods per day, four to six periods per day, and seven or more periods per day. Of the industrial arts teachers who responded, 4% indicated that they taught one to three periods per day. The majority of the respondents (62%) indicated that they taught from four to six periods per day, while the remainder (34%) of the respondents taught seven or more periods per day. Table 12 presents the number and percentage of industrial arts teachers and their respective class loads.

Section II, item 2, asked respondents to indicate the highest level of education attained. Table 13 presents the number and percentage of industrial arts teachers who have attained the bachelors, masters, masters plus 30 hours, educational specialist, and doctorate degree level of education. These data are presented in both strata, school size and teaching level. When the sample data are extrapolated to the population of industrial arts teachers in Nebraska, 56% have attained a bachelors degree. An additional 27% have attained a masters degree, 14% have a masters degree plus at least an additional 30 credit hours and 4% have an educational specialist degree. None of the respondents indicated attainment of the doctorate degree. Teachers in large schools and teachers in junior high schools had achieved higher levels of education than their colleagues in small schools or in senior high schools.

Table 12

Teaching Load of Industrial Arts Teachers by Periods per Day

	f	cf	%	c%
1 to 3 Periods Per Day	21	21	3.90	3.90
4 to 6 Periods Per Day	333	354	61.90	65.80
7 or More Periods Per Day	184	538	34.20	100.00
Nonrespondents	0	538	--	--

Note. f = frequency; cf = cumulative frequency; % = percent; c% = rounded cumulative percent; -- = inapplicable.

Table 13

Number and Percentage of Industrial Arts Teachers by Educational Attainment, Teaching Level, and School Size

	B.A.		M.A.		M.A.+30		E.D.S.		Doc.	
Stratum	No.	%	No.	%	No.	%	No.	%	No.	%
Junior High	35	36.9	31	31.8	28	28.7	3	2.6	0	0.0
Senior High	268	60.8	112	25.3	45	10.2	16	3.7	0	0.0
Small Schools	246	75.2	60	18.3	12	3.7	9	2.8	0	0.0
Large Schools	57	27.2	82	39.2	61	29.0	10	4.6	0	0.0
TOTAL %		56.4		26.4		13.6		3.6		0.0

Note. B.A. = Bachelors Degree; M.A. = Masters Degree; M.A.+30 = Masters Degree plus 30 additional credit hours; E.D.S. = Educational Specialist Degree; Doc. = Doctorate Degree; No. = number; % = rounded row percent.

Item 3 in Section II of the questionnaire addressed the number of years of industrial arts teaching experience in grades 7 through 12. The majority, or 39%, of the respondents had taught 15 years or more in the area of industrial arts. The remaining three categories were somewhat evenly divided; 19% had one to four years of industrial arts teaching experience; 19% had from five to nine years of experience; and 24% had from 10 to 14 years of industrial arts teaching experience. Table 14 indicates data relative to the respective number of years of teaching experience in industrial arts, as stratified by school size and teaching level. Teachers in large schools and teachers in junior high schools tended to be more experienced teachers.

Table 14

Number and Percentage of Industrial Arts Teachers by Years of Experience, Teaching Level, and School Size

	0-4 yrs		5-9 yrs		10-14 yrs		15 or more	
Stratum	No.	%	No.	%	No.	%	No.	%
Junior High	7	7.2	15	15.4	25	25.6	51	51.8
Senior High	96	21.8	85	19.3	101	22.9	159	36.0
Small Schools	83	25.4	68	20.9	77	23.6	98	30.1
Large Schools	19	9.2	31	15.0	49	23.2	111	52.6
TOTAL %		19.0		18.5		23.5		39.0

Note. yrs = years; No. = number; % = rounded row percent.

Item 4 in Section II asked respondents to indicate their level of teacher certification. Nominal levels were: fully certified, provisionally certified, and not certified. The majority (96%) of Nebraska industrial arts teachers were fully certified. Two percent were provisionally certified and 2% were not certified to teach in the area of industrial arts. Table 15 presents the number and percentage of industrial arts teachers and their respective level of teacher certification as stratified by school size and teaching level. The vast majority of teachers were fully certified. However, those reporting not being certified were teaching in large senior high schools.

Table 15

Number and Percentage of Industrial Arts Teachers by Certification Status, Teaching Level, and School Size

	Fully Certified		Provisionally Certified		Not Certified	
Stratum	No.	%	No.	%	No.	%
Junior High	98	100.0	0	0.0	0	0.0
Senior High	418	95.1	13	2.9	9	2.1
Small Schools	310	94.5	9	2.8	9	2.8
Large Schools	206	98.1	4	1.9	0	0.0
TOTAL %		95.9		2.4		1.7

Note. No. = number; % = rounded row percent.

Membership of industrial arts teachers in national professional organizations was of interest to this research study. Industrial arts teachers were asked to respond to Section II, item 5, relative to their membership in (a) the International Technology Education Association (ITEA, formerly AIAA), (b) the American Vocational Association (AVA), (c) Epsilon Pi Tau (EPT), and (d) other. Of those industrial arts teachers responding, 63% indicated they were not members of any national professional organizations. Membership in the International Technology Education Association was reported by 30% of the teachers. The American Vocational Association was indicated by 8% as an organization in which respondents held membership, while 9% of the industrial arts teachers indicated they were members of Epsilon Pi Tau, the international honorary fraternity for industrial arts. Data in Table 16 present the response to this item as stratified by teaching level and school size. Not displayed in Table 16 were the respondents (7%) who indicated membership in more than one national professional organization and those (3%) who held membership in more than two national professional organizations for industrial arts.

Item 6 in Section II of the questionnaire solicited information about industrial arts teachers' memberships in state professional organizations. Fifty percent indicated they were not members of any Nebraska state professional organization for industrial arts. Forty-nine percent held membership in the Nebraska Industrial Education Association (NIEA, recently renamed the Nebraska Industrial Technology Education Association, NITEA). Seven percent were members of the Nebraska Vocational Association (NVA) and 2% indicated they were

Table 16

Number and Percentage of Industrial Arts Teachers by Membership in National Professional Organizations by Teaching Level and School Size

	none		ITEA		AVA		EPT		other	
Stratum	No.	%	No.	%	No.	%	No.	%	No.	%
Junior High	62	63.3	34	34.7	7	7.1	4	4.1	3	3.0
Senior High	274	62.3	128	29.1	36	8.2	45	10.2	21	4.8
Small Schools	213	64.9	85	25.9	20	6.1	46	14.0	10	3.0
Large Schools	123	58.6	77	36.7	23	11.0	3	1.0	14	6.7
TOTAL %		62.5		30.0		8.0		9.1		4.5

Note. No. = number; % = rounded percent (not cumulative by row or column, since respondents could select more than one choice on this item); ITEA = International Technology Education Association; AVA = American Vocational Association; EPT = Epsilon Pi Tau.

members of other Nebraska state professional organizations. Seven percent indicated membership in two state professional organizations while 1% held membership in more than two state professional organizations for industrial arts. Table 17 presents the number and percentage of industrial arts teachers that are members of these organizations, stratified by teaching level and school size. Teachers in junior high schools and those in large schools were much more likely to belong to state professional organizations.

Section II, item 7, solicited the age (in 10 year intervals) of industrial arts teachers. The majority (44%) of the industrial arts

teachers responding indicated their age to be between 31 and 40 years. The intervals of 21 to 30 years and 41 to 50 years were similarly divided with 21% and 22%, respectively. Thirteen percent of the

Table 17

Number and Percentage of Industrial Arts Teachers by Membership in State Professional Organizations by Teaching Level and School Size

	none		NIEA		NVA		other	
Stratum	No.	%	No.	%	No.	%	No.	%
Junior High	34	34.5	63	64.3	9	9.2	0	0.0
Senior High	235	53.4	202	45.9	4	1.0	17	3.9
Small Schools	208	63.4	119	36.3	10	3.0	9	2.7
Large Schools	61	29.0	146	69.5	26	12.4	4	1.9
TOTAL %		50.0		49.3		6.7		2.4

Note. No. = number; % = rounded percent (not cumulative by row or column, since respondents could select more than one choice on this item); NIEA = Nebraska Industrial Education Association; NVA = Nebraska Vocational Association.

respondents indicated their age to be between 51 and 60 years, while none of the respondents reported being over 60 years of age. Table 18 displays the frequency of age (by intervals) of industrial arts teachers upon stratification by teaching level and school size. It appeared that teachers in large schools were older and teachers in junior high schools

were slightly older. However, the majority of teachers appeared to be relatively young (31-40 years).

Table 18

Number and Percentage of Industrial Arts Teachers by Age, Teaching Level, and School Size

	21-30 yr		31-40 yr		41-50 yr		51-60 yr		over 60	
Stratum	No.	%	No.	%	No.	%	No.	%	No.	%
Junior High	13	13.3	46	46.9	21	21.4	19	19.4	0	0.0
Senior High	99	22.1	199	44.4	96	21.4	54	12.5	0	0.0
Small Schools	86	26.1	153	46.5	69	21.0	19	5.8	0	0.0
Large Schools	25	12.0	84	40.2	47	22.5	53	25.3	0	0.0
TOTAL %		20.6		44.1		22.3		13.4		0.0

Note. % = rounded row percentage; No. = number; yr = years.

Five public state colleges or universities in Nebraska granted a bachelors degree in industrial arts. They included: Chadron State College, Kearney State College, Peru State College, the University of Nebraska, and Wayne State College. Item 8, Section II, asked industrial arts teachers to indicate from which institution they received their bachelors degree or, if it was received out of state, to so indicate. Ten percent reported that they received the bachelors degree from Chadron State. The majority (27%) indicated Kearney State as their

bachelors degree granting institution, 15% reported Peru State, while 17% indicated the University of Nebraska (Lincoln or Omaha) as the source of their bachelors degree. Thirteen percent received their bachelors degree out of state. It appeared that bachelors degree graduates of small colleges (Chadron, Wayne, and Peru) tended to teach in small schools and graduates of large colleges (Kearney and the University of Nebraska) tended to teach in large schools. Table 19 summarizes the data on source of bachelors degree as stratified by teaching level and school size.

Table 19

Number and Percentage of Industrial Arts Teachers by Source of Bachelors Degree, Teaching Level, and School Size

	Chadron		Kearney		Peru		Wayne		U.N.L.		Outstate	
Stratum	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Jr. Hi.	2	2.0	24	24.2	7	7.1	19	19.2	30	30.3	17	17.2
Sr. Hi.	52	11.8	123	28.0	74	16.8	74	16.8	63	14.3	54	12.3
Small	47	14.4	76	23.3	67	20.6	67	20.6	29	8.9	40	12.3
Large	7	3.3	70	33.5	13	6.2	26	12.4	63	30.1	30	14.4
TOTAL %		10.0		27.1		14.9		17.3		17.1		13.0

Note. % = rounded row percentage; No. = number; Jr. Hi. = Junior High; Sr. Hi. = Senior High.

Information was also sought, via item 9, Section II, on source of the respondent's masters degree. Masters degrees are granted by the same six institutions reported in Table 19 (concerning source of bachelors degree). However, Peru State has only recently begun granting this degree, therefore it was eliminated from the tabulations. Table 20 indicates that the majority (36%) of industrial arts teachers received their masters degree from Kearney State while the next most popular institution was the University of Nebraska, indicated by 28% of the respondents. Graduates with masters degrees from Wayne State accounted for 18%, while an additional 18% received their degree out of state.

Table 20

Number and Percentage of Industrial Arts Teachers by Source of Masters Degree, Teaching Level, and School Size

	Chadron		Kearney		Wayne		U.N.L.		Outstate	
Stratum	No.	%	No.	%	No.	%	No.	%	No.	%
Junior High	1	1.6	18	29.0	11	17.7	19	30.6	13	21.0
Senior High	0	0.0	63	38.4	29	17.7	45	27.4	27	16.5
Small Schools	1	1.4	30	41.7	19	26.4	10	13.9	12	16.7
Large Schools	0	0.0	51	33.3	21	13.7	53	34.6	28	18.3
TOTAL %		0.0		36.0		17.8		28.0		17.8

Note. % = rounded row percentage; No. = number; yr = years; Table includes only teachers with a masters degree of beyond.

DATA ADDRESSING THE RESEARCH QUESTIONS

Introduction

Research questions were developed to address the problem of study. The appropriate research procedures, data collection population, and statistical data analyses evolved from the research questions. A questionnaire was employed to collect the desired data. Section I of the questionnaire contained a listing of 23 program goal statements (see Appendix B). A listing of the condensed program goals from Frey's (1985, p. 86) study follows:

1. Handyman activities. (*T)
2. Solution to societal problems. (*C)
3. Application of science and math. (*C)
4. Habits of health and safety. (*T)
5. Develop technical talents. (*T)
6. Work, leisure, and citizenship. (*C)
7. Discover interests and aptitudes. (*T)
8. Changes in materials, industrial processes, and products. (*C)
9. Good workmanship and design. (*T)
10. Evolution and relationships of society, technical means. (*C)
11. Educational and occupational choices. (*T)
12. Leisure time interests. (*T)
13. Integration of educational studies. (*C)
14. Vocational training. (*T)
15. Nature and characteristics of technology. (*C)
16. Technical skill and knowledge. (*T)
17. Beliefs and values based on the impact of technology. (*C)
18. Tools, techniques, and resources of industry/technology. (*T)
19. Problem-solving skills. (*T)
20. Consumer knowledge. (*T)
21. Insight into industry. (*T)
22. Understanding of technical culture. (*C)
23. Prevocational experiences. (*T)

In the above listing, *T represents those goals that were defined as traditional in nature, and *C, those goals that were defined as contemporary in nature. It should be noted that the traditional and contemporary classification system was not a part of Frey's listing and was employed only in this study. The statements were rated two times

each; once from the respondent's perception of the goal statement as it applied to the respondent's present program and once from the respondent's perception of the goal statement as it may have applied to the respondent's future program. A five-point Likert rating scale was used to report a respondent's level of importance relative to each of the program goals. All statistics were based on frequencies and means of responses at various rating levels.

The results of the data analysis are presented in the order of the research questions and address each question independently. Research questions 1, 2, and 3 were addressed by oneway analyses of variance of the 23 program goal ratings (from two perspectives) in Section I of the questionnaire (see Appendix B). The independent variable consisted of the following positions: (a) industrial arts teachers, (b) industrial arts teacher educators, (c) school principals, and (d) school board presidents. Research question 2 was addressed by two analyses of variance; one for small schools and one for large schools. Similarly, research question 3 was addressed by two analyses of variance; one for junior high and one for senior high.

Research questions 4 through 11 were addressed by crosstabulation of the 23 goal statement ratings in Section I with the personal characteristics reported in Section II of the survey. The independent variables in these procedures were (a) membership in national and state professional organizations, (b) source of bachelors degree, (c) source of masters degree, (d) class load, (e) level of education attained, (f) teaching experience, (g) age, and (h) certification status. In all crosstabulation procedures, the Likert rating measured the dependent

variable. The five-point Likert scale was collapsed to a two-point nominal scale of "high" and "low" with the "3" rating of the original scale eliminated from the analysis.

Group mean differences were computed to specifically address research question 12. The two-tailed t-test for matched pairs was the statistical test of significance employed to determine differences between present and future perspectives.

All statistics were calculated at the .05 level of significance. This is interpreted to mean that the chance of obtaining a Type I error was less than 5 times out of 100. Type I errors are committed when significant differences should actually have been attributed to sampling error rather than differences in the population.

Research Question 1

Were there differences among industrial arts teachers, industrial arts teacher educators, school principals, and school board presidents on perceived present and future program goals of industrial arts as measured by the oneway analysis of variance?

In an effort to determine if the various groups surveyed differed on their opinions of the importance of program goals for industrial arts, all groups were asked to rate the 23 goals as 5) very important, 4) important, 3) moderately important, 2) slightly important, or 1) not a program goal. In addition, they were also asked to rate the program goals from two perspectives, (a) application to their present programs and (b) application to their future programs.

A oneway analysis of variance among the four representative groups was employed to determine the existence of significant differences

between group mean goal ratings. Thus no comparisons were made between present and future perspective. The F ratio statistic, at the .05 level, was employed as the appropriate test of significance. The analysis revealed a significant difference between the groups relative to their ratings on 22 (96%) of the program goals as perceived in their present programs (see Table 21). It must be noted that data in Table 21 do not attempt to statistically compare present and future perspectives. Both perspectives are included only for reading convenience. For example, the first entry in Table 21 (14.69*) indicates that there was a significant difference in the mean ratings of the various groups concerning item 1, as perceived in the present program. An example of the typical oneway analysis of variance for research question 1 can be found in Appendix D, Table D-1. The present program goal which did not yield a significant rating difference was item number 13 which addressed the integration of education studies. Groups agreed that this was a moderately important program goal.

Research Question 2

Were there differences among school principals, school board presidents, and industrial arts teachers of small schools compared with large schools regarding their perception of present and future program goals of industrial arts as measured by a oneway analysis of variance?

A oneway analysis of variance was employed to determine if significant differences were apparent in ratings of program goals by industrial arts teachers, school principals, and school board

Table 21

Weighted Group Means, by Position, and F Ratios

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Position I.A. Teach. Mean	School Princ. Mean	S.B. Pres. Mean	Teach. Educ. Mean	F Ratio
P-1	Handyman activities	3.59	3.35	3.09	2.61	14.69*
F-1		3.84	3.54	3.59	2.35	21.01*
P-2	Solution to societal problems	3.23	3.03	2.95	3.56	5.59*
F-2		3.93	3.73	3.61	4.39	8.81*
P-3	Application of science and math	3.49	3.30	3.62	3.39	4.49*
F-3		4.18	3.84	3.95	4.52	13.12*
P-4	Habits of health and safety	4.82	4.49	3.86	4.00	68.38*
F-4		4.85	4.61	4.30	4.00	38.51*
P-5	Develop technical talents	4.05	3.80	3.25	3.91	30.01*
F-5		4.33	4.23	3.98	4.26	8.23*
P-6	Work, leisure, and citizenship	3.78	3.52	2.79	3.52	37.82*
F-6		4.04	4.06	3.49	4.35	19.11*
P-7	Discover interests and aptitudes	3.81	3.85	3.23	3.74	15.88*
F-7		4.10	4.16	3.59	3.96	14.73*
P-8	Changes in materials, industrial processes,	3.59	3.47	3.01	3.96	15.19*
F-8	and products	4.20	4.12	3.73	4.26	11.43*
P-9	Good workmanship and design	4.49	4.12	3.59	3.87	53.19*
F-9		4.52	4.30	3.81	3.65	44.39*
P-10	Evolution and relationships of society	2.79	2.93	2.36	3.22	12.96*
F-10	and technical means	3.39	3.52	2.79	4.22	22.51*
P-11	Educational and occupational choices	3.81	3.77	3.45	3.74	4.80*
F-11		4.15	4.34	4.15	4.09	3.33*
P-12	Leisure time interests	3.42	3.50	2.88	2.96	19.31*
F-12		3.61	3.66	3.24	2.87	9.77*
P-13	Integration of educational studies	3.36	3.45	3.21	3.30	1.79
F-13		3.93	3.92	3.57	4.22	7.67*

Table 21 (continued)

P-14	Vocational training	3.65	3.95	3.34	3.00	14.91*
F-14		4.00	4.13	4.00	2.74	12.06*
P-15	Nature and characteristic of technology	3.28	3.21	2.73	3.43	14.28*
F-15		3.91	3.84	3.20	4.57	34.16*
P-16	Technical skill and knowledge	3.86	3.54	3.24	3.65	21.38*
F-16		4.10	3.90	3.56	3.70	17.05*
P-17	Beliefs and values based on the impact	2.95	3.01	2.48	3.30	11.55*
F-17	of technology	3.63	3.75	3.12	4.22	17.32*
P-18	Tools, techniques, and resources of	4.25	4.09	3.52	4.00	27.94*
F-18	industry/technology	4.37	4.36	3.96	4.22	11.60*
P-19	Problem-solving skills	4.02	3.72	3.43	3.96	16.18*
F-19		4.46	4.33	4.03	4.57	11.87*
P-20	Consumer knowledge	3.70	3.67	2.81	3.30	30.29*
F-20		4.04	4.02	3.39	3.39	23.41*
P-21	Insight into industry	3.35	3.16	2.61	3.78	26.55*
F-21		3.80	3.68	2.99	4.13	32.35*
P-22	Understanding of technical culture	3.04	3.03	2.54	3.35	11.42*
F-22		3.56	3.61	3.03	4.22	19.21*
P-23	Prevocational experiences	3.50	3.58	2.90	3.17	13.34*
F-23		3.79	3.90	3.69	3.09	4.26*

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal; P = present perspective; F = future perspective. Key (Likert scale) was used to calculate means.
$F(3,1107) = 2.60$, $*p < .05$.

presidents. Thus, no comparisons were made between present and future perspectives. This analysis was repeated four times; to determine significant differences for small schools from present and future perspectives, and for large schools from present and future perspectives. The F ratio statistic, at the .05 level, was applied as

the appropriate test of significance. It must be noted that data in Table 22 and 23 do not attempt to statistically compare present and future perspectives. Both perspectives are included only for reading convenience. For example, the first entry in Table 22 (19.60*) indicates that there was a significant difference in the mean ratings of the various groups concerning item 1 as perceived in the present program. An example of the typical oneway analysis of variance for research question 2 can be found in Appendix D, Table D-2.

When program goals were rated as perceived in their present programs, industrial arts teachers, school principals, and school board presidents of large schools differed significantly on eight (35%) of the program goals. These consisted of items 4, 5, 9, 16, 18, 19, 20, and 21. These items addressed traditional goals of industrial arts such as safety, technical skill and talent, use of tools, and consumer information. In general, these goals were rated higher than the statistically non-significant goals. This would seem to indicate that positions in large schools tend to agree that contemporary goals are somewhat less important, but tend to disagree on the greater importance indicated for traditional goals in present programs.

Teachers, principals, and school board presidents also differed when rating program goals from their perception of future programs. Respondents representative of large schools rated 12 (52%) of the program goals differently at the .05 level of significance. These goals were represented by items 4, 8, 9, 11, 12, 15, 17, 18, 19, 20, 21, and 22, which pertained to primarily traditional goals such as safety, workmanship, industrial processes, leisure interests, and consumer

knowledge. However, contemporary goals such as understanding technical culture, beliefs and values based on technology, and the nature and characteristics of technology, were also rated significantly different by positions within large schools, although they were rated somewhat less in importance. This would seem to indicate that some positions in large schools would consider some contemporary goals important for future programs.

Ratings by all groups from small schools differed significantly on 21 (91%) of the future program goals. The two exceptions were the program goals (items 14 and 23) addressing the concepts of vocational training and prevocational experiences. As was true from present program perspective, respondents of small schools reported considerably more difference in opinion on program goals for the future than did large school respondents.

Differences among teachers, principals, and school board presidents appeared to be substantially more prevalent in small schools. Large school respondents differed more often when rating program goals from the future perspective (12 items different) than from the present perspective (9 items different). This would seem to indicate an increasing tendency for disagreement on the future role of industrial arts by large schools.

Table 22 (small schools) and Table 23 (large schools) display a brief description of the program goals, the calculated F ratio values, and an indication of significance upon the oneway analysis of variance. Ratings from present and future perspectives are displayed in the same table for reading convenience only. An example of the typical oneway

Table 22

Weighted Group Means and F Ratios by Position in Small Schools and by Present and Future Perspective

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Position I.A. Teach. Mean	Position School Princ. Mean	Position S.B. Pres. Mean	F Ratio
P-1	Handyman activities	3.76	3.36	3.10	19.60*
F-1		3.95	3.56	3.62	14.42*
P-2	Solution to societal problems	3.25	3.06	2.90	5.67*
F-2		3.87	3.68	3.57	5.85*
P-3	Application of science and math	3.53	3.32	3.62	5.44*
F-3		4.18	3.81	3.95	14.25*
P-4	Habits of health and safety	4.82	4.52	3.86	74.40*
F-4		4.88	4.60	4.33	41.10*
P-5	Develop technical talents	4.22	3.89	3.19	71.44*
F-5		4.42	4.26	3.95	22.96*
P-6	Work, leisure, and citizenship	3.93	3.57	2.76	72.45*
F-6		4.07	4.02	3.48	28.66*
P-7	Discover interests and aptitudes	3.87	3.91	3.24	25.92*
F-7		4.12	4.19	3.57	22.76*
P-8	Changes in materials, industrial processes,	3.71	3.54	3.00	28.03*
F-8	and products	4.25	4.11	3.76	15.24*
P-9	Good workmanship and design	4.46	4.14	3.57	59.32*
F-9		4.52	4.30	3.81	53.81*
P-10	Evolution and relationships of society	2.79	2.98	2.33	20.80*
F-10	and technical means	3.28	3.48	2.76	24.39*
P-11	Educational and occupational choices	3.91	3.85	3.43	11.19*
F-11		4.06	4.41	4.19	11.96*
P-12	Leisure time interests	3.51	3.48	2.86	25.36*
F-12		3.66	3.59	3.19	10.61*
P-13	Integration of educational studies	3.51	3.53	3.19	5.48*
F-13		4.02	3.92	3.57	15.59*

Table 22 (continued)

P-14	Vocational training	3.87	4.02	3.33	21.45*
F-14		4.18	4.20	4.05	1.33
P-15	Nature and characteristic of technology	3.32	3.25	2.71	24.02*
F-15		3.81	3.78	3.19	32.27*
P-16	Technical skill and knowledge	3.96	3.57	3.24	34.74*
F-16		4.16	3.90	3.57	25.65*
P-17	Beliefs and values based on the impact	3.06	3.07	2.48	18.88*
F-17	of technology	3.67	3.71	3.14	19.56*
P-18	Tools, techniques, and resources of	4.26	4.12	3.52	37.49*
F-18	industry/technology	4.43	4.37	4.00	15.59*
P-19	Problem-solving skills	4.04	3.82	3.43	20.36*
F-19		4.48	4.35	4.05	15.75*
P-20	Consumer knowledge	3.78	3.76	2.81	49.53*
F-20		4.06	4.06	3.42	27.31*
P-21	Insight into industry	3.30	3.21	2.57	32.11*
F-21		3.76	3.65	3.00	36.82*
P-22	Understanding of technical culture	3.01	3.08	2.52	16.25*
F-22		3.50	3.55	3.05	15.41*
P-23	Prevocational experiences	3.49	3.62	2.86	21.42*
F-23		3.81	3.93	3.71	2.01

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal; P = present perspective; F = future perspective. Key (Likert scale) was used to calculate means.
$F(2,794) = 3.00$, $*p < .05$.

Table 23

Weighted Group Means and F Ratios by Position in Large Schools and by Present and Future Perspective

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Position I.A. Teach. Mean	Position School Princ. Mean	Position S.B. Pres. Mean	F Ratio
P-1	Handyman activities	3.41	3.30	3.00	0.98
F-1		3.68	3.49	3.23	1.67
P-2	Solution to societal problems	3.21	2.86	3.46	3.40*
F-2		4.05	3.97	4.00	0.16
P-3	Application of science and math	3.43	3.18	3.62	1.96
F-3		4.17	3.99	3.92	1.26
P-4	Habits of health and safety	4.82	4.85	3.92	19.59*
F-4		4.81	4.63	3.92	9.46*
P-5	Develop technical talents	3.79	3.39	3.92	3.78*
F-5		4.18	4.08	4.23	0.31
P-6	Work, leisure, and citizenship	3.54	3.32	3.15	1.51
F-6		3.99	4.23	3.69	2.07
P-7	Discover interests and aptitudes	3.72	3.59	3.15	1.92
F-7		4.05	4.04	3.77	0.52
P-8	Changes in materials, industrial processes,	3.39	3.15	3.08	1.45
F-8	and products	4.13	4.16	3.38	3.83*
P-9	Good workmanship and design	4.53	4.06	3.85	12.17*
F-9		4.52	4.31	3.85	4.85*
P-10	Evolution and relationships of society	2.79	2.68	2.69	0.30
F-10	and technical means	3.57	3.69	3.15	1.13
P-11	Educational and occupational choices	3.65	3.42	3.69	1.30
F-11		4.29	3.99	3.69	4.06*
P-12	Leisure time interests	3.46	3.60	3.08	1.53
F-12		3.53	3.99	3.77	5.25*
P-13	Integration of educational studies	3.12	3.08	3.38	0.37
F-13		3.78	3.95	3.54	0.71

Table 23 (continued)

P-14	Vocational training	3.30	3.60	3.38	1.48
F-14		3.73	3.80	3.46	0.35
P-15	Nature and characteristic of technology	3.22	3.00	2.92	1.46
F-15		4.07	4.11	3.31	3.81*
P-16	Technical skill and knowledge	3.70	3.38	3.31	3.68*
F-16		4.01	3.88	3.38	2.69
P-17	Beliefs and values based on the impact	2.77	2.72	2.46	0.54
F-17	of technology	3.56	3.95	2.85	5.49*
P-18	Tools, techniques, and resources of	4.22	3.94	3.46	5.89*
F-18	industry/technology	4.28	4.31	3.46	5.68*
P-19	Problem-solving skills	3.99	3.29	3.46	11.02*
F-19		4.42	4.22	3.85	3.20*
P-20	Consumer knowledge	3.58	3.25	2.85	4.30*
F-20		4.02	3.88	2.92	7.24*
P-21	Insight into industry	3.44	2.96	3.00	5.46*
F-21		3.87	3.83	2.92	5.04*
P-22	Understanding of technical culture	3.08	2.80	2.77	2.09
F-22		3.65	3.92	2.77	6.88*
P-23	Prevocational experiences	3.53	3.39	3.39	0.36
F-23		3.76	3.75	3.46	0.37

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal; P = present perspective; F = future perspective. Key (Likert scale) was used to calculate means.
$F(2,289) = 3.00$, $*p < .05$.

analysis of variance for research question two can be found in Appendix D, Table D-2.

Research Question 3

Were there differences between school principals and industrial arts teachers of junior high schools compared with senior high schools

regarding their perception of present and future program goals of industrial arts as measured by a oneway analysis of variance?

Table 24 (junior high schools) and Table 25 (senior high schools) display a brief description of the program goals, the calculated F ratio values, and an indication of significance upon the oneway analysis of variance. Ratings from present and future perspectives are displayed in the same table for reading convenience only. For example, the first entry in Table 24 (0.14) indicates that there was no significant difference in the mean ratings of the various groups concerning item 1 as perceived in the present program. An example of the typical oneway analysis of variance for research question 3 can be found in Appendix D, Table D-3. Industrial arts teachers and principals of junior high schools differed significantly on five (22%) of the program goals as perceived from their present program perspective (see Table 24). They were represented by items 4, 9, 19, 20, and 21 concerning traditional concepts such as safety, workmanship, problem solving, consumer knowledge, and insight into industry. Teachers rated these goals higher than principals. With these exceptions, there is general agreement on the importance of present program goals at the junior high level.

Senior high industrial arts teachers and principals, however, reported ratings of significant difference on 12 program goals (52%) as observed in their present program (see Table 25). The differences occurred on items 1, 2, 3, 4, 5, 6, 9, 10, 14, 16, 18, and 19 which addressed primarily traditional goals such as handyman activities, safety, talents, leisure, workmanship, use of tools, and vocational education. These were generally rated higher by teachers and lower by

principals in the senior high schools. The contemporary goals that were rated significantly different addressed concepts such as solution to social problems, evolution and relationship of society, and technical means.

A similar observation occurred when the respondents rated program goals as perceived in their future programs. Junior high principals and teachers reported significant differences on three (13%) of the program goals (see Table 24). The differences were noted on items 4, 9, and 20 referring to traditional goals of safety, workmanship, and consumer knowledge. These goals were all rated higher by teachers than by principals. With these exceptions, respondents at the junior high level appeared to be in substantial agreement on the future program goals of industrial arts.

The respondents' counterparts in the senior high rated 10 (43%) of the program goals differently at the .05 level of significance. Items of difference were 1, 2, 3, 4, 5, 9, 10, 11, 16, and 17 and addressed goals pertaining to handyman activities, safety, talents, educational/occupational choices, leisure, workmanship, skill, application of science and math (rated higher by teachers); and solutions to social problems, evolution and relationships of society, and beliefs and values based on technology (rated high by principals). Moderate differences were apparent between principals and teachers concerning contemporary and traditional goals at the senior high level.

Research Question 4

Were there differences due to industrial arts teachers' membership in professional organizations (state and national) relative to the

Table 24

Weighted Group Means and F Ratios by Position in Junior High Schools and by Present and Future Perspective

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Position I.A. Teach. Mean	Position School Princ. Mean	F Ratio
P-1	Handyman activities	3.32	3.25	0.14
F-1		3.74	3.49	2.55
P-2	Solution to societal problems	2.98	2.66	3.16
F-2		3.94	3.78	0.81
P-3	Application of science and math	3.36	3.06	2.60
F-3		4.01	3.80	1.59
P-4	Habits of health and safety	4.82	4.43	7.67*
F-4		4.91	4.61	8.91*
P-5	Develop technical talents	3.71	3.42	2.99
F-5		4.13	4.06	0.27
P-6	Work, leisure, and citizenship	3.53	3.34	1.16
F-6		4.10	4.16	0.16
P-7	Discover interests and aptitudes	3.88	3.72	0.73
F-7		4.12	4.17	0.11
P-8	Changes in materials, industrial processes,	3.36	3.11	1.68
F-8	and products	4.27	4.01	3.18
P-9	Good workmanship and design	4.46	3.92	13.36*
F-9		4.47	4.19	4.48*
P-10	Evolution and relationships of society	2.71	2.65	0.10
F-10	and technical means	3.60	3.53	0.16
P-11	Educational and occupational choices	3.50	3.30	1.03
F-11		4.19	3.89	2.95
P-12	Leisure time interests	3.73	3.59	0.69
F-12		3.77	3.96	1.43
P-13	Integration of educational studies	3.13	3.28	0.59
F-13		3.71	3.91	1.37

Table 24 (continued)

P-14	Vocational training	2.99	3.34	2.76
F-14		3.36	3.55	0.80
P-15	Nature and characteristic of technology	3.05	3.04	0.00
F-15		4.00	3.95	0.09
P-16	Technical skill and knowledge	3.49	3.38	0.41
F-16		3.86	3.72	0.84
P-17	Beliefs and values based on the impact	2.66	2.67	0.01
F-17	of technology	3.72	3.67	0.10
P-18	Tools, techniques, and resources of	4.07	3.88	1.20
F-18	industry/technology	4.32	4.23	0.45
P-19	Problem-solving skills	3.67	3.19	6.57*
F-19		4.32	4.04	3.36
P-20	Consumer knowledge	3.60	3.11	6.36*
F-20		4.16	3.69	9.13*
P-21	Insight into industry	3.36	2.88	7.45*
F-21		3.97	3.72	2.98
P-22	Understanding of technical culture	2.90	2.85	0.10
F-22		3.79	3.72	0.15
P-23	Prevocational experiences	3.05	2.95	0.22
F-23		3.40	3.29	0.26

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal; P = present perspective; F = future perspective. Key (Likert scale) was used to calculate means.
$F(1,160) = 3.84$, $*p < .05$.

Table 25

Weighted Group Means and F Ratios by Position in Senior High Schools and by Present and Future Perspective

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Position: I.A. Teach. Mean	Position: School Princ. Mean	F Ratio
P-1	Handyman activities	3.65	3.37	13.05*
F-1		3.86	3.56	16.85*
P-2	Solution to societal problems	3.28	3.09	6.29*
F-2		3.93	3.71	9.88*
P-3	Application of science and math	3.52	3.34	6.75*
F-3		4.21	3.85	33.63*
P-4	Habits of health and safety	4.82	4.50	59.50*
F-4		4.84	4.61	30.34*
P-5	Develop technical talents	4.13	3.87	16.80*
F-5		4.37	4.26	3.97*
P-6	Work, leisure, and citizenship	3.83	3.56	14.84*
F-6		4.02	4.03	0.02
P-7	Discover interests and aptitudes	3.80	3.88	1.18
F-7		4.09	4.16	1.02
P-8	Changes in materials, industrial processes,	3.64	3.54	1.86
F-8	and products	4.19	4.14	0.41
P-9	Good workmanship and design	4.49	4.16	42.34*
F-9		4.53	4.32	17.33*
P-10	Evolution and relationships of society	2.80	2.98	5.67*
F-10	and technical means	3.35	3.52	4.48*
P-11	Educational and occupational choices	3.88	3.87	0.02
F-11		4.15	4.43	16.92*
P-12	Leisure time interests	3.44	3.48	0.36
F-12		3.57	3.60	0.10
P-13	Integration of educational studies	3.41	3.48	0.70
F-13		3.98	3.92	0.74

Table 25 (continued)

P-14	Vocational training	3.80	4.06	14.52*
F-14		4.14	4.24	1.90
P-15	Nature and characteristic of technology	3.33	3.24	2.02
F-15		3.89	3.82	1.43
P-16	Technical skill and knowledge	3.94	3.57	36.42*
F-16		4.16	3.94	12.19*
P-17	Beliefs and values based on the impact	3.01	3.08	0.87
F-17	of technology	3.61	3.77	4.50*
P-18	Tools, techniques, and resources of	4.29	4.13	8.24*
F-18	industry/technology	4.38	4.38	0.00
P-19	Problem-solving skills	4.10	3.83	15.42*
F-19		4.49	4.38	3.45
P-20	Consumer knowledge	3.73	3.78	0.50
F-20		4.02	4.09	1.22
P-21	Insight into industry	3.35	3.22	3.61
F-21		3.77	3.67	1.72
P-22	Understanding of technical culture	3.07	3.06	0.00
F-22		3.51	3.59	1.20
P-23	Prevocational experiences	3.60	3.71	1.57
F-23		3.88	4.02	2.89

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal; P = present perspective; F = future perspective; Key (Likert scale) was used to calculate means.
$F(1,764) = 3.84$; *$p < .05$.

importance of present and future program goals as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

Section II of the questionnaire, items 6 and 7, asked respondents to report membership in state and national (respectively) professional

organizations. Table 26 indicates that 50% of the industrial arts teachers in the State of Nebraska did not hold membership in any state professional organizations for industrial arts. Table 27 indicates that 62% of the industrial arts teachers were not members of any national professional organizations for industrial arts.

Table 26

Number and Percentage of Memberships in State Professional Organizations for Industrial Arts

Organization	f	cf	%	c%
None	269	269	50.0	50.0
N.I.T.E.A.	264	533	49.1	99.1
N.V.A.	17	550	03.2	102.3
other	36	586	06.7	109.0*
nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency of memberships; % = percent; c% = cumulative percent; -- = inapplicable. N.I.T.E.A. = Nebraska Industrial Technology Education Association; N.V.A. = Nebraska Vocational Association. * = due to multiple memberships, total is more than 100.

It must be noted that due to respondents being allowed more than one response for this item, percentages were calculated on frequency of memberships held, not by frequency of industrial arts teachers. Table 27 presents the number and percentage of memberships in national professional organizations. Again, due to respondents being allowed

more than one response for this item, percentages were calculated on frequency of memberships held.

Table 27

Number and Percentage of Memberships in National Professional Organizations for Industrial Arts

Organization	f	cf	%	c%
None	336	336	62.5	62.5
I.T.E.A.	162	498	30.1	92.6
A.V.A.	43	541	08.0	100.6
E.P.T.	49	590	09.1	109.7
other	24	614	04.5	114.2*
nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency of memberships; % = percent; c% = cumulative percent; -- = inapplicable. I.T.E.A. = International Technology Education Association; A.V.A. = American Vocational Association; E.P.T. = Epsilon Pi Tau. * = due to multiple memberships, total is more than 100.

It was of interest to observe if membership in professional organizations was associated with respondents' ratings of the goal statements. It was theorized that nonmembers of professional organizations would not be abreast of the major directions of the profession, and as a result, rate program goals differently. Table 28 presents the statistical analysis performed on each of the ratings of the 23 goal statements with members and nonmembers of state professional

organizations. The identical procedure was repeated substituting members and nonmembers of national professional organizations. For all Chi-square tests, the five-point Likert scale was collapsed to two nominal levels ("high" rating, "low" rating) in an effort to increase frequency count in cells of the contingency table for more meaningful statistical analysis. A Likert rating of "3" was eliminated from the analysis. Research question 4 crosstabulated these ratings with the variables of "member" and "nonmember," and as a result, duplicate memberships were counted only once.

It must be noted that the variables of (a) state and national, and (b) present and future were presented for convenience in comparison only. No statistical calculations were made between state and national membership or present and future perspective. For example, the first entry in Table 28 (0.64) indicates that there was no significant difference between members and nonmembers of state organizations when rating item 1 from present perspective. An example of the typical crosstabulation and the Chi-square statistic for this table is found in Appendix D, Table D-4. The Chi-square test was employed to determine if significant differences occurred.

Table 28 indicates that when members and nonmembers of state professional organizations were compared, significant differences were observed relative to 10 of the 23 (43%) goal statements from the present perspective. These goals were represented by items 2, 5, 6, 11, 12, 13, 14, 16, 19, and 22. With the exception of items 2, 16, and 22, these goals were traditional in nature and nonmembers rated them consistently more important than members. Five (21%) significant differences were

observed relative to the 23 goal statements from a future perspective. They were items 2, 7, 12, 14, and 21. Again, members rated the contemporary goal (item 2) higher, while the traditional goals were rated higher by nonmembers.

When members and nonmembers of national professional organizations were compared, 8 (35%) of the 23 goal statements from the present perspective yielded significant differences (items 3, 6, 7, 8, 11, 12, 13, and 14). With one exception, traditional goals were rated higher by nonmembers. The exception, item 11, concerning educational choices, was rated higher by members. Nine (39%) of the 23 goal statements from the future perspective yielded significant differences (items 1, 2, 3, 7, 8, 10, 12, 13, and 15). Six of these goals were considered contemporary, dealing with technology and society, and were rated higher by members. The remainder were traditional in nature (handyman activities, leisure, etc.) and were rated higher by nonmembers.

Research Question 5

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to source of bachelors degree as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

As cited in the literature review, teacher educators have an impact on the way teachers teach (Guyton, 1984). Therefore, it was of interest to observe if differences in program goal ratings, by industrial arts teachers, occurred due to the source of their bachelors degree.

Table 28

A Comparison of Chi-square Values Upon Crosstabulation between Members and Nonmembers of State and National Professional Organizations for Industrial Arts

Item No.	Program Goal	State		National	
		Present	Future	Present	Future
1.	Handyman activities	0.64	0.00	0.72	4.82*
2.	Solution to societal problems	7.52*	38.55*	1.97	5.80*
3.	Application of science and math	1.03	2.37	4.96*	8.63*
4.	Habits of health and safety	3.40	1.44	0.10	0.50
5.	Develop technical talents	6.24*	0.16	0.53	1.61
6.	Work, leisure, and citizenship	33.94*	1.94	8.15*	0.27
7.	Discover interests and aptitudes	0.47	12.16*	21.86*	8.61*
8.	Changes in materials, industrial processes, and products	0.11	0.08	8.11*	5.14*
9.	Good workmanship and design	1.01	1.58	1.69	0.51
10.	Evolution and relationships of society and technical means	3.09	0.66	0.53	12.96*
11.	Educational and occupational choices	4.45*	2.12	7.83*	0.23
12.	Leisure time interests	9.27*	7.65*	10.74*	8.66*
13.	Integration of educational studies	5.83*	1.97	11.09*	10.49*
14.	Vocational training	10.94*	14.46*	10.36*	2.99
15.	Nature and characteristics of technology	1.94	1.81	3.04	11.00*
16.	Technical skill and knowledge	4.56*	0.29	2.65	0.03
17.	Beliefs and values based on the impact of technology	1.44	0.15	0.16	0.99

Table 28 (continued)

18.	Tools, techniques, and resources of industry/technology	0.11	0.00	0.79	1.46
19.	Problem-solving skills	13.92*	0.50	0.73	2.80
20.	Consumer knowledge	3.63	0.00	2.17	0.04
21.	Insight into industry	0.66	5.71*	0.16	0.71
22.	Understanding of technical culture	7.48*	0.28	3.57	1.28
23.	Prevocational experiences	1.04	1.13	2.19	0.31

Note. Present = present perspective; Future = future perspective. df = 1; Critical Value of Chi-square = 3.841; * = $p < .05$.

This information was solicited in Section II, item 8, of the questionnaire. Table 29 presents the number and percentage of industrial arts teachers who received their bachelors degree from various institutions in the state. The majority (27%) indicated receiving their bachelors degree from Kearney State. The remaining teachers were somewhat equally divided between Chadron State (10%), Peru State (15%), and Wayne State (17%). An additional 13% indicated that they received their degree out of state.

Table 30 summarizes the results of a crosstabulation of teachers, according to their various bachelor degree granting institutions, with the program goal ratings. For all Chi-square tests, the five-point Likert scale was collapsed to two nominal levels ("high" rating, "low" rating) in an effort to increase frequency count in cells of the contingency table for more meaningful statatical analysis. A Likert rating of "3" was eliminated from the analysis. This analysis employed the Chi-square test of independence. The results of this test are found

in Table 30. Significant differences were observed in 20 (87%) of the program goals from the present perspective (exceptions were items 4, 9, and 23 concerning safety, workmanship, and prevocational experiences). Twenty-two (96%) of the program goals from the future perspective (all except item 18 concerning tools and techniques) were rated significantly different by teachers according to source of bachelors degree. A close

Table 29

Number and Percentage of Industrial Arts Teachers Classified by Source of Bachelors Degree

Institution	f	cf	%	c%
Chadron State	54	54	10.1	10.1
Kearney State	147	201	27.3	37.4
Peru State	81	282	15.0	52.4
Wayne State	93	375	17.3	69.7
University of Nebraska	92	467	17.2	86.9
Out of state	71	538	13.1	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; -- = inapplicable.

appraisal of the data from the 46 crosstabulations indicated that out of state graduates consistently rated goals differently than graduates in state.

It must be noted that data in Table 30 do not attempt to statistically compare present and future perspective. Both perspectives

Table 30

A Comparison of Chi-square Values Upon Crosstabulation of Industrial Arts Teachers Based on Source of Bachelors Degree

Item No.	Program Goal	Present	Future
1.	Handyman activities	86.56*	165.34*
2.	Solution to societal problems.	15.89*	33.18*
3.	Application of science and math	22.41*	12.81*
4.	Habits of health and safety	5.16	13.39*
5.	Develop technical talents	12.15*	16.87*
6.	Work, leisure, and citizenship	11.09*	18.76*
7.	Discover interests and aptitudes	54.22*	52.60*
8.	Changes in materials, industrial processes, and products	25.66*	16.67*
9.	Good workmanship and design	7.99	14.08*
10.	Evolution and relationships of society and technical means	19.49*	18.66*
11.	Educational and occupational choices	32.17*	31.25*
12.	Leisure time interests	92.73*	110.61*
13.	Integration of educational studies	44.13*	20.14*
14.	Vocational training	32.99*	34.12*
15.	Nature and characteristics of technology	43.84*	25.70*
16.	Technical skill and knowledge	14.48*	18.19*
17.	Beliefs and values based on the impact of technology	17.54*	27.90*
18.	Tools, techniques, and resources of industry/technology	26.59*	6.93
19.	Problem-solving skills	12.82*	18.99*
20.	Consumer knowledge	55.63*	23.60*
21.	Insight into industry	59.47*	59.60*
22.	Understanding of technical culture	69.94*	43.36*
23.	Prevocational experiences	6.52	13.54*

Note. Present = present perspective; Future = future perspective. df = 5; Critical Value of Chi-square = 11.070; * = $p < .05$.

are included only for reading convenience. For example, the first entry in Table 30 (86.56*) indicates that there was a significant difference in teachers based on source of bachelors degree when rating item 1 from present program perspective. An example of the typical crosstabulation and Chi-square statistic is found in Appendix D, Table D-5.

Research Question 6 :

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to source of masters degree as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

It was also of interest to determine if the source of the masters degree (or the lack of one) significantly affected the program goal ratings reported by industrial arts teachers. It was theorized that teachers' goal ratings would be influenced by philosophical concepts acquired in graduate programs. Section II, item 9, of the questionnaire asked for this information. The identical procedures incorporated in research question 5 were followed. Fifty-eight percent of the industrial arts teachers in Nebraska did not possess the masters degree. The majority (36%) of the teachers with a masters degree received the degree from Kearney State. The University of Nebraska provided an additional 28%, while Wayne State and out of state institutions accounted for an additional 18% each. The cumulative number and percentage of teachers reporting the source of their masters degree is found in Table 31.

Table 32 summarizes the results obtained from the Chi-square analysis to determine if there was an association between program goal

ratings by teachers relative to masters degree. It must be noted that data in Table 32 do not attempt to statistically compare present and future perspective. Both perspectives are included only for reading convenience. For example, the first entry in Table 32 (30.84*) indicates that there was a significant difference in teachers based on source of masters degree when rating item 1 from present program perspective. An example of the typical crosstabulation and Chi-square statistic is found in Appendix D, Table D-6.

Table 31

Number and Percentage of Industrial Arts Teachers Classified by Source of Masters Degree

Institution	f	cf	%	c%
Chadron State	1	1	0.2	0.2
Kearney State	81	82	15.1	15.2
Wayne State	40	122	7.4	22.7
University of Nebraska	63	185	11.8	34.4
Out of state	40	225	7.4	41.99
None	313	538	58.0	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; — = inapplicable.

Source of masters degree was not significant in rating 10 (44%) of the program goal statements as perceived in the present program. Those goals were represented by items 4, 8, 9, 10, 11, 12, 13, 14, 15, and 23

Table 32

A Comparison of Chi-square Values Upon Crosstabulation of Industrial Arts Teachers Based on Source of Masters Degree

Item No.	Program Goal	Present	Future
1.	Handyman activities	30.84*	86.64*
2.	Solution to societal problems	22.78*	51.37*
3.	Application of science and math	23.15*	20.53*
4.	Habits of health and safety	8.72	33.57*
5.	Develop technical talents	18.51*	23.32*
6.	Work, leisure, and citizenship	61.23*	20.70*
7.	Discover interests and aptitudes	15.54*	47.15*
8.	Changes in materials, industrial processes, and products	7.26	11.00
9.	Good workmanship and design	0.76	52.92*
10.	Evolution and relationships of society and technical means	9.35	10.41
11.	Educational and occupational choices	3.56	18.15*
12.	Leisure time interests.	4.24	15.36*
13.	Integration of educational studies	8.47	37.63*
14.	Vocational training	7.85	25.87*
15.	Nature and characteristics of technology	10.99	26.67*
16.	Technical skill and knowledge	50.97*	133.49*
17.	Beliefs and values based on the impact of technology	17.90*	15.31*
18.	Tools, techniques, and resources of industry/technology	37.53*	28.74*
19.	Problem-solving skills	57.19*	37.28*
20.	Consumer knowledge	39.20*	12.21*
21.	Insight into industry	44.54*	27.55*
22.	Understanding of technical culture	22.83*	29.35*
23.	Prevocational experiences	5.74	16.84*

Note. Present = present perspective; Future = future perspective. df = 5; Critical Value of Chi-square = 11.074; * = $p < .05$.

and addressed traditional goals such as safety, vocational training and experience, leisure, and workmanship, and contemporary goals such as those concerning technology and society. From future perspective, only items 8 and 10 were not rated significantly different. These concerned materials and processes, and evolution of society and technical means.

Research Question 7

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to class load as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

Section II, item 1, asked teachers to report the number of periods taught per day in the respective grades, 7 through 12. A frequency distribution was calculated using three intervals, namely, one to three periods, four to six periods, and seven or more. The majority (63%) of respondents reported teaching four to six periods per day. An additional 34% indicated teaching seven or more periods per day. Only 4% reported teaching less than four periods per day. Table 33 displays the number and percentage cumulatively.

When the variables of teachers' class load and program goal ratings were statistically analyzed (see Table 34), 14 of the program goals (57%) from the present perspective were rated significantly different. These 14 goals were represented by item numbers 1, 4, 5, 6, 7, 8, 9, 10, 12, 16, 18, 19, 22, and 23, and concerned a variety of traditional and contemporary goals.

Fifteen program goals (65%) from the future perspective were rated significantly different. These goals were represented by items 1, 3, 4,

5, 6, 7, 8, 9, 12, 13, 14, 18, 19, 20, and 23. With few exceptions, they were the same goals statistically selected using the present perspective.

Table 33

Number and Percentage of Industrial Arts Teachers Classified by Number of Periods Taught Per Day

Class Load	f	cf	%	c%
1 to 3 periods day	21	21	3.9	3.9
4 to 6 periods day	333	354	61.9	65.8
7 or more period per day	184	538	34.2	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; -- = inapplicable.

It must again be noted that data in Table 34 do not attempt to statistically compare present and future perspective. Both perspectives are included only for reading convenience. For example, the first entry in Table 34 (20.32*) indicates that there was a significant difference in teachers based on class load when rating item 1 from present program perspective. An example of the typical crosstabulation and Chi-square statistic is found in Appendix D, Table D-7.

Table 34

A Comparison of Chi-square Values Upon Crosstabulation of Industrial Arts Teachers Based on Class Load

Item No.	Program Goal	Present	Future
1.	Handyman activities	20.32*	70.07*
2.	Solution to societal problems	1.10	3.65
3.	Application of science and math	1.25	15.07*
4.	Habits of health and safety	24.67*	27.66*
5.	Develop technical talents	17.73*	10.34*
6.	Work, leisure, and citizenship	28.87*	18.15*
7.	Discover interests and aptitudes	30.64*	20.85*
8.	Changes in materials, industrial processes, and products	11.18*	16.53*
9.	Good workmanship and design	30.52*	36.27*
10.	Evolution and relationships of society and technical means	18.54*	2.77
11.	Educational and occupational choices	5.55	4.60
12.	Leisure time interests	26.15*	10.78*
13.	Integration of educational studies	0.14	8.80*
14.	Vocational training	2.05	23.61*
15.	Nature and characteristics of technology	5.71	2.72
16.	Technical skill and knowledge	20.73*	2.71
17.	Beliefs and values based on the impact of technology	2.64	0.96
18.	Tools, techniques, and resources of industry/technology	10.43*	18.85*
19.	Problem-solving skills	20.64*	15.50*
20.	Consumer knowledge	3.14	11.44*
21.	Insight into industry	5.14	1.21
22.	Understanding of technical culture	8.75*	1.88
23.	Prevocational experiences	13.38*	19.75*

Note. Present = present perspective; Future = future perspective. df = 2; Critical Value of Chi-square = 5.991; * = $p < .05$.

Research Question 8

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to level of

education as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

The attainment of education beyond the minimal bachelors degree was of interest in determining if those industrial arts teachers with various levels of additional education rated the program goal statements differently. Section II, item 2, requested respondents to indicate their level of education according to intervals of (a) bachelors, (b) masters, (c) masters plus 30 additional hours, (d) educational specialist, and (e) doctorate.

The majority of the teachers (57%) indicated they had not completed any formal degree beyond the bachelors degree. 143 teachers (27%) possessed the masters degree while an additional 14% had completed 30 hours beyond the masters degree. Three and one-half percent reported completion of the educational specialist degree while the attainment of the doctorate degree was indicated by none. Table 35 displays the cumulative number and percentages of industrial arts teachers and their respective level of educational attainment.

Table 36 summarizes the results of the Chi-square statistical analysis to determine if there was an association between program goals and varying levels of educational attainment. Sixteen of the 23 goal statements (70%) from the present perspective were rated statistically different. They were items 1, 2, 4, 5, 6, 7, 10, 12, 13, 14, 15, 16, 17, 18, 19, and 23 which addressed a variety of traditional and contemporary goals. When differences occurred, it appeared that those with less education rated traditional goals higher and contemporary goals lower. Sixteen (70%) goals (items 1, 4, 5, 6, 7, 9, 11, 12, 13,

14, 16, 18, 19, 20, 22, and 23) were also found to be significantly different relative to teachers' educational attainment when rated from the future perspective.

Table 35

Number and Percentage of Industrial Arts Teachers at Various Levels of Educational Attainment

Educational Level Attained	f	cf	%	c%
Bachelors	304	304	56.5	56.5
Masters	143	447	26.5	83.0
Masters Plus 30 Hours	73	520	13.5	96.5
Educational Specialist	19	539	3.5	100.0
Doctorate	0	539	0.0	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; -- = inapplicable.

It must be noted that data in Table 36 do not attempt to statistically compare present and future perspective. Both perspectives are included only for reading convenience. For example, the first entry in Table 36 (54.65*) indicates that there was a significant difference in teachers based on educational attainment when rating item 1 from present program perspective. An example of the typical crosstabulation and Chi-square statistic is found in Appendix D, Table D-8.

Table 36

A Comparison of Chi-square Values Upon Crosstabulation of Industrial Arts Teachers Relative to Educational Attainment

Item No.	Program Goal	Present	Future
1.	Handyman activities	54.65*	64.88*
2.	Solution to societal problems	14.60*	5.96
3.	Application of science and math	5.27	4.69
4.	Habits of health and safety	10.04*	17.24*
5.	Develop technical talents	12.17*	10.25*
6.	Work, leisure, and citizenship	68.36*	42.20*
7.	Discover interests and aptitudes	10.78*	14.46*
8.	Changes in materials, industrial processes, and products	3.95	6.04
9.	Good workmanship and design	0.82	15.93*
10.	Evolution and relationships of society and technical means	10.97*	7.33
11.	Educational and occupational choices	4.60	20.59*
12.	Leisure time interests	21.66*	19.47*
13.	Integration of educational studies	8.95*	15.10*
14.	Vocational training	8.61*	14.50*
15.	Nature and characteristics of technology	9.05*	1.63
16.	Technical skill and knowledge	21.44*	46.28*
17.	Beliefs and values based on the impact of technology	27.00*	6.61
18.	Tools, techniques, and resources of industry/technology	10.58*	30.01*
19.	Problem-solving skills	44.64*	44.45*
20.	Consumer knowledge	5.23	13.06*
21.	Insight into industry	3.78	1.56
22.	Understanding of technical culture	7.06	16.53*
23.	Prevocational experiences	15.58*	14.26*

Note. Present = present perspective; Future = future perspective. df = 3; Critical Value of Chi-square = 7.815; * = $p < .05$.

Research Question 9

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to number of years

of industrial arts teaching experience as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

Section II, item 3, asked respondents to indicate the number of years of teaching experience in industrial arts, grades 7 through 12. These data were solicited in an effort to observe differences in program goal ratings relative to teaching experience. The majority of the industrial arts teachers responding (39%) indicated 15 years or more of teaching experience in industrial arts at the secondary level. Twenty-three percent of the respondents reported 10 to 14 years of experience. Industrial arts teachers with five to nine years of experience represented 19% of the population and those with zero to four years of experience were equally represented (19%). Table 37 displays the cumulative number and percentage of industrial arts teachers at various experience intervals.

When subjected to the Chi-square test, number of years of teaching experience by respondents with present perception of goals made a statistically significant difference, at the .05 level, relative to rating 16 (70%) of the program goals (see Table 38). These goals were items numbered 2, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 23. The traditional goals of safety and workmanship were agreed upon from both perspectives. When respondents ratings were compared to teaching experience, program goals from the future perspective indicated significant differences on 14 (61%) program goals. These goals were represented by items 2, 3, 5, 6, 7, 10, 11, 13, 14, 16, 18, 20, 21, and 23 and addressed a variety of contemporary and traditional goals.

Table 37

Number and Percentage of Industrial Arts Teachers Classified by Years of Teaching Experience in Grades Seven through Twelve

Years of Experience	f	cf	%	c%
0 - 4 years	103	103	19.1	19.3
5 - 9 years	100	203	18.6	37.7
10- 14 years	126	329	23.4	61.1
15 years or more	209	538	38.9	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; -- = inapplicable.

It must be noted that data in Table 38 do not attempt to statistically compare present and future perspective. Both perspectives are included only for reading convenience. For example, the first entry in Table 38 (0.65) indicates that there was no significant difference between teachers based on years of experience when rating item 1 from present program perspective. An example of the typical crosstabulation and Chi-square statistic is found in Appendix D, Table D-9.

Research Question 10

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to their age as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

Table 38

A Comparison of Chi-square Values Upon Crosstabulation of Industrial Arts Teachers Relative to Years of Experience

Item No.	Program Goal	Present	Future
1.	Handyman activities	0.65	0.51
2.	Solution to societal problems	78.30*	40.41*
3.	Application of science and math	4.98	16.23*
4.	Habits of health and safety	5.39	7.35
5.	Develop technical talents	6.26	13.38*
6.	Work, leisure, and citizenship	2.31	9.32*
7.	Discover interests and aptitudes	8.06*	12.83*
8.	Changes in materials, industrial processes, and products	26.31*	0.76
9.	Good workmanship and design	1.51	7.20
10.	Evolution and relationships of society and technical means	50.13*	68.87*
11.	Educational and occupational choices	14.57*	18.21*
12.	Leisure time interests	20.36*	3.13
13.	Integration of educational studies	26.52*	9.13*
14.	Vocational training	18.40*	66.66*
15.	Nature and characteristics of technology	9.00*	7.51
16.	Technical skill and knowledge	13.71*	29.34*
17.	Beliefs and values based on the impact of technology	40.80*	6.91
18.	Tools, techniques, and resources of industry/technology	33.36*	12.39*
19.	Problem-solving skills	8.94*	6.20
20.	Consumer knowledge	29.71*	17.83*
21.	Insight into industry	18.37*	15.42*
22.	Understanding of technical culture	3.53	0.92
23.	Prevocational experiences	30.12*	16.84*

Note. Present = present perspective; Future = future perspective. df = 3; Critical Value of Chi-square = 7.815; * = $p < .05$.

Section II, item 7, asked respondents to report their age in years according to ten-year intervals. The majority of industrial arts teachers (44.1%) indicated their age to be between 31 and 40 years. Teachers between 21 and 30 years of age, and those between 41 and 50

years of age, were similarly represented at 20.8% and 21.7%, respectively. The least represented was the category for those indicating their age to be between 51-60 years. None of the respondents indicated their age to be over 60 years. Table 39 represents the cumulative number and percentage of industrial arts teachers relative to age by ten-year intervals.

Table 40 summarizes the results of the Chi-square analysis to determine if there was an association between program goals and age. When the Chi-square test was applied to the perception of present program goals with the age in years variable, all except eight goals (34.8%) were statistically significant. These exceptions are represented by items 2, 4, 5, 6, 7, 9, 11, and 16. There appeared to be general agreement on the traditional goals of industrial arts with the exception of vocational training and handyman activities. Both were rated higher by the oldest and youngest age groups.

When the identical procedures were applied to the program goal ratings from a future perspective, all except four (17.4%) of the goals were rated statistically significant. The exceptions in this case were items numbered 8, 12, 13, and 23. There appeared to be agreement on the goals concerning vocational education, integration of education, and leisure interests.

In Table 40, it must be noted that the data do not attempt to statistically compare present and future perspective. Both perspectives are included only for reading convenience. For example, the first entry in Table 40 (19.41*) indicates that there was a statistically significant difference in teachers based on age when rating item 1 from

present program perspective. An example of the typical crosstabulation and the Chi-square statistic is found in Appendix D, Table D-10.

Table 39

Number and Percentage of Industrial Arts Teachers by Age

Age in Years	f	cf	%	c%
21 - 30 years	112	112	20.8	20.8
31 - 40 years	237	349	44.1	64.9
41 - 50 years	117	466	21.7	86.5
51 - 60 years	72	538	13.5	100.0
Over 60 years	0	538	0.0	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; -- = inapplicable.

Research Question 11

Were there differences among industrial arts teachers on their perceptions of present and future program goals due to status of teacher certification as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

Industrial arts teachers were asked to report their status of teacher certification. Section II, item 4, of the questionnaire solicited this data. The majority (96.0%) of the industrial arts teachers reported they were fully certified to teach industrial arts in

Table 40

A Comparison of Chi-square Values Upon Crosstabulation of Industrial Arts Teachers Relative to Age in Years

Item No.	Program Goal	Present	Future
1.	Handyman activities	19.41*	32.19*
2.	Solution to societal problems	0.37	25.19*
3.	Application of science and math	8.56*	15.35*
4.	Habits of health and safety	4.65	16.75*
5.	Develop technical talents	0.54	11.61*
6.	Work, leisure, and citizenship	1.12	12.03*
7.	Discover interests and aptitudes	4.15	8.29*
8.	Changes in materials, industrial processes, and products	11.21*	5.57
9.	Good workmanship and design	1.36	16.20*
10.	Evolution and relationships of society and technical means	38.09*	32.15*
11.	Educational and occupational choices	5.84	20.39*
12.	Leisure time interests	11.37*	4.41
13.	Integration of educational studies	35.44*	0.50
14.	Vocational training	17.68*	36.75*
15.	Nature and characteristics of technology	10.58*	7.97*
16.	Technical skill and knowledge	6.09	17.28*
17.	Beliefs and values based on the impact of technology	16.39*	9.11*
18.	Tools, techniques, and resources of industry/technology	10.20*	8.84*
19.	Problem-solving skills	15.90*	22.05*
20.	Consumer knowledge	21.46*	35.99*
21.	Insight into industry	11.84*	11.89*
22.	Understanding of technical culture	18.80*	11.51*
23.	Prevocational experiences	18.71*	6.73

Note. Present = present perspective; Future = future perspective. df = 3; Critical Value of Chi-square = 7.815; * = $p < .05$.

the State of Nebraska. Thirteen teachers (2.3%) reported being provisionally certified while the remaining 1.7% indicated they were not certified to teach industrial arts in the state. Table 41 displays the cumulative number and percentage of industrial arts teachers classified

by teaching certification status. Due to the relatively few number of cases that were represented in the "provisionally certified" and "not certified" cells of the crosstabulation, the Chi-square test was not applied.

Table 41

Number and Percentage of Industrial Arts Teachers Classified by Status of Teacher Certification

Certification Status	f	cf	%	c%
Fully Certified	516	516	96.0	96.0
Provisionally Certified	13	529	2.3	98.3
Not Certified	9	538	1.7	100.0
Nonrespondents	--	--		

Note. f = frequency; cf = cumulative frequency; % = percent; c% = cumulative percent; -- = inapplicable.

Research Question 12

Will there be differences between respondents' perceptions of program goals due to perspective (present/future) as measured by a matched pairs t-test (correlated t)?

Research Question 12 attempted to determine if industrial arts teachers, school principals, school board presidents, or industrial arts teacher educators, reported a statistically significant difference in their perception of the 23 program goal statements relative to their

present programs as compared to their perception of the goal statements relative to their programs in the future. The matched pairs t-test (two-tailed) was selected as the appropriate statistical test. In an effort to observe differences between school size and teaching level, group means (as determined by the 5-point Likert scale rating) and the associated value of t were reported.

Table 42 displays (a) the group means for each of the 23 goal statements from both perspectives, present and future, (b) the calculated value of t, and (c) an indication of the significance of the t-test at the .05 level. For ease of comparison, Table 42 simultaneously presents this information for all strata of industrial arts teachers. It should be noted there were no statistical calculations between subgroups, only between present and future perspective. For example, the first entry in Table 43 (2.53*) indicates that industrial arts teachers in large junior high schools rated item 1 significantly higher for future program application. An example of the typical t-test as utilized in research question 12 is found in Appendix D, Table D-11.

Junior high teachers in large schools (enrollment exceeding 500) rated goal statements, relative to present or future perspective, significantly different on 19 of the 23 items. Those goals, a variety of contemporary and traditional, consisted of items 1, 2, 3, 5, 6, 7, 8, 10, 11, 13, 14, 15, 16, 17, 19, 20, 21, 22, and 23 and were all rated higher relative to their importance in a future program than to their present program. There was no significant difference, due to

perspective, in the high ratings assigned to safety, workmanship, use of tools, and leisure.

Senior high teachers in large schools rated the following 11 goals (mostly contemporary) significantly different relative to perspective for their present and future programs: items 2, 3, 5, 8, 10, 11, 13, 14, 15, 17, and 22. Similar to their junior high colleagues, senior high teachers rated these items higher relative to their future programs than in their present programs. It is interesting to note that this subgroup had a negative t value on items 4 and 18 (safety, and tool, techniques, and resource of industry) indicating that they rated these items somewhat lower in importance as they would apply to their programs in the future. However, the statistic was not significant at the .05 level.

Junior high industrial arts teachers in small schools (enrollment less than or equal to 500) rated 14 program goals significantly different in reference to present or future perspective. Those goals were items 2, 3, 5, 6, 8, 10, 11, 15, 17, 18, 19, 20, 21, and 22. The exceptions were those goals generally considered traditional in nature.

The final strata of industrial arts teachers, senior high teachers in small schools, indicated significant mean differences for 15 of the 23 program goal statements. Items 1, 2, 3, 7, 8, 10, 13, 14, 15, 17, 19, 20, 21, 22, and 23 were rated significantly different. Again, exceptions were those goals considered traditional in nature. All four subgroups (by strata) unanimously indicated significant differences on the same seven contemporary goal statements, those being items 2, 3, 8, 10, 15, 17, and 22.

Table 42

Mean Comparisons and Related t-Tests for Unweighted Subgroups of Industrial Arts Teachers

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Large Schools			Small Schools		
		Jr Hi Means	t Test	Sr Hi Means	t Test	Jr Hi Means	t Test	Sr Hi Means	t Test
P-1	Handyman activities	3.23	2.53*	3.51	0.92	3.7	1.67	3.71	2.10*
F-1		3.68		3.68		4.0		3.94	
P-2	Solution to societal problems	2.87	5.66*	3.41	4.05*	3.40	3.04*	3.24	4.87*
F-2		3.90		4.14		4.10		3.85	
P-3	Application of science and math	3.32	4.62*	3.51	3.11*	3.50	2.85*	3.53	4.68*
F-3		4.06		4.24		3.80		4.21	
P-4	Habits of health and safety	4.84	1.79	4.81	-0.57	4.75	1.06	4.82	0.81
F-4		4.94		4.73		4.80		4.88	
P-5	Develop technical talents	3.74	2.55*	3.81	2.66*	3.60	2.98*	4.26	1.79
F-5		4.13		4.26		4.15		4.44	
P-6	Work, leisure, and citizenship	3.48	3.81*	3.57	1.90	3.75	3.25*	3.94	1.16
F-6		4.06		3.95		4.25		4.06	
P-7	Discover interests and aptitudes	3.81	2.19*	3.68	2.02	4.15	0.57	3.85	3.45*
F-7		4.10		4.03		4.20		4.12	
P-8	Changes in materials, industrial processes, and products	3.54	5.08*	3.41	2.88*	3.40	2.60*	3.74	3.32*
F-8		4.35		4.00		3.95		4.26	
P-9	Good workmanship and design	4.52	-0.24	4.54	0.0	4.25	1.83	4.47	1.00
F-9		4.48		4.54		4.40		4.53	
P-10	Evolution and relationships of society and technical means	2.61	5.76*	2.89	3.55*	3.10	3.33*	2.76	3.89*
F-10		3.61		3.54		3.55		3.26	
P-11	Educational and occupational choices	3.51	3.99*	3.73	3.19*	3.45	2.77*	3.94	1.07
F-11		4.19		4.35		4.15		4.06	
P-12	Leisure time interests	3.74	0.00	3.30	0.57	3.70	1.29	3.50	1.54
F-12		3.74		3.41		3.90		3.65	

Table 42 (continued)

P-13	Integration of	2.97		3.22		3.75		3.50	
	educational studies		3.61*		3.05*		1.45		3.02*
F-13		3.65		3.86		3.95		4.03	
P-14	Vocational training	2.81		3.59		3.70		3.88	
			2.62*		2.07*		0.33		3.20*
F-14		3.26		4.00		3.75		4.21	
P-15	Nature and character-	3.00		3.35		3.25		3.32	
	istic of technology		5.85*		3.44*		3.20*		4.12*
F-15		4.10		4.05		3.60		3.82	
P-16	Technical skill	3.42		3.86		3.75		3.97	
	and knowledge		2.44*		1.20		1.71		2.08
F-16		3.84		4.11		3.95		4.18	
P-17	Beliefs and values	2.55		2.89		3.10		3.06	
	based on the impact		5.32*		3.02*		2.98*		4.62*
F-17	of technology	3.74		3.46		3.65		3.68	
P-18	Tools, techniques,	4.13		4.27		3.85		4.29	
	and resources of		1.13		-0.20		2.33*		1.54
F-18	industry/technology	4.35		4.24		4.20		4.44	
P-19	Problem-solving	3.65		4.19		3.75		4.06	
	skills		4.06*		1.30		2.93*		3.27*
F-19		4.35		4.46		4.20		4.50	
P-20	Consumer knowledge	3.61		3.57		3.55		3.79	
			3.26*		1.68		2.94*		2.05*
F-20		4.19		3.92		4.05		4.06	
P-21	Insight into	3.35		3.49		3.40		3.29	
	industry		3.26*		2.02		3.39*		3.90*
F-21		3.94		3.84		4.10		3.74	
P-22	Understanding of	2.84		3.22		3.15		3.00	
	technical culture		5.76*		2.09*		2.44*		3.70*
F-22		3.84		3.54		3.60		3.50	
P-23	Prevocational	3.00		3.84		3.25		3.50	
	experiences		2.16*		0.83		1.67		2.15*
F-23		3.35		4.00		3.55		3.82	

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal. Key (Likert scale) was used to calculate means. Group designation: Jr Hi = Junior High (n = 20, small) (n = 31, large); Sr Hi = Senior High (n = 34, small) (n = 37, large).
df = n − 1; * = $p < .05$.

Table 43 suggests that school principals indicated differences on the 23 goals statements relative to their present and future perspective. Table 43 presents (a) group means for each of the 23 goal statements from both perspectives, present and future, (b) calculated

value of t, and (c) an indication of the significance of the t-test at the .05 level. As in the previous table, for ease of comparison, Table 43 simultaneously presents this information for all strata of school principals. No statistical calculations were made between strata, only between present and future perspective.

Junior high principals in large schools rated the goal statements, relative to present or future perspective, significantly different in all but four cases. The exceptions were items 1, 4, 9, and 14 concerning handyman activities, safety, workmanship, and vocational training. They considered these goals to remain average in importance. They also considered goals concerning technology and society to be more important in future programs. Similarly, senior high principals in large schools rated the goal statements, relative to perspective, significantly different in all but six cases. The exceptions were items 1, 9, 12, 14, 18, and 23 concerning handyman activities, workmanship, leisure, use of tools, vocational training, and vocational experience. These goals would remain important to very important.

Junior high principals of small schools rated the following 13 goals, relative to perspective, significantly different: items 2, 3, 6, 8, 10, 11, 12, 15, 17, 19, 20, 21, and 22. These contemporary goals are important to the respondents in future programs but the goals concerning such items as workmanship, safety, techniques, and vocational training would remain no different than rated in the present programs. Senior high principals of small schools rated the importance of program goals significantly higher for programs of the future in 18 out of the 23 items. Those various items were: 2, 3, 4, 5, 6, 8, 10, 11, 13, 14, 15,

Table 43

Mean Comparisons and Related t-Tests for Unweighted Subgroups of Building Principals

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Large Schools				Small Schools			
		Jr Hi Means	t Test	Sr Hi Means	t Test	Jr Hi Means	t Test	Sr Hi Means	t Test
P-1	Handyman activities	3.31		3.28		3.18		3.38	
			1.44		1.07		1.65		1.84
F-1		3.56		3.41		3.39		3.57	
P-2	Solution to societal problems	2.63		3.13		2.71		3.10	
			6.44*		3.61*		3.99*		4.66*
F-2		3.97		3.97		3.54		3.69	
P-3	Application of science and math	3.13		3.25		2.96		3.36	
			5.26*		4.10*		3.83*		4.37*
F-3		4.00		4.10		3.83		4.37	
P-4	Habits of health and safety	4.44		4.25		4.43		4.52	
			1.77		2.78*		0.00		2.08*
F-4		4.75		4.50		4.43		4.62	
P-5	Develop technical talents	3.21		3.59		3.68		3.90	
			4.37*		2.37*		1.98		3.38*
F-5		4.13		4.13		3.96		4.29	
P-6	Work, leisure, and citizenship	3.23		3.44		3.50		3.57	
			6.02*		4.34*		3.55*		3.97*
F-6		4.31		4.13		3.96		4.02	
P-7	Discover interests and aptitudes	3.56		3.63		3.93		3.90	
			2.83*		2.06*		2.05		3.11
F-7		4.16		3.91		4.18		4.19	
P-8	Changes in materials, industrial processes,	3.62		3.25		3.18		3.57	
			5.04*		4.59*		3.91*		5.26*
F-8	and products	4.16		4.16		3.82		4.14	
P-9	Good workmanship and design	3.81		4.34		4.07		4.14	
			1.98		0.81		1.00		1.74
F-9		4.23		4.41		4.14		4.31	
P-10	Evolution and relationships of society	2.56		2.81		2.79		3.00	
			7.64*		4.63*		3.58*		4.82*
F-10	and technical means	3.69		3.69		3.32		3.50	
P-11	Educational and occupational choices	3.13		3.75		3.54		3.88	
			4.18*		3.26*		3.10*		4.63*
F-11		3.81		4.19		4.00		4.45	
P-12	Leisure time interests	3.66		3.53		3.50		3.48	
			2.70*		1.67		3.00*		0.94
F-12		4.13		3.84		3.75		3.57	

Table 43 (continued)

P-13	Integration of	3.06		3.09		3.57		3.52	
	educational studies		4.71*		5.08*		1.66		3.57*
F-13		3.97		3.88		3.82		3.93	
P-14	Vocational training	3.25		4.00		3.46		4.07	
			1.58		0.21		0.33		2.24*
F-14		3.59		4.03		3.50		4.26	
P-15	Nature and character-	2.97		3.03		3.14		3.26	
	istic of technology		5.64*		5.15*		4.36*		4.58*
F-15		4.09		4.13		3.75		3.79	
P-16	Technical skill	3.22		3.56		3.61		3.57	
	and knowledge		2.32*		2.79*		0.81		3.75*
F-16		3.75		4.03		3.68		3.93	
P-17	Beliefs and values	2.56		2.91		2.82		3.10	
	based on the impact		6.47*		6.76*		3.62*		6.74*
F-17	of technology	3.88		4.03		3.39		3.74	
P-18	Tools, techniques,	3.72		4.19		4.11		4.12	
	and resources of		2.72*		1.44		1.14		3.42*
F-18	industry/technology	4.25		4.38		4.21		4.38	
P-19	Problem-solving	3.03		3.59		3.39		3.86	
	skills		5.66*		4.76*		4.09*		4.39*
F-19		4.06		4.41		4.00		4.38	
P-20	Consumer knowledge	3.03		3.50		3.21		3.81	
			4.34*		3.63*		3.06*		2.91*
F-20		3.72		4.06		3.64		4.10	
P-21	Insight into	2.88		3.06		2.89		3.24	
	industry		5.07*		3.67*		3.83*		3.95*
F-21		3.91		3.75		3.46		3.67	
P-22	Understanding of	2.81		2.78		2.89		3.10	
	technical culture		5.82*		4.98*		3.06*		4.87*
F-22		4.03		3.78		3.32		3.57	
P-23	Prevocational	3.00		3.84		2.89		3.69	
	experiences		2.17*		1.65		1.77		2.57
F-23		3.38		4.19		3.18		4.00	

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal. Key (Likert scale) was used to calculate means. Group designation: Jr Hi = Junior High (n = 28, small) (n = 32, large); Sr Hi = Senior High (n = 42, small) (n = 32, large).
df = n - 1; * = $p < .05$.

16, 17, 18, 19, 20, 21, and 22. The exceptions were generally goals concerning handyman activities, workmanship, and career experience.

Upon perusal of Table 43, one will note that 12 of the 23 program goals were unanimously rated significantly different by all four of the

subgroups of school principals. The vast majority of these goals were classified contemporary and consisted of items 2, 3, 6, 8, 10, 11, 15, 17, 19, 20, 21, and 22.

Table 44 summarizes the results reported by school board presidents of districts comprised of small schools. It indicates that 12 of the 23 program goals were rated significantly different concerning their perspective on the importance of program goals in present programs compared to future industrial arts programs. Of significant difference were items 1, 2, 5, 6, 8, 11, 14, 15, 17, 20, 22, and 23 which consisted of a variety of contemporary and traditional goals. They also cited educational and occupational choices as most important.

Those individuals presiding over school districts comprised of large schools failed to indicate a mean significant difference between program goals, due to perspective, in the majority (18 out of 23) of the items. Only items 2, 6, 7, 10, and 12 concerning goals such as leisure, and technology and society, were considered of significant difference at the .05 level.

Upon comparison of school board presidents of both small and large schools, only two goals, item 2 (solutions to societal problems) and item 6 (work, leisure and citizenship) were selected as being significantly different, from present and future perspectives. Both groups also failed to indicate significant differences on a variety of traditional and contemporary program goals (items 3, 4, 9, 13, 16, 18, 19, and 21). They are apparently satisfied with the above average importance placed on these goals.

Table 44

Mean Comparisons and Related t-Tests for Unweighted Subgroups of School Board Presidents

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Small		Large	
		Means	t-Test	Means	t-Test
P-1	Handyman activities	3.10		3.00	
			2.33*		1.00
F-1		3.62		3.23	
P-2	Solution to societal	2.90		3.46	
	problems		2.47*		2.50*
F-2		3.57		4.00	
P-3	Application of	3.62		3.62	
	science and math		1.67		1.48
F-3		3.95		3.92	
P-4	Habits of health	3.86		3.92	
	and safety		1.87		0.00
F-4		4.33		3.92	
P-5	Develop technical	3.19		3.92	
	talents		3.51*		1.17
F-5		3.95		4.23	
P-6	Work, leisure,	2.76		3.15	
	and citizenship		2.97*		2.94*
F-6		3.48		3.69	
P-7	Discover interests	3.24		3.15	
	and aptitudes		1.38		3.41*
F-7		3.57		3.77	
P-8	Changes in materials,	3.00		3.08	
	industrial processes,		3.51*		0.89
F-8	and products	3.76		3.38	
P-9	Good workmanship	3.57		3.85	
	and design		0.89		0.00
F-9		3.81		3.85	
P-10	Evolution and rela-	2.33		2.69	
	tionships of society		2.01		2.52*
F-10	and technical means	2.76		3.15	
P-11	Educational and	3.43		3.69	
	occupational choices		3.07*		0.00
F-11		4.19		3.69	
P-12	Leisure time interests	2.86		3.08	
			1.23		2.92*
F-12		3.19		3.77	

Table 44 (continued)

P-13	Integration of	3.19		3.38	
	educational studies		1.79		1.48
F-13		3.57		3.54	
P-14	Vocational training	3.33		3.38	
			2.43*		0.23
F-14		4.05		3.46	
P-15	Nature and character-	2.71		2.92	
	istic of technology		2.22*		1.59
F-15		3.19		3.31	
P-16	Technical skill	3.24		3.31	
	and knowledge		1.58		0.43
F-16		3.57		3.38	
P-17	Beliefs and values	2.48		2.46	
	based on the impact		2.87*		1.33
F-17	of technology	3.14		2.85	
P-18	Tools, techniques,	3.52		3.46	
	and resources of		1.87		0.00
F-18	industry/technology	4.00		3.46	
P-19	Problem-solving	3.43		3.46	
	skills		1.96		1.59
F-19		4.05		3.85	
P-20	Consumer knowledge	2.81		2.85	
			2.65*		0.43
F-20		3.43		2.92	
P-21	Insight into	2.57		3.00	
	industry		1.75		0.37
F-21		3.00		2.92	
P-22	Understanding of	2.52		2.77	
	technical culture		2.75*		0.00
F-22		3.05		2.77	
P-23	Prevocational	2.86		3.38	
	experiences		3.70*		0.21
F-23		3.71		3.46	

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal. Key (Likert scale) was used to calculate means. Group designation: Small = < 500 enrollment (n = 21); Large = > 499 enrollment (n = 13).
df = n - 1; * = $p < .05$.

Table 45 compares industrial arts teachers with industrial arts teacher educators concerning their present and future perspectives of the 23 goals. To accomplish this, weighted group means of all strata of industrial arts teachers were compared with weighted group means of all

Table 45

Mean Comparisons and Related t-Tests for Weighted Groups of Industrial Arts Teachers and Industrial Arts Teacher Educators between Present and Future Perspective

Perspective (P or F) and Item Number	Program Goal (abbreviated)	Teacher Means	Teacher t-Test	Teach Educ Means	Teach Educ t-Test
P-1	Handyman activities	3.59		2.61	
			7.45*		-1.24
F-1		3.86		2.35	
P-2	Solution to societal problems	3.26		3.57	
			17.89*		5.09*
F-2		3.96		4.39	
P-3	Application of science and math	3.52		3.39	
			15.71*		5.60*
F-3		4.20		4.52	
P-4	Habits of health and safety	4.82		4.00	
			1.07		0.00
F-4		4.85		4.00	
P-5	Develop technical talents	4.06		3.91	
			8.71*		1.89
F-5		4.34		4.26	
P-6	Work, leisure, and citizenship	3.80		3.52	
			6.89*		4.23*
F-6		4.05		4.35	
P-7	Discover interests and aptitudes	3.82		3.74	
			9.57*		1.55
F-7		4.10		3.96	
P-8	Changes in materials, industrial processes,	3.60		3.96	
			13.36*		1.58
F-8	and products	4.21		4.29	
P-9	Good workmanship and design	4.50		3.87	
			1.26		-1.31
F-9		4.54		3.65	
P-10	Evolution and relationships of society	2.77		3.22	
			15.55*		5.30*
F-10	and technical means	3.37		4.23	
P-11	Educational and occupational choices	3.83		3.74	
			8.85*		3.43*
F-11		4.17		4.09	
P-12	Leisure time interests	3.50		2.96	
			4.70*		0.29
F-12		3.65		2.87	

Table 45 (continued)

P-13	Integration of	3.36		3.30	
	educational studies		12.44*		4.40*
F-13		3.95		4.22	
P-14	Vocational training	3.64		3.00	
			10.25*		1.30
F-14		4.01		2.74	
P-15	Nature and character-	3.29		3.43	
	istic of technology		15.78*		5.89*
F-15		3.93		4.57	
P-16	Technical skill	3.84		3.65	
	and knowledge		7.36*		0.33
F-16		4.11		3.70	
P-17	Beliefs and values	2.93		3.30	
	based on the impact		15.93*		5.52*
F-17	of technology	3.61		4.22	
P-18	Tools, techniques,	4.26		4.00	
	and resources of		3.89*		2.01
F-18	industry/technology	4.38		4.22	
P-19	Problem-solving	4.04		3.96	
	skills		10.47*		3.48*
F-19		4.47		4.57	
P-20	Consumer knowledge	3.70		3.30	
			9.37*		0.57
F-20		4.07		3.39	
P-21	Insight into	3.37		3.78	
	industry		12.44*		2.34*
F-21		3.82		4.13	
P-22	Understanding of	3.05		3.35	
	technical culture		13.73*		6.01*
F-22		3.57		4.22	
P-23	Prevocational	3.49		3.17	
	experiences		7.42*		-0.42
F-23		3.81		3.09	

Note. Key: 5 = very important goal; 4 = important goal; 3 = moderately important goal; 2 = slightly important goal; 1 = not a goal. Key (Likert scale) was used to calculate means. Group designation: Teacher = industrial arts teacher (n = 533); Teach Educ = Industrial Arts Teacher Educator (n = 23).
df = n - 1; * = $p < .05$.

industrial arts teacher educators. It should be noted that data from both groups are presented for ease of comparison only. There were no statistical calculations between groups (teachers and educators). Industrial arts teachers as a group rated all items, with the exception

of items 4 and 9, (safety and workmanship, respectively) significantly more important for their future programs than for their present programs.

In contrast, industrial arts teacher educators perceived less than half (11 of 23) of the program goals to be significantly different when comparing their perception of present program goals to future program goals. The goals of significant difference were items 2, 3, 6, 10, 11, 13, 15, 17, 19, 21, and 22 concerning primarily contemporary goals such as technology, culture, and values.

Teachers and teacher educators both reported significant group mean differences on items 2, 3, 6, 10, 11, 13, 15, 17, 19, 21, and 22 which represented primarily contemporary goals. In all significant cases, goals were rated higher as perceived in their future programs. Both groups failed to indicate significant differences in group means on item 4 (health and safety) and item 9 (good workmanship). Teacher educators placed less importance on these goals, from both perspectives, than did industrial arts teachers.

ITEMIZED ANALYSIS AND RANK ORDER OF PROGRAM GOALS

The following presentation of data is included for convenience in observing generalized (all groups combined) mean ratings and rank of a specific program goal for industrial arts.

Itemized Analysis of Program Goals

1. Handyman activities. This goal ranked 15th (3.413) and 19th (3.669) in importance in present and future programs, respectively, when means of all groups were averaged. However, all groups (teachers,

teacher educators, school board presidents, and principals) did not agree on their ratings from either present or future program perspective. Of the four groups, industrial arts teachers rated this goal highest and teacher educators rated it lowest in both present and future programs.

2. Solutions to societal problems. Relative to group means, this goal ranked 20th (3.125) and 15th (3.826) as a goal in present and future programs, respectively. Teacher educators rated it highest while principals rated it lowest from both present and future perspective.

3. Application of science and math. This goal ranked 13th (3.441) in the present program and 10th (4.031) relative to future programs. There was no significant difference between teachers, teacher educators, school board presidents, or principals when rating this goal from the present perspective, however, differences did occur when rated from the future perspective. It may be useful to note that school board presidents rated this goal higher than other groups when perceived for their present program. Teacher educators rated it highest for future programs while principals rated it lowest in present and future programs.

4. Habits of health and safety. This goal ranked 1st in importance to both present (4.548) programs and future (4.668) programs when all group means were averaged. When individual groups were observed, teachers rated it highest and teacher educators rated it lowest in both present and future programs.

5. Developing technical talents. Group ratings were significantly different from present perspective, but not future perspective. This

goal ranked 4th (3.845) in the present program and 5th (4.241) in the future program. As a group, teachers rated it highest and school board presidents rated it lowest, from both perspectives.

6. Work, leisure, and citizenship. This goal was rated significantly different by all groups and ranked 11th (3.540 present and 3.972 future) when rated from either perspective. As perceived in their present programs, teachers rated it highest and school board presidents rated it lowest, however, from future perspective, principals rated it highest and teacher educators lowest. Group ratings were significantly different from both perspectives.

7. Discovering interests and aptitudes. A significant difference was found between groups (from both perspectives) pertaining to item 7. This goal ranked 7th (3.741) and 9th (4.043) in present and future programs, respectively. Among groups, principals rated it highest and school board presidents lowest.

8. Changes in materials, industrial processes, and products. Significant differences were observed between ratings of various groups concerning this goal. It ranked 12th (3.469) and 7th (4.107) in present and future programs, respectively. Regardless of perspective, teacher educators rated it highest and school board presidents rated it lowest.

9. Good workmanship and design. Significant differences were observed between groups on their rating of item 9. Teachers consistantly rated this goal highest and school principals rated it lowest. Item nine ranked 2nd (4.217) from present perspective and 3rd (4.322) from future perspective, when all groups were averaged.

10. Evolution and relationships of society and technical means. This item was rated significantly different by groups, from present and future perspective. Teacher educators rated it highest and school board presidents rated it lowest. This goal ranked last (23rd) when rated from either perspective relative to present and future programs. Its mean rating among groups was 2.784 and 3.369, respectively.

11. Educational and occupational choices. This item was rated significantly different from present and future perspective. From the present perspective, teachers rated it highest and school board presidents rated it lowest. On the other hand, from future perspective, principals rated it highest and teacher educators rated it lowest. This goal ranked 6th (3.744) in the present program and 6th (4.217) in the future program when overall group means were considered.

12. Leisure time interests. This item was rated significantly different by groups, from either perspective. This goal ranked 16th (3.395) and 21st (3.558) from present and future perspective, respectively. In both cases, principals rated it highest and teacher educators rated it lowest.

13. Integration of educational studies. Groups rated this goal significantly different from the future perspective, but not significantly different from the present perspective. Relative to present programs, principals rated it highest and teacher educators lowest. On the other hand, relative to future programs, teacher educators rated it highest and school board presidents lowest. Item 13 ranked 17th (3.369) in the present program and 14th (3.881) in the future program.

14. Vocational training. Groups differed significantly in their ratings, from both perspectives on this item. This goal ranked 8th in both present and future programs. It acheived a mean rating of 3.695 in the present program and 4.091 in the program of the future. Respondents from small schools and junior and senior high schools rated it significantly different as perceived in their present program.

15. Nature and characteristics of technology. Groups rated this item significantly different from both perspectives. Teacher educators rated it highest and school board presidents rated it lowest, from both present and future perspectives. This goal ranked 19th (3.179) in the present program and 17th (3.797) in the program of the future.

16. Technical skill and knowledge. Again, groups differed significantly on this goal. Teachers rated it highest and school board presidents rated it lowest, regardless of perspective. Item 16 ranked 9th (3.653) in the present program and 12th (3.945) relative to the future program.

17. Beliefs and values based on the impact of technology. This item was rated significantly different by teachers, teacher educators, school board presidents, and principals. Teacher educators rated this goal highest while school board presidents rated it lowest, from both perspectives. When means of all groups were averaged, item 17 ranked 22nd (2.908) in the present program and 20th (3.621) relative to the program of the future.

18. Tools, techniques, and resources of industry/technology. Groups differed significantly on their rating of this goal from both perspectives. Teachers rated it highest and school board presidents

rated it lowest, regardless of perspective. This goal ranked 3rd (4.051) in present programs and 4th (4.303) in programs of the future.

19. Problem-solving skills. This item was rated significantly different by all groups. Teachers rated it highest in their present programs while teacher educators rated it highest as perceived in programs of the future. School board presidents rated it lowest regardless of perspective. This item ranked 5th in the present program and 2nd in the future program.

20. Consumer knowledge. This goal was rated significantly different from both perspectives. Teachers rated it highest and school board presidents rated it lowest, regardless of perspective. This item ranked 10th (3.554) in the present program and 13th (3.929) relative to future programs.

21. Insight into industry. Groups rated this goal significantly different, also. Teacher educators rated it highest and school board presidents rated it lowest, regardless of perspective. Item 21 ranked 18th (3.189) and 19th (3.651) respectively in present and future programs when all group means were averaged.

22. Understanding of technical culture. This goal was rated significantly different by all groups, regardless of perspective. Teacher educators rated it highest and school board presidents rated it lowest, regardless of perspective. Item 22 ranked 21st (2.969) in present programs and 22nd (3.517) relative to future program goals.

23. Prevocational experience. Groups rated this goal significantly different from both perspectives. Principals rated it highest and school board presidents rated it lowest, regardless of perspective.

This goal ranked 14th (3.436) in the present program ratings and 16th (3.945) in future program ratings.

Rank Order of Program Goals

Rank order of program goals by individual groups (positions) was of interest for comparison. Table 46 displays the rank order of present program goals for all groups. Table 47 displays the rank order of future program goals for all groups.

Table 46

Rank Order of Present Program Goals by Position

Item No.	Program Goal	Position I.A. Teach.	School Princ.	S.B Pres.	Teach. Educ.
1.	Handyman activities	12	16	12	23
2.	Solution to societal problems	20	20	14	11
3.	Application of science and math	15	17	2	14
4.	Habits of health and safety	1	1	1	1
5.	Develop technical talents	4	6	8	5
6.	Work, leisure, and citizenship	9	12	18	12
7.	Discover interests and aptitudes	7	5	10	8
8.	Changes in materials, industrial processes, and products	13	14	13	3
9.	Good workmanship and design	2	2	3	6
10.	Evolution and relationships of society and technical means	23	23	23	19
11.	Educational and occupational choices	8	7	5	9
12.	Leisure time interests	16	13	16	22
13.	Integration of educational studies	17	15	11	16
14.	Vocational training	11	4	7	21
15.	Nature and characteristics of technology	19	18	19	13
16.	Technical skill and knowledge	6	11	9	10
17.	Beliefs and values based on the impact of technology	22	22	22	17
18.	Tools, techniques, and resources of industry/technology	3	3	4	2
19.	Problem-solving skills	5	8	6	4
20.	Consumer knowledge	10	9	17	18
21.	Insight into industry	18	19	20	7
22.	Understanding of technical culture	21	21	21	15
23.	Prevocational experiences	14	10	15	20

Table 47

Rank Order of Future Program Goals by Position

Item No.	Program Goal	Position I.A. Teach.	School Princ.	S.B Pres.	Teach. Educ.
1.	Handyman activities	17	22	12	23
2.	Solution to societal problems	14	18	11	4
3.	Application of science and math	7	15	7	3
4.	Habits of health and safety	1	1	1	15
5.	Develop technical talents	5	6	5	6
6.	Work, leisure, and citizenship	11	10	16	5
7.	Discover interests and aptitudes	9	7	13	16
8.	Changes in materials, industrial processes, and products	6	9	9	7
9.	Good workmanship and design	2	5	8	18
10.	Evolution and relationships of society and technical means	23	23	23	8
11.	Educational and occupational choices	8	3	2	14
12.	Leisure time interests	21	20	18	21
13.	Integration of educational studies	15	12	14	9
14.	Vocational training	13	8	4	22
15.	Nature and characteristics of technology	16	16	19	1
16.	Technical skill and knowledge	10	13	15	17
17.	Beliefs and values based on the impact of technology	20	17	20	10
18.	Tools, techniques, and resources of industry/technology	4	2	6	11
19.	Problem-solving skills	3	4	3	2
20.	Consumer knowledge	12	11	17	19
21.	Insight into industry	18	19	22	13
22.	Understanding of technical culture	22	21	21	12
23.	Prevocational experiences	19	14	10	20

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

Statement of the Problem

The research problem associated with this study was to determine the present status and the desired future of industrial arts goals in the public schools in the State of Nebraska, as perceived by industrial arts teachers, school principals, school board presidents, and industrial arts teacher educators. Two dimensions were examined: the importance of 23 program goal statements as perceived in the present industrial arts program, and the importance of the same goal statements as perceived for the industrial arts program in the future.

Purpose of the Study

The purpose of this study was to describe the present status and the desired future of industrial arts goals. Five underlying purposes were to determine if differences existed concerning the importance of program goals due to: (a) position (teacher, teacher educator, principal, school board president), (b) level (junior high, senior high), (c) school size (small, large), (d) teachers' personal characteristics (membership in professional organizations, teaching experience, educational attainment, age, source of bachelors and masters degree, teaching load, and status of teacher certification), and (e) perspective (present, future). It was anticipated that the

completion of this study would provide an avenue of understanding that would more closely identify the perceptions of teachers, teacher educators, principals, and school board presidents concerning the educational objectives of industrial arts and its ability for preparing students for a technological society. The following research questions were developed to address the purpose of this study:

1. Were there differences among industrial arts teachers, industrial arts teacher educators, school principals, and school board presidents on perceived present and future program goals of industrial arts as measured by the oneway analysis of variance?

2. Were there differences among school principals, school board presidents, and industrial arts teachers of small schools compared with large schools regarding their perception of present and future program goals of industrial arts as measured by a oneway analysis of variance?

3. Were there differences between school principals and industrial arts teachers of junior high schools compared with senior high schools regarding their perception of present and future program goals of industrial arts as measured by a oneway analysis of variance?

4. Were there differences due to industrial arts teachers' memberships in professional organizations (state and national) relative to the importance of present and future program goals as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

5. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to source of

bachelors degree as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

6. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to source of masters degree as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

7. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to class load as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

8. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to level of education as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

9. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to number of years of industrial arts teaching experience as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

10. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to their age as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

11. Were there differences among industrial arts teachers on their perceptions of present and future program goals due to status of teacher certification as measured by the Chi-square test for independence incorporating a two-way crosstabulation?

12. Were there differences between respondents' perceptions of program goals due to perspective (present/future) as measured by a matched pairs t-test (correlated t)?

Review of Literature

A review of the literature was conducted to conceptualize the problem of study as it related to: (a) the present status of industrial arts, nationally, (b) the future of industrial arts from a state and national perspective, (c) the appropriate populations, i.e. the impact of teachers, teacher educators, principals, and school board presidents on curriculum implementation and change, and (d) an appropriate research methodology for conducting such a study. Resources included in the literature search were: Dissertation Abstracts International (DAI), Resources in Education (RIE), Current Index to Journals in Education (CIJE), Council on Technology Teacher Education--National Association of Industrial Technical Teacher Educators (CTTE-NAITTE) abstracts, University of Northern Iowa Library, and Peru State College Library.

Methodology

The review of literature revealed the descriptive survey as an appropriate method for conducting research relative to the problem statement. It also revealed a similar study (Frey, 1985) done in a three-state area concerning industrial arts program goals. Upon permission from the researcher (see Appendix E), the questionnaire employed by Frey (1985) was adapted to query the populations to be studied in the State of Nebraska. Adaptations included a format to solicit program goal ratings from two perspectives, present and future.

In addition, a second section was developed to identify personal characteristics of industrial arts teachers. The original 23 program goals of the Frey (1985) study were unchanged. These program goals were the result of a crosstabulation of goals identified in (a) Industrial Arts Education: A Survey of Programs, Teachers, Students and Curriculum (Schmitt & Pelley, 1966), (b) Dugger's 1980 Standards Project for industrial arts, (c) the 1974 Atkins study of 550 goals for industrial arts identified in the literature, and (d) the Jackson's Mill Curriculum Theory (Snyder & Hales) of 1981.

In an effort to achieve a representative sample of the populations to be studied, a disproportionate, stratified random sample was drawn. Stratification was deemed necessary to improve representation from small and large schools, and from junior and senior high schools. Due to stratification, some subgroups of the populations were small in number, therefore, a disproportionate sample was utilized. As a result, when generalizations were to be made for total populations, a weighting factor, detailed in Chapters 2 and 3, was applied to the disproportionate subgroups. Responses of samples were representative of their various populations as presented in section one of Chapter 4.

Face validity of the instrument was determined by (a) the dissertation committee, (b) professional personnel from the Nebraska State Department of Education, and (c) fellow doctoral students, co-workers, and a sample of industrial arts teachers not selected for inclusion in the sample population to be studied. Each group reviewed the questionnaire and offered suggestions for its improvement. Modifications were made to reflect the suggestions of these groups.

The questionnaire and a postage-paid return envelope were mailed first class to the four population samples. Section I was mailed to all four groups. This section addressed the 23 program goal statements by asking respondents to rate the goal statement on a five-point rating scale from "very important program goal" to "not a program goal." In addition, respondents were asked to make the rating two times, once from their perspective as the goal applied to their present program and once from their perspective as the goal would apply to their program in the future. Section II was mailed only to industrial arts teachers and solicited information pertaining to teachers' personal characteristics. To bolster adequate return rates for the questionnaire, a three-step follow-up was employed. If the questionnaire had not been received within eight days of the initial mailing, a postcard was mailed to encourage the individual to respond. If after five more days there was no response, a second questionnaire and postage-paid return envelope were mailed. If after five additional days a 50% return rate had not been achieved, a telephone call was made to encourage response. When all groups were considered, an overall return rate of 84.82% was achieved.

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). Data were coded and entered on a remote terminal (Peru State College) of the State of Nebraska's I.B.M. mainframe computer in Lincoln. Data analysis was accomplished by employing three variations of statistical tests. For research questions 1 through 3, a oneway analysis of variance was employed to determine differences among survey groups on mean ratings of program goals. For

4 through 11, the Chi-square test of independence was utilized as the appropriate statistical test of significance. For research question 12, concerning differences in perspective, the matched pairs t-test (two-tailed) was conducted on program goal ratings and was compared with teachers, principals, school board presidents, and teacher educators. The .05 level of significance was utilized on all statistical tests.

FINDINGS OF THE STUDY

The findings of the study are presented in two categories: (a) findings relative to the personal characteristics of industrial arts teachers, and (b) findings relative to the effect of variables on program goal statements.

Personal Characteristics of Teachers

1. Most industrial arts teachers in the State of Nebraska (61.9%) teach between four and six periods per day. An additional 34.2% teach more than six periods per day.

2. The masters degree had been attained by 43.6% of the industrial arts teachers. An additional 13.6% have 30 hours beyond their masters and 3.6% have received the educational specialist degree. Proportionately, teachers in junior high schools had more education beyond the masters than did senior high teachers. Similarly, teachers in large schools had more education beyond the bachelors degree than did teachers in small schools.

3. When teaching experience was considered, the majority (39.0%) of industrial arts teachers had taught 15 years or more, regardless of

teaching level (junior high, senior high) and school size (small, large).

4. The vast majority (95.9%) of the industrial arts teachers in Nebraska were fully certified to teach industrial arts.

5. The majority (62.5%) of the industrial arts teachers did not hold membership in any national professional organization for industrial arts. Teaching level and school size made little difference concerning this observation. However, 30.0% of the industrial arts teachers belonged to the International Technology Education Association. Teachers in large schools and junior high schools appeared more likely to belong to this organization. Membership in the American Vocational Association was indicated by 8.0% of the teachers and membership in Epsilon Pi Tau was indicated by 9.1% of the teachers. Membership in "other" national professional organizations was indicated by 4.5%.

6. One half of the industrial arts teachers in Nebraska did not belong to any state professional organization for industrial arts. However, 49.0% indicated they belonged to the Nebraska Industrial Education Association (recently renamed the Nebraska Industrial Technology Education Association), 3.2% held membership in the Nebraska Vocational Association, and 6.7% indicated they were members of "other" state professional organizations.

7. The majority of industrial arts teachers (44.1%) were between the ages of 31 and 40 years. No apparent differences were noted when classified by school size or teaching level. The next most represented age groups were 41 to 50 years (22.3%) and 21 to 31 years (20.6%).

8. Most (27.1%) of the industrial arts teachers in Nebraska received their bachelors degree at Kearney State while an additional 13% indicated they received their bachelors degree out of state.

9. The majority (36.0%) of industrial arts teachers with masters degrees received their degree from Kearney State while 17.8% indicated they received their masters degree out of state.

Effect of Variables on Program Goal Statements

1. Position within the educational community (teacher, teacher educator, principal, school board president) made a significant difference on ratings of 22 of the 23 program goal statements, as rated from present program perspective. The goal in which no difference was observed pertained to integration of educational studies. When rating goals from future perspective, position made significant differences on all goals. This is interpreted to mean that considerable disagreement exists among education professionals concerning the importance of program goals in industrial arts. Upon comparison of groups, teachers consistently rated goals highest, principals next highest, and school board presidents lowest. It appeared that as respondents amount of direct exposure to the program increased, program goal ratings also increased. The lower goal ratings that were typical for school board presidents may be attributed to their global and more distant view of the educational system. Teacher educators were not consistent in goal ratings. They had a tendency to rate contemporary goals such as the relationship of technology to society and the evolution of technology, higher for both present and future programs. They rated the importance of traditional goals such as workmanship, handyman activities, and

vocational education lower in importance for programs in the future. It is apparent that teacher educators envision some foundational changes in program goals for the future. Although industrial arts teachers perceive change (more importance on all goals) for future programs, it appears that the change will be merely doing "more of the same, only better."

2. Teachers, principals, and school board presidents of small schools differed more often on their ratings of program goals than did the corresponding groups in large schools. They differed on all of the program goals from present perspective and all but two goals from future perspective. The exceptions concerned the above average importance of vocational training and vocational experience in their future industrial arts programs. This may best be explained by the non-college preparatory nature of most small, rural schools. Again it was quite evident that teachers rated goals highest, principals next highest and school board presidents lowest.

3. Teachers, principals, and school board presidents in large schools differed on nine program goals when rated from present program perspective. They concerned the very traditional goals of safety, technical skills, and workmanship, and one contemporary goal concerning solution to societal problems. The differences appeared to be due to the inordinate amount of importance that teachers placed on the traditional goals. School principals tended to rate highly the importance of goals concerning solutions to societal problems. This may be interpreted as a moderate desire of principals to move toward a more contemporary industrial arts program. When goals were rated from future

perspective, differences were observed on 11 items concerning a variety of goal characteristics. It appeared that school board presidents rated these goals lower than did teachers or principals. In general, it appeared that groups within the large schools are in relative agreement on the present and desired future of industrial arts. This may be attributed to the observation that teachers in large schools were more professionally involved, had achieved higher levels of education, and had accumulated more years of age and experience.

4. Teachers and principals in junior high schools differed very little on their ratings of industrial arts program goals. From present perspective, differences were observed only on goals concerning good workmanship, problem solving, safety, and insight to industry. In all cases, teachers rated these goals as more important than did principals. From future perspective, differences were observed only on goals concerning safety, workmanship, and consumer knowledge. Again, teachers rated these higher than did principals. With these exceptions, positions in the junior high schools are in agreement on the present and desired future of industrial arts. As was the case with teachers in large schools, the increased involvement in professional groups, additional education, age, and experience may have attributed to the increased communication of program goals.

5. Teachers and principals in senior high schools exhibited differences on the majority of their ratings of program goals, regardless of perspective. The goals were represented by the very traditional concepts of workmanship, safety, vocational training, and a very contemporary concept concerning beliefs and values based on

technology. When perceived in their future programs, differences were limited to the traditional goals of industrial arts. When differences occurred, teachers tended to rate traditional goals higher while principals rated vocational education and contemporary goals higher. It is apparent that teachers in senior high schools envision a more traditional approach to industrial arts. However, their superiors tend not to agree.

6. Members and nonmembers of state organizations rated 10 program goals differently, as applied to their present program. When goals were rated from future perspective, five differences were observed. In all cases, members rated the contemporary goals more important, and nonmembers rated traditional goals and those pertaining to vocational education more important. Apparently, members of state professional organizations were more abreast of the increased emphasis placed on contemporary goals and, as a result, would consider those goals of increased importance in their programs.

7. Members and nonmembers of national organizations rated seven program goals differently from present perspective and nine program goals differently from future perspective. In all cases, members rated those contemporary goals concerning technology, society, and values more important than nonmembers. Nonmembers rated the traditional goals of leisure, handyman activities, and discovering interests and aptitude of more importance. Again, as was the case with state professional organizations, members of national professional organizations were much more abreast of the emphasis on contemporary goals and as a result would consider those goals of increased importance in their programs.

8. Source of bachelors degree made significant differences when rating all but three program goals from present program perspective. The exceptions concerned safety, good workmanship and design, and prevocational experiences. It would appear that all colleges and the university have, at least in the past, placed emphasis on these goals. When goals were rated as perceived in their future programs, the source of a teacher's bachelors degree made differences in all goal ratings except the goal concerning tools, techniques, and resources of industry/technology. This is interpreted to mean that bachelors degree graduates in Nebraska are not in agreement on the desired future of the industrial arts program.

9. When compared with source of bachelors degree, source of masters degree made fewer significant differences in program goal ratings. When perceived from present program perspective teacher's source of masters degree made no significant difference in nine program goals. When rated from future perspective, all goals except two (concerning evolution of society and technology, and changes in materials) were rated significant. Masters degree graduates were in agreement on the increased importance of these goals. Attainment of additional education only slightly increased the agreement among teachers concerning these goals.

10. Teaching load made significant differences in teachers' ratings of 14 program goals from present perspective and 15 programs goals from future perspective. Regardless of class load, there was general agreement that contemporary goals are of moderate importance in industrial arts. Those with medium class loads (4-6 periods per day)

tended to rate all program goals higher. Those with light and heavy loads appeared to place less importance on program goals. It would appear that teachers with moderate loads consider industrial arts of more importance, and therefore may be more devoted to its continued existence.

11. A teacher's level of educational attainment made significant differences on 17 present program goal ratings and 17 future program goal ratings. Those with more education rated contemporary goals higher, from both perspectives. It would appear that there is a positive relationship between educational attainment and increased importance of contemporary goals. Educational attainment made no difference, from either perspective, on rating the goals concerning application of science and math, changes in materials, or insight into industry. These goals were rated important and very important.

12. Number of years of teaching experience made differences in teachers' ratings of program goals. From present perspective, 16 program goals were rated differently. Fourteen goal statements were rated differently as perceived in future programs. In general, those with moderate levels of experience rated all goals higher, regardless of perspective (present/future) or type (contemporary/traditional).

13. In the majority of cases, a teacher's age in years made significant differences on program goal ratings. Fifteen program goals rated from present perspective, were rated significantly different by various age groups. When rated from future perspective, 20 goals were rated significantly different. As with experience level, those teachers of medium age, (31 to 50 years) rated goals higher regardless of

perspective or type. It would appear that those teachers of medium age valued the importance of industrial arts more than did the age intervals of 21 to 30 or 51 to 60.

14. A crosstabulation of industrial arts teachers at all strata resulted in goal rating differences, due to perspective, on 7 of the 23 goal statements. In all cases those items concerning technology and society were rated significantly different (importance higher in future program) due to perspective. However, it should be noted that these contemporary goals were still considered of less importance than traditional goals. This could be interpreted that teachers are willing to consider these contemporary goals, but are not willing to reduce the emphasis on traditional goals in exchange. It would appear that further research may be appropriate concerning this observation.

15. Similarly, all industrial arts teachers indicated no difference in the level of importance concerning two of the program goals, due to perspective. These were items concerning the traditional goals of safety and workmanship. Teachers place an extremely high value on these goals and will continue to do so in future programs.

16. Principals of all four strata rated items concerning contemporary goals such as technology and society, and application of math and science, to be significantly more important for future program application compared to present program application. These goals were typically rated moderately important in present programs and more important in future programs. It would appear that principals would prefer a significant change toward these contemporary goals in future industrial arts programs.

17. Principals of all four strata did not rate two traditional items (concerning handyman activities and workmanship) significantly different in their present programs than they did relative to future programs. Apparently, principals would prefer that these goals retain the present level of importance ("important" on Likert scale) in future programs.

18. School board presidents rated the goals concerning general education and the traditional goals of industrial arts no differently in present and future programs. They also perceived their ratings of "important" adequate for future programs. They did, however, indicate that goals pertaining to solutions to societal problems, and work, leisure, and citizenship as being much more important for programs of the future.

19. Industrial arts teachers rated all program goals concerning application to future programs higher, with two exceptions. They did not rate safety or workmanship any differently due to perspective. These goals would remain of great importance in future programs. Again, teachers appeared willing to increase the importance of all goals (contemporary included), but appeared not to consider reducing the importance of traditional goals in the process. Industrial arts teachers apparently would like to continue doing "more of the same, only better."

20. Industrial arts teacher educators rated less than half (10 of 23) of the program goals differently due to perspective. They were inclined to rate contemporary goals significantly more important for future programs than present programs. This would seem to indicate

that teacher educators consider the present industrial arts programs in less need of revision than did teachers, principals, or school board presidents. Two traditional goals concerning workmanship and handyman activities, and one goal concerning prevocational experiences, were rated less important for future programs. Teacher educators are apparently willing to reduce the emphasis on these traditional goals in exchange for increased emphasis on contemporary goals.

CONCLUSIONS AND RECOMMENDATIONS

As a result of the presentation and analysis of data in Chapter 4, the following conclusions were made concerning the importance of program goals as perceived in present and future industrial arts programs in the public schools in the State of Nebraska.

1. A consensus does not exist among industrial arts teachers, industrial arts teacher educators, secondary school principals, and school board presidents concerning the importance of industrial arts goals as applied to present or future programs. Administrators and teacher educators would prefer to increase the importance placed on contemporary goals of industrial arts. In an effort to more closely align the perceptions of industrial arts goals, it is recommended that preservice and inservice education of teachers communicate the importance placed on program goals by the various groups in the educational community.

2. School size was correlated with present and future perspective ratings of industrial arts program goals. Teachers, principals, and school board presidents of small schools consistently rated program goals differently more often than did the corresponding groups of large

schools. It appeared that differences were associated with the very high ratings of traditional goals compared with a relatively lower rating of contemporary goals by teachers. The continued existence of programs in small schools may be at greater risk than those in large schools. Therefore, an extra effort should be made to apprise those in small schools of the current trends in the industrial arts program, both within the state and nationally.

3. In general, industrial arts teachers and principals in junior high schools did not differ on either present or future program goal ratings. The corresponding positions in senior high schools differed on approximately one half of the program goals when rated from either perspective. When results from the analysis of variance were examined, the differences existed on the traditional goals of industrial arts. Of the significant personal characteristics that affected teachers' goal ratings, involvement in professional organizations and educational attainment is in the control of the teacher. Therefore, it is recommended that senior high school teachers pursue inservice education and opportunities for professional involvement.

4. Membership (in state or national professional organizations) was correlated with program goal ratings. One half of the program goals were rated differently by members and nonmembers of these organizations. Members fostered an increase in the emphasis on contemporary goals and nonmembers preferred to place importance on the traditional goals of industrial arts. Acknowledging that membership was 38% in national professional organizations and 50% in state professional organizations, it is recommended that those responsible for professional courses in

teacher education institutions be encouraged to stress the importance of participation in professional organizations.

5. Most program goal ratings, regardless of perspective, were rated significantly different due to source of bachelors and masters degree. However, health and safety, workmanship and design, and vocational training were rated no differently due to source of degree. It is recommended that the colleges and the university in Nebraska develop a unified direction for the industrial arts curriculum to more closely align and articulate graduates' perceptions of industrial arts program goals.

6. Contemporary industrial arts program goals were rated significantly different by teachers due to perspective. In general, these goals pertained to problems of society, technical culture, and evolution of technical means in society and were rated significantly more important for programs in the future. Two conclusions can be drawn: (a) teachers consider these goals to be relatively unimportant in their present programs, or (b) these goals will be important in their programs of the future. It is recommended that any efforts in curriculum development include a rationale for the inclusion of these goals and the instructional strategies to implement these goals.

7. Principals rated more contemporary goals of industrial arts, as perceived for application to future programs, significantly higher than did teachers. This could lead one to conclude that principals may identify more closely with traditional goals of industrial arts, at least in present programs, but would prefer to increase the importance placed on contemporary goals for future programs. It is recommended

that any unified curriculum efforts acknowledge this preference during curriculum rationale development.

8. Industrial arts teacher educators, relative to other groups, do not consider present program goals significantly different than future program goals. Neither do they place as much importance on traditional goals, as do teachers. Teacher educators do, however, place more importance on contemporary program goals, especially as perceived in the future program. It is recommended that the perceptions of all groups in the educational community be considered when developing any future state curriculum.

9. There is little doubt that overall, groups in the educational community considered (a) habits of health and safety, (b) good workmanship and design, (c) tools, techniques, and resources of industry/technology, (d) development of technical talents, (e) problem solving skills, and (f) educational and occupational choices, as important goals in their present and future industrial arts programs. It is recommended that any efforts to change to other program goals should include these goals for consideration.

10. Based on ratings of importance of program goals, the present status of the industrial arts program in Nebraska is traditional in nature. Teacher educators, principals, and school board presidents, however, appear to desire to move towards a somewhat more contemporary program in the future. Acknowledging the tremendous importance of the classroom teacher in curriculum success, it is recommended that teachers' viewpoints be included in any curriculum development efforts and that the traditional goals of industrial arts also be considered.

11. Based on the results of this study, it is concluded that the goals of the junior high programs are well accepted by all positions within the educational community. This may be attributed to the exploratory nature of the junior high curriculum that is generally accepted nationally. Therefore, it is recommended that any curriculum development efforts address the senior high curriculum with first priority since it appeared that most discrepancies in program goals were associated with this level.

RECOMMENDATIONS BASED ON THE STUDY

State Department of Education

1. It is recommended that funding in the form of approved requests for proposals (R.F.P.s) be allocated for a unified curriculum project for industrial arts, with emphasis placed on secondary industrial arts program development. This project should mandate the inclusion of industrial arts teachers, teacher educators, and building principals, while also communicating with the local school board.

2. It is recommended that the State Department of Education also encourage and provide opportunities, especially for those in small schools and senior high schools, to upgrade their industrial arts programs. These opportunities could include the expansion of "request for proposal" workshops whereby interested individuals may upgrade their proposal writing skills to address the development of their perceived program goals. The development of an individual program improvement plan may well be appropriate to encourage contemporary program emphasis.

Teacher Education

1. It is recommended that the state colleges in Nebraska and the University of Nebraska coordinate their teacher education preservice programs in an effort to more closely align the perceptions of graduates of those programs. This may best be accomplished by the development of a unified curriculum within the teacher education system. It would appear that this may logically be included in the statewide secondary curriculum development project mentioned earlier.

2. It is recommended that teacher education institutions offer appropriate inservice programs that especially address (a) the needs of teachers in small schools and senior high schools, and (b) the value of acknowledging the perceptions of all groups within the educational community.

Industrial Arts Teachers

1. The results of this study suggest that administrators are interested in curriculum change. Therefore, it is recommended that industrial arts teachers take advantage of inservice education and pursue opportunities for additional education while support for such change is in place.

2. The results of this study also suggest that those teachers who are professionally involved in state and national organizations appear more likely to agree on the goals of industrial arts. Therefore, it is recommended that teachers become professionally involved in an effort to contribute to a unified effort for industrial arts in the State of Nebraska, and that administrators support their involvement.

Principals and School Board Presidents

1. It is recommended that principals encourage teachers to take advantage of opportunities for professional development. This may be accomplished in the form of released time for attendance at workshops and involvement on professional committees.

2. This study has indicated the need for increased communication among the educational community. It is recommended that a program development plan be articulated between individual industrial arts teachers, their school administrators, and state department personnel in an effort to better serve the educational needs in Nebraska.

RECOMMENDATIONS FOR FURTHER STUDY

1. It is recommended that a similar study be conducted in five years to determine the current status of industrial arts and to observe if desired goals for future programs, as reported in this study, did indeed become operational.

2. It is recommended that a study of teacher education institutions within the state be conducted to ascertain what philosophical differences may exist concerning program goals and the resulting impact these differences may have on industrial arts programs throughout the state.

3. It is recommended that a study be conducted to develop or adapt a curriculum model that could assist in the transformation from traditional program goals to contemporary program goals and yet preserve the traditional activity-based goals that, according to the results of this study, are so highly valued by industrial arts teachers.

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APPENDIX A

LETTERS OF TRANSMITTAL

Peru State College

LETTER TO INDUSTRIAL ARTS TEACHERS

November 28. 1986

Dear Mr. Jones.

The enclosed questionnaire is being used to obtain data for a study concerning the present status and possible future of the industrial arts programs in the public secondary schools in the State of Nebraska. The study is being conducted through Peru State College and under the recommendation of personnel in the Nebraska Department of Education. Vocational Division. It is anticipated that this study will provide much needed data on your perceptions on the status and future of industrial arts in our state.

Your response as an industrial arts teacher in the state of Nebraska is critical to the validity of this study. I would very much appreciate your responses to the enclosed questionnaire. It is felt that in order to help industrial arts grow and develop in the state of Nebraska. those individuals. like yourself. with the greatest impact on the success of industrial arts. should be considered first. Your expertise and experience in industrial arts is a valuable source of information that will contribute significantly to this study. For statistical analysis reasons. all responses will be compiled as a group and thus confidentiality of your individual responses is assured. The code number at the top of the questionnaire is for clerical purposes only and will in no other way be used to identify respondents.

It would be appreciated if you could take a few minutes from your busy schedule to complete and return the questionnaire in the stamped self-addressed envelope provided. Your reply within the next three days would be greatly appreciated. The results of the study will be sent to you. if you so desire. by checking the appropriate box on the questionnaire. Your assistance and cooperation in this study is very much appreciated.

Sincerely.

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru, Nebraska 68421 (402) 872-3815

FOLLOW-UP POSTCARD TO INDUSTRIAL ARTS TEACHERS

Dear Mr. Jones, November 20, 1986

Approximately two weeks ago you received a survey form entitled A Study of Industrial Arts Activities in the State of Nebraska. As of this date I have not received the completed survey. If you have just recently returned the previous form, please disregard this reminder.

Your response as an industrial arts teacher in the state of Nebraska is critical to the validity of this study. It would be appreciated if you could take a few minutes from your busy schedule today to complete and return the survey. Thank you.

Sincerely,

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru State College

LETTER TO BUILDING PRINCIPALS

November 28. 1986

Dear Mr. Evans:

The enclosed questionnaire is being used to obtain data for a study concerning the present status and possible future of the industrial arts programs in the public secondary schools in the state of Nebraska. The study is being conducted through Peru State College and under the recommendation of personnel in the Nebraska Department of Education. Vocational Division. It is anticipated that this study will increase the knowledge base concerning administrators, teachers, students, programs and the profession. It will provide the state of Nebraska the opportunity to review past industrial arts goals. envision future industrial arts goals, and ultimately provide a strategy to acheive these goals.

The vital role of the school principal in implementing and evaluating curriculum is acknowledged, therefore. I would very much appreciate your responses to the enclosed questionnaire. It is felt that in order to determine the direction of industrial arts in the state of Nebraska. those individuals. like yourself. should be considered. Your responses are a valuable source of information that will contribute significantly to this study. For statistical analysis reasons. all responses will be compiled as a group and thus confidentiality of your individual responses is assured. The code number at the top of the form is for clerical purposes and will in no other way be used to identify respondents.

It would be appreciated if you could take a few minutes from your busy schedule and complete and return the questionnaire in the stamped self-addressed envelope provided. Your reply within the next three days would be greatly appreciated. The results of the study will be sent to you. if you so desire. by checking the appropriate box on the questionnaire. Your assistance and cooperation in this study is very much appreciated.

Sincerely.

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru, Nebraska 68421 (402) 872-3815

FOLLOW-UP POSTCARD TO BUILDING PRINCIPALS

Dear Mr. Smith: November 20, 1986

Approximately two weeks ago you received a survey form entitled A Study of Goals for Industrial Arts in the State of Nebraska. As of this date I have not received the completed survey. If you have just recently returned the previous form, please disregard this reminder. Your response as a school principal in the state of Nebraska is critical to the validity of this study and as a result your responses to the questionnaire are very important.

It would be appreciated if you could take a few minutes from your busy schedule today to complete and return the survey. Thank you.

Sincerely,

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru State College

LETTER TO INDUSTRIAL ARTS TEACHER EDUCATORS

November 28. 1986

Dear Mr. Johnson,

The enclosed questionnaire is being used to obtain data for a study concerning the present status and possible future of the industrial arts programs in the public secondary schools in the state of Nebraska. The study is being conducted through Peru State College and under the recommendation of personnel in the Nebraska Department of Education. Vocational Division. It is anticipated that this study will provide much needed data on your perceptions on the status and future of industrial arts in our state.

Your response as an industrial arts teacher educator in the state of Nebraska is critical to the validity of this study. I would very much appreciate your responses to the enclosed questionnaire. It is felt that in order to help industrial arts grow and develop in the state of Nebraska. those individuals. like yourself. with great impact on the success of industrial arts. should be considered first. Your expertise and experience in industrial arts is a valuable source of information that will contribute significantly to this study. For statistical analysis reasons. all responses will be compiled as a group and thus confidentiality of your individual responses is assured. The code number at the top of the questionnaire is for clerical purposes only and will in no other way be used to identify respondents.

It would be appreciated if you could take a few minutes from your busy schedule to complete and return the questionnaire in the stamped self-addressed envelope provided. Your reply within the next three days would be greatly appreciated. The results of the study will be sent to you. if you so desire. by checking the appropriate box on the questionnaire. Your assistance and cooperation in this study is very much appreciated.

Sincerely.

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru, Nebraska 68421 (402) 872-3815

FOLLOW-UP POSTCARD TO INDUSTRIAL ARTS TEACHER EDUCATORS

Dear Mr. Johnson, November 20, 1986

Approximately two weeks ago you received a survey form entitled A Study of Goals for Industrial Arts in the State of Nebraska. As of this date I have not received the completed survey. If you have just recently returned the previous form, please disregard this reminder.

Your response as an industrial arts teacher educator in the state of Nebraska is critical to the validity of this study and as a result your responses to the questionnaire are very important.
It would be appreciated if you could take a few minutes from your busy schedule today to complete and return the survey. Thank you.

Sincerely,

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru State College

LETTER TO SCHOOL BOARD PRESIDENTS

November 28, 1986

Dear Mr. Wagner,

The enclosed questionnaire is being used to obtain data for a study concerning the present status and possible future of the industrial arts programs in the public secondary schools in the state of Nebraska. The study is being conducted through Peru State College and under the recommendation of personnel in the Nebraska Department of Education, Vocational Division. It is anticipated that this study will increase the knowledge base concerning administrators, teachers, students, programs and the profession. It will provide the state of Nebraska the opportunity to review past industrial arts goals, envision future industrial arts goals, and ultimately provide a strategy to acheive these goals.

The role of the school board president in infusing local wants and needs into the curriculum is acknowledged, therefore, I would very much appreciate your responses to the enclosed questionnaire. It is felt that in order to determine the direction of industrial arts in the state of Nebraska, those individuals, like yourself, should be considered. Your responses are a valuable source of information that will contribute significantly to this study. For statistical analysis reasons, all responses will be compiled as a group and thus confidentiality of your individual responses is assured. The code number at the top of the form is for clerical purposes and will in no other way be used to identify respondents.

It would be appreciated if you could take a few minutes from your busy schedule and complete and return the questionnaire in the stamped self-addressed envelope provided. Your reply within the next three days would be greatly appreciated. The results of the study will be sent to you, if you so desire, by checking the appropriate box on the questionnaire. Your assistance and cooperation in this study is very much appreciated.

Sincerely,

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

Peru, Nebraska 68421 (402) 872-3815

Serving Southeast Nebraska Since 1867

FOLLOW-UP POSTCARD TO SCHOOL BOARD PRESIDENTS

Dear Mr. Smith: November 20, 1986

Approximately two weeks ago you received a survey form entitled A Study of Goals for Industrial Arts in the State of Nebraska. As of this date I have not received the completed survey. If you have just recently returned the previous form, please disregard this reminder.

Your response as a school principal in the state of Nebraska is critical to the validity of this study and as a result your responses to the questionnaire are very important. It would be appreciated if you could take a few minutes from your busy schedule today to complete and return the survey. Thank you.

Sincerely,

Kennard G. Larson
Assistant Professor of Industrial Technology and Education

APPENDIX B

QUESTIONNAIRE TO
SCHOOL PRINCIPALS,
INDUSTRIAL ARTS TEACHER EDUCATORS, AND
SCHOOL BOARD PRESIDENTS

A STUDY OF GOALS FOR INDUSTRIAL ARTS IN THE STATE OF NEBRASKA

The purpose of this study is to gather data that will be used to identify the perceived status and ultimately the desired future of industrial arts in the State of Nebraska. The collective data given by you will be shared with teachers and teacher educators in Nebraska in an attempt to identify a strategy to move to that desired future. The coding on this sheet is for record-keeping only. No effort will be made to identify individual respondents.

Introduction

The purpose of this study is to compare the positions of industrial arts teachers, building principals, school board presidents, and teacher educators with respect to goals and activities for industrial arts. Directions are provided which explain the nature of the information sought and instructions on how to respond. Please answer the questionnaire completely.

Please mail to:

Kennard G. Larson
P.O. Box 122
Peru State College
Peru, NE 68421

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code # ___

INDUSTRIAL ARTS PROGRAM GOALS

The purpose of this questionnaire is to determine the extent of importance the following statements have in your current industrial arts program and the extent of importance the following statements may have on your future program.

Please indicate the importance you place on each goal statement as industrial arts is currently taught in your program in the left column, and as it would ideally be taught in the future in the right column. Circle the number assigned to the position nearest your own. Please double-check survey form to be certain that you have circled two responses for each item, one in the left column and one in the right column. Space is provided at the end for personal comments.

KEY:
5. VERY IMPORTANT PROGRAM GOAL
4. IMPORTANT PROGRAM GOAL
3. MODERATELY IMPORTANT PROGRAM GOAL
2. SLIGHTLY IMPORTANT AS A PROGRAM GOAL
1. NOT A PROGRAM GOAL

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	1. To develop handyman activities; adjusting and making minor repairs to the industrial products used within the home.	5 4 3 2 1
5 4 3 2 1	2. To develop creative solutions to present and future societal problems using technical means.	5 4 3 2 1
5 4 3 2 1	3. To develop an understanding of the application of science and mathematics.	5 4 3 2 1
5 4 3 2 1	4. The promotion of proper habits of safety and health in relation to work habits.	5 4 3 2 1
5 4 3 2 1	5. To discover and develop creative technical talents in students.	5 4 3 2 1

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	6. To explore and develop human potentialities related to responsible work, leisure, and citizenship roles in a technological society.	5 4 3 2 1
5 4 3 2 1	7. To discover interests and aptitudes through trial experiences and first-hand study.	5 4 3 2 1
5 4 3 2 1	8. To gain knowledge of the changes in materials required to meet the needs of society, to understand industrial processes and to become familiar with the products of industry.	5 4 3 2 1
5 4 3 2 1	9. To appreciate good workmanship and design.	5 4 3 2 1
5 4 3 2 1	10. To understand and appreciate the evolution and relationships of society and technical means.	5 4 3 2 1
5 4 3 2 1	11. To make informed educational-occupational choices.	5 4 3 2 1
5 4 3 2 1	12. To develop worthy leisure time interests.	5 4 3 2 1
5 4 3 2 1	13. To integrate studies and interests throughout the school as a vital part of general education.	5 4 3 2 1
5 4 3 2 1	14. To provide vocational training for students who would not otherwise have this opportunity.	5 4 3 2 1
5 4 3 2 1	15. To develop an understanding of the nature and characteristics of technology.	5 4 3 2 1

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	16. To provide general all-around technical skill and knowledge.	5 4 3 2 1
5 4 3 2 1	17. To establish beliefs and values based upon the impact of technology and how it alters environments.	5 4 3 2 1
5 4 3 2 1	18. To develop attitudes and abilities in the proper use of tools, techniques and resources of technical and industrial systems.	5 4 3 2 1
5 4 3 2 1	19. To develop problem-solving skills relating to materials and processes.	5 4 3 2 1
5 4 3 2 1	20. To develop consumer knowledge and appreciation and use of industrial products.	5 4 3 2 1
5 4 3 2 1	21. To develop an insight into industry and its place in our culture.	5 4 3 2 1
5 4 3 2 1	22. To develop an understanding of our technical culture.	5 4 3 2 1
5 4 3 2 1	23. To provide prevocational experience of an intensified nature for those students interested in technical work.	5 4 3 2 1

[] PLEASE PLACE A CHECKMARK HERE IF YOU WOULD LIKE TO RECEIVE THE RESULTS OF THIS STUDY.

COMMENTS (Use back if necessary):

APPENDIX C

QUESTIONNAIRE TO INDUSTRIAL ARTS TEACHERS

A STUDY OF GOALS FOR INDUSTRIAL ARTS IN THE STATE OF NEBRASKA

The purpose of this study is to gather data that will be used to identify the perceived status and the desired future of industrial arts in the state of Nebraska. The collective data given by you will be shared with teachers and teacher educators in Nebraska in an attempt to identify a strategy to move to that desired future. The coding on this sheet is for record-keeping only. No effort will be made to identify individual respondents.

Introduction

The purpose of this survey is to compare the positions of industrial arts teachers, building principals, school board presidents, and teacher educators with respect to goals for industrial arts. Directions are provided which explain the nature of the information sought and instructions on how to respond. Please answer the questionnaire completely.

Please mail to:

Kennard G. Larson
P.O. Box 122
Peru State College
Peru, NE 68421

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code # ____

INDUSTRIAL ARTS PROGRAM GOALS

The purpose of this questionnaire is to determine the extent of importance the following statements have in your current industrial arts program and the extent of importance the following statements may have on your future program.

Please indicate the importance you place on each goal statement as industrial arts is currently taught in your program in the left column, and as it would ideally be taught in the future in the right column. Circle the number assigned to the position nearest your own. Please double-check the survey form to be certain that you have circled two responses for each item, one in the left column and one in the right column. Space is provided at the end for personal comments.

KEY:
5. VERY IMPORTANT PROGRAM GOAL
4. IMPORTANT PROGRAM GOAL
3. MODERATELY IMPORTANT PROGRAM GOAL
2. SLIGHTLY IMPORTANT AS A PROGRAM GOAL
1. NOT A PROGRAM GOAL

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	1. To develop handyman activities; adjusting and making minor repairs to the industrial products used within the home.	5 4 3 2 1
5 4 3 2 1	2. To develop creative solutions to present and future societal problems using technical means.	5 4 3 2 1
5 4 3 2 1	3. To develop an understanding of the application of science and mathematics.	5 4 3 2 1
5 4 3 2 1	4. The promotion of proper habits of safety and health in relation to work habits.	5 4 3 2 1
5 4 3 2 1	5. To discover and develop creative technical talents in students.	5 4 3 2 1

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	6. To explore and develop human potentialities related to responsible work, leisure, and citizenship roles in a technological society.	5 4 3 2 1
5 4 3 2 1	7. To discover interests and aptitudes through trial experiences and first-hand study.	5 4 3 2 1
5 4 3 2 1	8. To gain knowledge of the changes in materials required to meet the needs of society, to understand industrial processes and to become familiar with the products of industry.	5 4 3 2 1
5 4 3 2 1	9. To appreciate good workmanship and design.	5 4 3 2 1
5 4 3 2 1	10. To understand and appreciate the evolution and relationships of society and technical means.	5 4 3 2 1
5 4 3 2 1	11. To make informed educational-occupational choices.	5 4 3 2 1
5 4 3 2 1	12. To develop worthy leisure time interests.	5 4 3 2 1
5 4 3 2 1	13. To integrate studies and interests throughout the school as a vital part of general education.	5 4 3 2 1
5 4 3 2 1	14. To provide vocational training for students who would not otherwise have this opportunity.	5 4 3 2 1
5 4 3 2 1	15. To develop an understanding of the nature and characteristics of technology.	5 4 3 2 1

IMPORTANCE TO PRESENT GOALS	INDUSTRIAL ARTS PROGRAM GOALS	IMPORTANCE TO FUTURE GOALS
5 4 3 2 1	16. To provide general all-around technical skill and knowledge.	5 4 3 2 1
5 4 3 2 1	17. To establish beliefs and values based upon the impact of technology and how it alters environments.	5 4 3 2 1
5 4 3 2 1	18. To develop attitudes and abilities in the proper use of tools, techniques and resources of technical and industrial systems.	5 4 3 2 1
5 4 3 2 1	19. To develop problem-solving skills relating to materials and processes.	5 4 3 2 1
5 4 3 2 1	20. To develop consumer knowledge and appreciation and use of industrial products.	5 4 3 2 1
5 4 3 2 1	21. To develop an insight into industry and its place in our culture.	5 4 3 2 1
5 4 3 2 1	22. To develop an understanding of our technical culture.	5 4 3 2 1
5 4 3 2 1	23. To provide prevocational experience of an intensified nature for those students interested in technical work.	5 4 3 2 1

IT IS VERY IMPORTANT THAT YOU COMPLETE SECTION II, ON NEXT PAGE, ALSO. THANK YOU.

SECTION II

This section is to obtain some specific information about you and your program characteristics. Please circle the number of the response which is closest to your particular situation. Be sure all nine (9) items are completed. Personal comments are welcomed.

1. Your industrial arts teaching assignment this semester.

   For each grade level, circle the number of periods you teach.

GRADES	NUMBER OF PERIODS
7	0 1 2 3 4 5 6
8	0 1 2 3 4 5 6
9	0 1 2 3 4 5 6
10	0 1 2 3 4 5 6
11	0 1 2 3 4 5 6
12	0 1 2 3 4 5 6

2. Education - highest level attained:
   1. BACHELORS
   2. MASTERS
   3. MASTERS +30 HOURS
   4. EDUCATION SPECIALIST
   5. DOCTORATE

3. Years of teaching industrial arts in grades 7 through 12.
   1. 0-4 YEARS
   2. 5-9 YEARS
   3. 10-14 YEARS
   4. 15 YEARS OR OVER

4. Status of your teacher certification in industrial arts.
   1. FULLY CERTIFIED
   2. PROVISIONALLY CERTIFIED
   3. NOT CERTIFIED

[] PLEASE PLACE A CHECKMARK HERE IF YOU WOULD LIKE THE RESULTS OF THIS STUDY.

COMMENTS (use back if necessary):

5. Membership in national professional industrial education associations.
   1. none
   2. ITEA (AIAA)
   3. AVA
   4. EPT
   5. other _____

6. Membership in state professional industrial education associations.
   1. none
   2. NIEA
   3. NVA 4. other_____

7. Your age:
   1. 21-30 YEARS
   2. 31-40 YEARS
   3. 41-50 YEARS
   4. 51-60 YEARS
   5. OVER 60 YEARS

8. Where did you receive your bachelors degree?
   1. CHADRON STATE
   2. KEARNEY STATE
   3. PERU STATE
   4. WAYNE STATE
   5. UNIV OF NEBRASKA
   6. OUT OF STATE

9. Where did you receive your masters degree?
   1. CHADRON STATE
   2. KEARNEY STATE
   3. WAYNE STATE
   4. UNIV OF NEBRASKA
   5. OUT OF STATE
   6. none

APPENDIX D

EXEMPLARY STATISTICAL ANALYSES

Table D-1

Exemplary Analysis of Variance for Research Question One

Item 1, Present Perspective					
Source	D.F.	Sum Sq.	Mean Sq.	F Ratio	F Prob.
Between Groups	3	49.9696	16.6565	14.68	0.0000
Within Groups	1107	1255.3661	1.1340		
TOTAL	1110	1305.3357			

Position	Count	Mean	S.D.	S.E.
Teachers	537	3.5891	1.0690	0.0461
Principals	390	3.3519	1.0742	0.0543
School Board	160	3.0875	1.0118	0.0800
Educators	23	2.6087	1.1575	0.2414
TOTAL	1111	3.4132	1.0842	0.0325

Table D-2

Exemplary Analysis of Variance for Research Question Two

Item 1, Present Perspective					
Source	D.F.	Sum Sq.	Mean Sq.	F Ratio	F Prob.
Between Groups	2	42.2981	21.1490	19.598	0.0000
Within Groups	794	856.8311	1.0791		
TOTAL	796	899.1292			

Position	Count	Mean	S.D.	S.E.
Teachers	327	3.7055	1.0666	0.0589
Principals	322	3.3634	1.0177	0.0567
School Board	147	3.0952	1.0266	0.0843
TOTAL	796	3.3546	1.0630	0.0377

Table D-3

Exemplary Analysis of Variance for Research Question Three

Item 3, Present Perspective					
Source	D.F.	Sum Sq.	Mean Sq.	F Ratio	F Prob.
Between Groups	1	3.5835	3.5835	2.602	0.1087
Within Groups	160	220.3352	1.3771		
TOTAL	161	223.9187			

Position	Count	Mean	S.D.	S.E.
Teachers	97	3.3590	1.1218	0.1136
Principals	64	3.0556	1.2451	0.1547
TOTAL	162	3.2378	1.1782	0.0925

Table D-4

Exemplary Crosstabulation of Members and Nonmembers of State Professional Organizations

Item 1, Present Perspective Frequency Row Pct Col Pct Tot Pct	Nonmember	Member	TOTAL
Not a Goal	37 49.2 17.4 9.4	38 50.8 21.1 9.7	75 19.1
Program Goal	174 55.2 82.6 44.6	141 44.8 78.9 36.2	315 80.9
TOTAL	211 54.1	179 45.9	390 100.0

Chi-square = 0.86150
Critical value of Chi-square at the .05 level = 3.84
Degrees of freedom = 1 Prob = 0.3533

Table D-5

Exemplary Crosstabulation of Industrial Arts Teachers by Source of Bachelors Degree

Item 3, Present Perspective							
Frequency Row Pct Col Pct Tot Pct	Chadron	Kearney	Peru	Wayne	Univ	Out of State	TOTAL
Not a Goal	10	21	12	9	6	23	81
	12.5	26.2	14.3	10.6	7.5	28.9	22.7
	38.3	19.7	20.3	17.2	10.1	42.0	
	2.8	5.9	3.2	2.4	1.7	6.5	
Program Goal	16	86	45	41	54	32	275
	5.9	31.2	16.5	15.0	19.7	11.7	77.3
	61.7	80.3	79.7	82.8	89.9	58.0	
	4.6	24.2	12.8	11.6	15.2	9.0	
TOTAL	26	107	57	50	60	55	356
	7.4	30.1	16.0	14.0	16.9	15.6	100.0

Chi-square = 22.40547
Critical value of Chi-square at the .05 level = 11.070
Degrees of freedom = 5 Prob = 0.0004

Table D-6

Exemplary Crosstabulation of Industrial Arts Teachers by Source of Masters Degree

Item 12, Present Perspective

Frequency / Row Pct / Col Pct / Tot Pct	Kearney	Wayne	Univ	Out of State	None	TOTAL
Not a Goal	7	5	12	5	50	79
	9.1	6.4	14.7	5.8	64.0	22.5
	12.6	20.2	26.9	23.9	24.4	
	2.0	1.4	3.3	1.3	14.4	
Program Goal	50	20	31	15	156	272
	18.4	7.3	11.6	5.4	57.4	77.5
	87.4	79.8	73.1	76.1	75.6	
	14.2	5.6	9.0	4.2	44.5	
TOTAL	57	25	43	19	206	350
	16.3	7.1	12.3	5.5	58.9	100.0

Chi-square = 4.24527
Critical value of Chi-square at the .05 level = 9.488
Degrees of freedom = 4 Prob = 0.0004

Table D-7

Exemplary Crosstabulation of Industrial Arts Teachers by Teaching Load

Item 1, Present Perspective Frequency Row Pct Col Pct Tot Pct	Number of Periods 1 to 3	4 to 6	7 or More	TOTAL
Not a Goal	41	56	19	116
	35.7	48.3	16.1	24.0
	36.3	25.4	12.6	
	8.6	11.6	3.9	
Program Goal	73	164	130	367
	19.8	44.8	35.4	76.0
	63.7	74.6	87.4	
	15.0	34.1	26.9	
TOTAL	114	220	148	482
	23.6	45.7	30.7	100.0

Chi-square = 20.31752
Critical value of Chi-square at the .05 level = 5.991
Degrees of freedom = 2 Prob = 0.000

Table D-8

Exemplary Crosstabulation of Industrial Arts Teachers by Level of Education

Item 1, Present Perspective Frequency Row Pct Col Pct Tot Pct	Bachelor	Masters	Mast.+ 30	EDS	TOTAL
Not a Goal	27	21	11	15	75
	36.4	28.4	14.9	20.3	19.1
	12.0	22.0	23.4	80.9	
	7.0	5.4	2.8	3.9	
Program Goal	200	75	36	4	315
	63.4	23.9	11.5	1.1	80.9
	88.0	78.0	76.6	19.1	
	51.3	19.3	9.3	0.9	
TOTAL	227	96	47	19	390
	58.3	24.8	12.2	4.8	100.0

Table D-9

Exemplary Crosstabulation of Industrial Arts Teachers by Level of Experience

Item 1, Present Perspective Frequency Row Pct Col Pct Tot Pct	Bachelor	Masters	Mast.+ 30	EDS	TOTAL
Not a Goal	13	15	18	30	75
	16.9	19.6	23.6	39.8	19.1
	18.4	22.5	19.4	18.0	
	3.2	3.8	4.5	7.6	
Program Goal	56	50	73	136	315
	17.7	16.0	23.2	43.1	80.9
	81.6	77.5	80.6	82.0	
	14.3	12.9	18.8	34.8	
TOTAL	69	65	91	165	390
	17.6	16.7	23.3	42.4	100.0

Chi-square = 0.65170
Critical value of Chi-square at the .05 level = 7.815
Degrees of freedom = 3 Prob = 0.8845

Table D-10

Exemplary Crosstabulation of Industrial Arts Teachers by Age in Years

Item 1, Present Perspective Frequency Row Pct Col Pct Tot Pct	Age in Years 21-30	31-40	41-50	51-60	TOTAL
Not a Goal	13	27	15	20	75
	16.9	35.8	20.3	27.0	19.1
	21.6	15.3	14.0	41.6	
	3.2	6.9	3.9	5.2	
Program Goal	46	148	93	28	315
	14.6	47.0	29.5	9.0	80.9
	78.4	84.7	86.0	58.4	
	11.8	38.0	23.8	7.3	
TOTAL	59	175	108	48	390
	15.0	44.9	27.7	12.4	100.0

Chi-square = 19.48692
Critical value of Chi-square at the .05 level = 7.815
Degrees of freedom = 3 Prob = 0.0002

Table D-11

Exemplary Mean Comparison and Related t-Test between Present and Future Perspectives of Goal Ratings for Industrial Arts Teachers in Large Junior High Schools

Item 1 (Present) With Item 1 (Future)

Mean	S.D.	S.E.	Mean Diff.	S.D. Diff.	S.E. Diff.
3.2258	1.023	0.184	.4156	.995	.179
3.6774	0.832	0.149			

Calculated Value of t = 2.53 Prob = 0.017
Critical value of t at the .05 level = 2.042
Degrees of freedom = 30 No. of Cases = 31

APPENDIX E

LETTER OF AUTHORIZATION

Bethel College North Newton, Kansas 67117 (316) 283-2500

17 October 1986

Mr. Kennard Larsen
Dept. of Industrial Technology
and Education
Peru State College
Peru, NE 68421

Dear Mr. Larsen:

I am pleased that you might find use for the instrument used in my dissertation research. You certainly have my permission to use the instrument as a basis for your research effort in Nebraska. Good luck on the dissertation.

Sincerely,

Rodney Frey, Ph.D
Assoc. Professor of
Industrial Arts

RF/rs