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An analysis of Area Interests and Employment Projections with a Recommended Program of Study and Educational Specifications for an Area Vocational Center For San Juan County, Utah

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AN ANALYSIS OF AREA INTERESTS AND EMPLOYMENT PROJECTIONS WITH A RECOMMENDED PROGRAM OF STUDY AND EDUCATIONAL SPECIFICATIONS FOR AN AREA VOCATIONAL CENTER FOR SAN JUAN COUNTY, UTAH

by

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by

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The purpose of this paper is to investigate the needs of San Juan County, Utah, in regard to an overall program of vocational education including ancillary services and new facilities for an area vocational center. Literature was reviewed concerning the need for vocational education, recent developments and trends in vocational programs, and other refinements in educational theory which influence instruction. Several groups of people were surveyed to determine the needs and interests of area residents with special attention given toward the Navajo Indian population.

The overall program which was developed incorporates aspects of the career education theme as it relates to vocational awareness and exploration. Suggestions are made regarding ancillary services such as counseling, inservice training, advisory committees, and promotion.

Part II of the study is the educational specifications for a new building to house the vocational program which was developed. Facilities for programs in mobile units are also included.

(279 pages)

PART I

THE ROLE OF VOCATIONAL EDUCATION AND AN ANALYSIS OF FACTORS PERTINENT TO PROGRAM PLANNING

CHAPTER I

INTRODUCTION

The system of public education should assume the responsibility for every student's preparation to move on to a next step, whether that be further study or entry into the world of work. Today, education must introduce youth to the world of work as well as to the world of ideas, since too few youth have the opportunity to learn about the myriad types of occupations through direct experience. Occupational education must be an important phase of the process of education. It should be concerned with all the capacities of each person--manipulative, intellectual, creative, and social.

Educational programs designed to meet the manpower needs of society need to be planned in accordance with current and future employment trends. A look to the future underscores the fact that *change* will be a keyword in determining our educational and manpower requirements for tomorrow. No one should support dead-end programs which train students for a specific occupation or skill which may disappear in the near future. Occupational education must be flexible to allow students to train or retrain as skills become obsolete or as ambitions grow.

Over the past several years, considerable progress has been made in providing increased opportunities for youth and adults to train for employment. Increasing attention has also been given to providing secondary students with information about careers, jobs, and employment.

Yet today, in a society oriented to better education, one out of five students still does not finish high school, and only one in four graduates from a four-year college. Most of the school curriculum (particularly

high school) is still structured as though everyone is preparing for a career which requires a four-year college education (Kunzman, 1970).

School life has largely been separated from real life, from real work, and from real community service. The present approach to universal education has tuned out many young people. Bored, restless, disenchanted, they seek alternate (sometimes destructive) avenues to fulfill their innate desires for accomplishment.

While the gains in providing career education have been significant, there is still a major dilemma in arriving at a comprehensive program. The problem involves essentially two questions:

1. How can secondary schools become preparatory institutions for *all* students?

2. How can the curriculum be related to the life goals of students so that they are motivated while in school and also equipped to choose the direction they will take after high school?

The public school system is responsible for providing every young person with the educational opportunities that will help him to develop his full potential. This means that schools have a three-fold task: (1) help students discover their individual interests and abilities, (2) help them explore many avenues of productive activity that might challenge and enlarge their talents, and (3) help them learn the wise exercise of responsibility and freedom of choice. Because friendships, life style, community service, leisure time, and family life are all vitally affected by career choice, "career consciousness" should pervade the teaching and learning environment (Kunzman, 1970). Giving a new look and emphasis to "career" education will help to solve the problems that have been outlined. The stigma attached to vocational education has prevented

it from attaining its rightful place in the scheme of instruction. To keep pace in world society, it is necessary to plan and implement vital and vigorous programs that will train and place people who can contribute to civilization in their sphere of interest and intrigue. This is the calling of education in general and the inescapable duty of vocational education in particular.

While it is becoming increasingly apparent that occupational education is a necessary and integral aspect of a total program of education, San Juan County, Utah, presents problems which are unique and which more strongly indicate the necessity of offering programs of occupational education. Of particular concern are the Navajo Indians. San Juan County is reported to have the highest percentage of county population on welfare of any county in the state of Utah. This relates directly to the fact that the Navajo Indians make up most of the group receiving welfare assistance. Since approximately 95 percent of the recipients in the county are Indian (Shumway, 1971), it is apparent that the Indians are not competing successfully in the economic life of the county. It is assumed that their plight is related directly to their educational deficiencies although the remoteness of the area has precluded the establishment of industry in the immediate vicinity, thereby reducing the occupational opportunities. It should be noted, however, that a trained labor force attracts industrial development and such training may very well provide the stimulus necessary to attract industry and the resulting supportive services. Residents of the county who desire occupational education are usually restricted to schools within the county because of the isolated location of the area. These concerns indicate the need to establish programs of occupational education at the secondary

schools of the county to serve high school students, adults, and other groups as necessary.

Statement of the Problem

Studies conducted by several agencies (Nichols, 1969; Sterling Institute, 1969; Utah State Board of Education, 1969) recommended the development of an area vocational school to serve San Juan County. Although the recommendations had been made, no systematic study had been undertaken to develop a contemporary program of education with an emphasis on vocations to specifically relate to the mixed population of the area nor to plan adequate facilities to house such a program.

Purpose of the Study

The purpose of the study was to develop the program of occupational education and ancillary services, and to establish the educational specifications for the new facilities for an area vocational center.

The specific objectives were to develop solutions to the following questions:

1. What are the types of training desired by county residents and what is the potential number of people to be trained?
2. What are the projected job opportunities in the county, state, region, and nation for persons who have received training?
3. What should be the specific elements of a curriculum for occupational education and what modifications will be necessary to meet the needs of the Indians and other academically or socio-economically handicapped groups?
4. What will be the building and equipment requirements and the operational costs of the recommended programs?

5. What are the financial resources available and how will they reflect upon the size of the building, the amount and types of equipment, the number of programs to be offered, and the operational expenses of the overall program?

6. What ancillary services will be required, particularly in the form of counseling, recruitment, inservice training, placement, and program evaluation?

Procedure

In order to obtain sufficient information on which to base recommendations for the program to be offered, the following procedures were necessary:

1. Review previous studies of the area to obtain the benefit of their insight and to combine elements relative to the planning process.

2. Conduct surveys of county residents (high school students, alumni, school district teachers and administrators, adults, and employers) to determine local interests and needs.

3. Review information relative to the occupational outlook and projected job opportunities in the county, state, region, and nation.

4. Review literature to determine current recommendations for programs of occupational education.

5. Study vocational programs and facilities at other schools in and out of state to obtain ideas and suggestions for planning.

6. Analyze and synthesize the results of the local surveys, compared with occupational projections, to arrive at recommendations for the most realistic program offerings.

7. Develop the proposed program of occupational education for the county giving due consideration to the input from a citizen's advisory

committee, the local district administration and faculty, the local board of education, and the State Specialists of Vocational Education.

8. Make recommendations for the site of the new construction giving consideration to existing buildings, space requirements, aesthetics, public opinion, and recommendations of informed persons.

9. Make recommendations for counseling, inservice training, and other ancillary services throughout the educational program of the school district as it relates to the program of occupational education.

10. Make recommendations concerning the administrative organization of the vocational program.

11. Develop the educational specifications for the new building and equipment.

Definition of Terms

Area vocational school or center. A school or program involving a large geographical territory usually including more than one local basic administrative unit. If offers specialized training to high school students who are preparing to enter the labor market. It also provides vocational or technical education to persons who have completed or left high school and are available for full-time study. These schools are sponsored and operated by local districts or by the state (American Vocational Association, 1971).

Occupational education. An organized sequence of learning experiences on a regular or systematic basis consisting of occupational theory, practice, and skill development for students (American Vocational Association, 1971). (In this report, it is used synonymously with vocational education.)

CHAPTER II

REVIEW OF LITERATURE

Many advances in educational theory and instructional paraphernalia have an effect upon program planning. These advances must be studied to more adequately fulfill the requirements of program development which will meet present and future needs. Some of the questions pertinent to this study include: What are contemporary views on the importance of vocational education?, What are the recent developments and trends in vocational education?, and What other recent developments will influence the program? In answer to the latter question, a review of literature indicated that the following elements should be influential: the issue of relevancy and accountability, learning activity packets, the area vocational school concept, and trends in facility design and construction.

The proposed program in Chapter IV is an attempt to reflect these influencing factors coupled with the results of occupational projections and community surveys.

Vocational Education: A Requisite for Success?

America has progressed to a point where a college education is seemingly expected of everyone whether or not he or she may adequately benefit from it. Many of those enrolled should not be there, will not graduate, and will become frustrated by the experience. But the typical high school today prepares a student either for college or for nothing at all.

Students who are interested in vocational education or further training in technical fields are snubbed and viewed as second-class citizens in too many cases. That nearly every student will be required to have some education in his area of interest is assured--the day of the common laborer with no training is nearly at an end. A publication of the American Vocational Association states:

> It's been almost 200 years since Ben Franklin told his fellow Americans that a man who has a trade has an estate. Today, a man without a trade hardly has a chance. Warm young bodies and strong young backs are no longer adequate resources for competing in an economy where automation and computerization have taken over most of the repetitive work formerly done by people without special skills and knowledge. (American Vocational Association, 1968, p. 3)

A report by the U.S. Office of Education (1969, p. 1) suggests that many of the most vexing dilemmas of the nation have resulted from changes in the nature of work. Old jobs disappear or become altered while new ones with new training requirements emerge. "Jobs for which physical strength and untrained minds were sufficient have declined, while jobs requiring perfected skills and advanced education have increased."

Max Rafferty says:

> It's true that unskilled labor is fast becoming a drug on the market, but the exact opposite is true of skilled labor. We're going to be needing a whole lot more of the latter as the future comes gradually into focus, flashing with computers and clicking with atomic by-products, and we're not going to get it by sneering loftily at every occupation which might require Junior to get his hands dirty from time to time. (Rafferty, 1970, p. A10)

The First Annual Report of the National Advisory Council on Vocational Education suggests that "the violence which wracks our cities has its roots in unemployment and unequal opportunity." (Department of

Health, Education, and Welfare, 1969, p. 1) The report further attributes the problem to inadequate education which requires young men and women to enter the job market without the skills and attributes which employers require--high school graduates inadequately prepared for anything.

The students without training who do find jobs normally end up in low-skill, low-pay jobs, without security or future, and far below their occupational potential. This leads to an astonishing paradox; on the one hand there is one of the highest unemployment rates in history, while on the other hand there are numerous unfilled job opportunities in fields which require technical training. While college enrollment soars, 80 percent of the jobs, although requiring specialized training, do not require a college degree--nor will they in the foreseeable future (Education for Jobs, 1971; Adams, 1970; Cunniff, 1970). Skilled workers are needed particularly in appliance and automobile repair. In the latter case the number of vehicles has increased 100 percent in the last 20 years and each model-year presents more complex gadgetry. In this same length of time the number of mechanics has increased only 20 percent. Because of the scarcity of repairmen, Americans discard repairable items worth 20 billion dollars annually (Wills, 1970). Of increasing importance is the fact that many of these items add to our landscape pollution and also further deplete our valuable resources of metals, fuels, and fibers.

But very few parents encourage their children to become mechanics, plumbers, or repairmen. Why? Rafferty (1970, p. A-10) attributes a major portion of the declassé image of vocational education to the "lower class" parent. He suggests that while the father's family has been laborers for generations, he will be "eternally ding-donged" if

his son is going to be a laborer too. "Junior is going to college and be a doctor, lawyer, or business tycoon." Another article (Expand Vo-Ed, Utahn's Agree, 1971) blames the problem on the public attitude which accords more prestige to academic achievement. It is frequently the parents who themselves have achieved successful and rewarding careers in the "vocations" who insist that *their* children attend the more prestigious four-year institutions. Another part of the problem is that counseling services are generally weak because counselors are academically oriented.

The Report of the National Advisory Council on Vocational Education (Department of Health, Education, and Welfare, 1969) ascribes three main causes to the problem: attitude, program, and money. Of *attitude* they say that the very heart of the problem is a national attitude that says vocational education is for somebody else's children. The idea has been promoted that the only good education is that capped by four years of college. The attitude further infects the federal government, which invests $14 in the nation's universities for every $1 it invests in vocational education programs; the state governments, which likewise invest far more in universities and colleges than in support of skill training; and the school districts, which concentrate on college preparation in "reckless disregard" of the 60 percent of students whose only transition to the world of work is their high school experience.

The *programs* decried by the Council are the traditional "separate vocational school" pattern and the "vocational track" pattern. These patterns tend to restrict the flexibility which would be available to the students and also contribute to the "image" problem. The Council also suggested that a full range of post-high school programs should be available to those who leave the twelfth grade or earlier without having

acquired a job skill. They must have access to programs which will train them to their highest potential.

The problem of *money* is somewhat of a paradox. While vocational education is more expensive than preparing students for college, "educating youth for employment costs less than educating them for the college they will never reach and providing remedial training thereafter." The problem is brought into focus when it is realized that the federal government spends nearly $4 in remedial manpower programs for every $1 it invests in preventative vocational programs (Department of Health, Education, and Welfare, 1969, p. 3).

Society must overcome the stigma attached to vocational education and realize that any occupation is honorable which provides personal satisfaction to the individual and provides beneficial service to society (Berg, 1971). In the same sense that a doctor needs more than a stethescope to practice medicine, a person needs more than a hammer to be a carpenter and more than a pair of pliers to be a mechanic. Training is a necessity for proficiency in any field of endeavor. People are as likely to require competence in their plumber as in their dentist (Williams, 1970).

The U.S. Commissioner of Education, Sidney Marland, an advocate of vocational education, has said:

> " . . . One of the goals to which education must direct itself is to give every student the chance to acquire the skills that will equip him to make a good living for himself and his future family, no matter at what level of the educational system he leaves school. No young person should leave our secondary schools without the readiness to enter higher education or the world of work. I believe there is no "in-between." (Marland, 1971a, p. 22)

In order to keep abreast of the job opportunity demands in technical areas and the number of young people involved, by 1975 14 million youth should be receiving some kind of vocational-technical education. In 1968 there were only 3.8 million receiving such training in the secondary schools and nearly 25 percent of the young people who turn 18 each year do not have an education adequate for any type of employment (Adams, 1970).

In summary, Governor Rhodes of Ohio (1969) has made the following statements concerning the need for vocational education:

> Annually, our educational system turns out millions of unskilled and untrained graduates, and dropouts, into a work force that has no place for them. For most of our youth, the secondary school is their last chance for a full-time education; consequently, their preparation for a job must come during high school. Education must be made relevant, with deep concern for the total student; it must prepare each youth to graduate with a diploma in one hand and a job in the other. The alternative is clear--we either provide him with a job or fight him in the streets . . . . (p. 5)
>
> Of course education is expensive but it is not as expensive as noneducation. It is a fact that no nation ever went bankrupt educating its people . . . . (p. 6)
>
> . . . The unemployment rate among youth is staggering, and the reason they are unemployed is because they cannot sell anything that the labor market wants to buy . . . . (p. 9)
>
> . . . The solution rests in jobs, employment, and the security which these provide . . . . (p. 10)
>
> The challenge of the moment is to do something constructive about the preparation for youth to take their places in society . . . . (p. 11)
>
> There must be a job in every person's future! (p. 12)
>
> . . . Our educational system must provide, with equal dedication and honor, the study of art and typewriting, history and accounting, philosophy and plumbing, and vocational and nonvocational endeavors . . . . (p. 108)

Related concerns

While it is felt that a strong case has been made on the need for vocational education, it must be emphasized that vocational programs must also change from the traditional patterns to become the viable force which is required. Various authors and committees have suggested modes of implementation or have given guidelines on what must be included in an overall educational system.

The National Committee on Secondary Education (Draper, 1967) proposed 10 conclusions regarding the system of education. They suggested that the public educational system has an obligation to aid all young people in preparing for the world of work but that traditional definitions and requirements of vocational education must be modified and expanded. They further stated that vocational competence involves much more than what has traditionally been called vocational education and that emphasis on a specific skill development must be avoided. They see the comprehensive high school as being best able to provide this all-inclusive education.

Nerden (1970, p. 5) stated that vocational education is a part of total education, but other elements of education are also part of the needs of individuals in helping them to become fully functioning citizens in an industrial-technical society. The secondary student needs not only manipulative skills and associated technical knowledge, but also a broad background in English, social sciences, physical education, and health. The graduate of the secondary school should be prepared for an occupation and also equipped to "discharge the duties of effective citizenship on local, state, and national levels." This will require: (1) wide areas of vocational-technical education in

response to student needs, and (2) a high degree of articulation and integration among the elements of education.

In summary, while vocational programs are a necessary part of vital and vigorous educational programs, caution must be exercised in assuring that the system does not become overbalanced toward the vocational aspect. A balance must be maintained between the manipulative and technical skills which earn a living and the social and cultural skills which are necessary in job maintenance and life enjoyment.

Recent Developments and Trends in Vocational Education

One of the major challenges of education is to help develop human resources to cope with recent and future change. More specifically, this challenge rests with vocational educators to provide competent personnel, relevant programs, and adequate facilities collectively capable of: (1) fulfilling the vocational guidance needs of students on a K-12+ basis, (2) raising the level of employability of non-college-bound youth, and (3) allowing for initial and supplementary occupational training for the adult population (Sanders and Dennis, 1971).

A look to the future

In planning programs which must prepare students for the future, some insight is necessary into what is envisioned for the future, although the accuracy of such projections is open to question. Extensive research into this problem is beyond the scope of this report; however, a few brief comments are pertinent. The American Vocational Association sees the challenges of the '70's as:

> The international crises which will require a capable work force for survival.
>
> The technological revolution requiring new knowledge and skills.
>
> The growing population requires an increasing number of skilled and technical workers to produce goods and services.
>
> Changes in the labor force--more service workers, more mobility, more young people, and more women.
>
> Economic, social and political goals resulting from better transportation and communication, better education, and increased leisure.
>
> The continued population shift from rural to urban requiring adjustment to a new environment.
>
> The large number of unemployed youth--a socio-economic loss the nation cannot afford. (American Vocational Association, 1968, p. 5)

Striner (1967) projects into the decade of the '80's and suggests the following as influences upon educating for the world of work.

1. *Mobility.* The work force will be much more mobile, not only within the nation but between nations. This will involve all levels of workers.

2. *Work.* By 1984, 60 percent of the labor force will be in the service sector and 30 percent in the manufacturing sector. This compares with 55 percent and 35 percent, respectively, in 1967. The remaining 10 percent will be involved in mining, agriculture, or unemployed.

3. *Urbanism.* The rural-to-urban movement will continue, with the poor, less-educated classes moving to the inner city and more industry developing in the suburban rings.

4. *Education for work.* There will be much more extensive development of combined in-school and on-the-job training. There will also be a great increase of private schools specifically related to particular industries.

The American Council of Industrial Arts Supervisors states:

> It is difficult to predict what kind of world tomorrow will bring. The striking features of contemporary life are the explosive rate of technological change and increasing complexity of our social organization. With technological developments continually creating new jobs and rendering old ones obsolete, it becomes virtually impossible to predict the specific job a student in school today may be called upon to perform during his working adult life . . . .
>
> The educational challenge is clear. Teachers, administrators and counselors cannot and should not make career decisions for students. It is, however, the responsibility of educators to provide varied and realistic information and experiences which will help students develop their potentialities and plan wisely in light of all the knowledge that can be mustered about themselves and the world in which they will live and work. (American Council of Industrial Arts Supervisors, 1971, p. 6)

The occupational outlook and employment projections which must be a concern of programs of vocational education are examined in more detail in Chapter III.

A total program of education

This, then, leads into a discussion of how educators can provide the experiences and information which will help students develop their potentialities and make career decisions. Tyler emphasized that:

> One test of our success in educating the individual for self-realization is whether at the end of each year of education he has a wider range of realistic choices in life available to him. If he is being narrowly specialized to fit into a niche in life with a real possibility of very limited choices, he has been miseducated. Each year should open new doors for him and develop new abilities to enable him to go through these doors as he chooses . . . .
>
> One of the most significant changes in occupational education is based on the recognition that every child needs to learn things that will prepare him for the world of work, that what is to be learned is much more than certain specific vocational skills, and that appropriate educational experiences will need to extend throughout the school years. (Tyler, 1971, p. 60)

Feldman suggests that a truly comprehensive program of education must include provision for:

> 1. Identification of the talent and learning style of the individual;
> 2. The communication of physical and social knowledge about the world in which he lives;
> 3. Development of the skills the student needs to sustain and advance his life so that he may be a productive and creative individual in society;
> 4. The imparting of success to the individual's search for his own life values. (Feldman, 1970, p. 87)

He further proposes a program to accomplish these "objectives." He says that an effective comprehensive program should begin in the elementary school with development of individual personality, talent identification, and the acquisition of general knowledge. Throughout the elementary grades would be a continuing examination of how man uses work for self-support, and the relationship of work to abilities. A major objective in the elementary grades would be to help each child discover his own talents and relate them to the work world.

Vocational guidance would be introduced early in the middle-school years. The aim is to further acquaint the student with the workings of industry and commerce, to match talents with career objectives, and to help him see what adults who share his qualities do in society. The educational system would provide simulated or actual experiences relating his school studies to his special talents and interests.

The idea behind Feldman's plan is that vocational education is not to simply fit into the existing system, but rather to make it the *principal feature* of the system. He decries the track system which " . . . freeze[s] students within the confines of their class, race, and social group. It denies all groups the benefit of interaction and shared experiences." (Feldman, 1970, p. 88)

The high school program described by Feldman would have three major departments: theory and abstract knowledge, laboratories for validation of theory, and an applications department. The applications laboratories would be closely tied to occupational functions and could be either inside or outside the school.

The intent of the overall program is to help students achieve success. No student would be rejected outright at any stage of his education, although he might receive at least temporary redirection to more modest objectives if his career choice offered little probability of success. All students would have several options available to them upon leaving high school, including: job entry skills, further education in a two-year college or vocational technical school, or further education in a four-year college.

The significant aspect of Feldman's plan is that he views career choice and job preparation as a continuum beginning in elementary school and continuing through high school and beyond. Many others have made similar statements or proposed similar continuums, as witness the following statements:

> . . . Education that helps boys to prepare for employment really begins in the early grades, aiding them to develop a more realistic picture of the world of work and to perceive more clearly what characteristics are required for employment. In these early years, children can develop habits of responsibility, of thoroughness in work, of punctuality, as well as intellectual and social skills. In the junior high school period, career exploration and planning are important phases of the program. (Tyler, 1971, p. 63)

The American Council of Industrial Arts Supervisors (1971, p. 6) states that " . . . career decision is a long-term developmental process." They also state the following:

> Opportunities for educational, social, and occupational guidance exist at all levels of education and in all areas

> of the curriculum. . . . Information provided at the elementary school level is general in nature, while that at the secondary school is more specific . . . . (p. 12)
>
> It is in the elementary school where the development of positive attitudes toward work begins . . . . The work that children do in their assignments and school activities has a relationship to the work performed by adults in a wide range of occupations. (p. 13)
>
> [In junior high school] students are given opportunity to plan, experiment, and work in areas relating to many industrial-technical fields. . . . They can more wisely assess and understand their interests, abilities, limitations, and potentialities relating to industrial-technical pursuits. . . . Students need information which will help them formulate career goals based upon their growing knowledge of themselves. (pp. 13-14)
>
> The accumulated experience and maturity of high school students make them more ready to identify with certain occupational areas. Whereas the individual has, since elementary school, been eliminating various occupational choices as his self concept changes, he is now beginning to take a more positive look at certain occupations. (p. 14)

Career education

The most far-reaching concept embodying the K-12 continuum and the idea which has provided the basis for a wide variety of plans is the "Career Education" theme advocated by U.S. Commissioner of Education, Sidney P. Marland (1971b). His concept is that career education embraces vocational information, but goes a good deal further. Career education starts with the earliest grades and continues through high school and exposes the student to a wide range of career opportunities, helps him narrow his choice in terms of his own interests and abilities, and then provides him with an opportunity for education and training appropriate of his ambition. There are three main aspects to the concept:

1. Career education will be a part of the curriculum for *all* students.

2. Career education continues through K-12 and beyond.

3. Every student should possess the skills to earn a livelihood even if he leaves high school before completion.

Career education, according to Marland, involves the idea that a student cannot learn a job by reading a book; therefore, realistic work experiences should be provided for all young people. It encompasses considerably more than teaching specific skills. Aspects concerning the wide range of job possibilities, techniques of getting and holding a job, matching interests and abilities with a career, and job placement are all included. The approximately 20,000 different jobs are grouped within general clusters and during the elementary grades the students are made familiar with the clusters and what is involved for job entrance within the clusters. In grades seven and eight the student concentrates more on those clusters which are of particular interest to him. The ninth and tenth grades are spent in depth exploration of one or two job clusters, visits to work sites, and practical experiences duplicating as nearly as possible actual work experiences. The eleventh and twelfth grades are spent in a more intense pursuit of the student's selected job area in terms of three options: skills for job entrance, a combination of academic and job-training courses preparatory to entering a post-secondary institution, and courses specifically directed toward a four-year college.

Another necessary aspect is a refocusing of other classes in the basic subjects--mathematics, language arts, science, and social studies--to direct them more toward career interest. This makes those subjects more relevant and serves to motivate students who are normally less successful.

Marland (1971b, p. 26) suggests that this concept should heighten the intellectual quality of education because school work would become more meaningful and stimulating, resulting in higher motivation. "The more effective the schools are in capturing a youngster's curiosity and capitalizing on his interest, the more he will want to learn."

The career education model proposed by Commissioner Marland is being field tested (1972) in six school districts (Arnold, 1971).

The modified and validated model is scheduled to be ready for national dissemination after December 31, 1979. The clusters identified by the model are: business and office occupations, marketing and distribution occupations, communications and media occupations, construction occupations, manufacturing occupations, agri-business and natural resources occupations, marine science occupations, environmental control occupations, public services occupations, health occupations, hospitality and recreation occupations, personal services occupations, fine arts and humanities occupations, and consumer and homemaking-related occupations.

Meanwhile, other states such as Wyoming (Talagan, 1970), Oregon (Kunzman, 1970), Georgia (Cobb County Public Schools, 1971), North Carolina (Cochran, 1970), Arizona (Golden, 1972), and Utah (Warner et al., n.d.) have been developing a wide variety of materials centering around the career education theme.

Part of the business of the Annual Convention of the American Vocational Association held in Portland, Oregon, in December, 1971, was to formulate a recommended position regarding career education (Task Force Report on Career Education, 1972).

As a result of these recommendations, the American Vocational Association has adopted a stance in favor of the career education theme (Burkette, 1972). The net effect of this should be to provide another strong voice encouraging legislation and program development for career education, of which vocational preparation will be an integral part.

Dr. Edward Kabakjian, Executive Secretary of the American Industrial Arts Association, also favors the career education concept:

> The emphasis on career education which is supported by Commissioner of Education, Sidney P. Marland, may well be the kind of support and leadership our nation needs to move our schools off their academic pedestal and into the arena of reality. (Kabakjian, 1971, p. 8)

He cautions, however, that the pendulum must not swing so far toward career education that it has a detrimental effect on other worthy goals of education. He suggests the term, "career emphasis in education," as an alternative.

Relevancy-accountability

Another recent thrust which influences programming is the trend toward relevancy and accountability in education. Resnick and Levine, 1970, p. 91) couple the two concepts together, stating that while relevancy deals with the meaningfulness of an activity, accountability consists of evaluating activities to determine whether they perform in the intended manner. "Accountability is the measure by which relevancy can be assessed."

Feldman suggests:

> An educational program for the 70's must have "zero rejects" as its over-arching goal. No student should be allowed to fail; student potential must not go unrealized. Moreover, schools must be held accountable by students, their parents, and society for the achievement of this goal.

> A relatively new comprehensive system might provide a better educational program for more students of diverse ability. This lively renewal of American education could emerge out of vocational education, broadly conceived.
>
> Educators are afraid of the word "vocation." They send out students who have required "courses" to their credit, but no vocational sense. Until now our schools have been interested primarily in what happens to the student while he is still in the classroom. What happens to him after he leaves the classroom is regarded, more or less, as his own concern. The issue of accountability may well have its roots in this attitude.
>
> . . . Once a pupil's style is identified--and this ought to be the earliest years because it profoundly affects all future learning--then the style should become a central vehicle of his learning. (By contrast, most schools teach each subject in one style; hence they teach only those students whose style it happens to be. Result: students become branded failures when, in fact, it is the school that has failed.) (Feldman, 1970, p. 86-87)

Ralph Tyler (1971) also expresses concern over the irrelevancy of education and says that two of the new tasks of education must be to reach the disadvantaged and to make high school more effective for a large proportion of the population. He says that the most common complaint among high school students is the irrelevancy of the educational program. Many of the experiences *could* be relevant, but students cannot perceive the connection because school is separated from real life situations. This results in low interest and effort and eventually in drop-outs. Tyler suggests that a bridge is needed between school and outside persons and activities. This might be provided by cooperative education, community service projects, and other activities to involve students in joint participation with adults.

Learning activity packets

The current trend toward the development of self-instructional or individualized instruction materials will also have a decided effect on planning and program operation. Jelden (1972) describes learning

activity packets as total educational packages, not just laboratory manuals to be used as additional classroom activities. The packet consists of behavioral objectives, recommended sources of information, choices of sequence preferred by the student, self-evaluation integrated into the lesson, and a packet evaluation to allow the student to explain in his own words his understanding of the task or goal. Depending on the material under consideration, laboratory experiences may be provided, giving opportunities for practical application of the knowledge gained. There may be additional references for students who desire a deeper quest into the material. The packet evaluation may consist of an oral interview, a written essay test, a laboratory performance test, or any combination of these as expressed in the original behavioral objective.

In summary:

> A Learning Activity Packet is designed to provide the learner with a self-pacing, individualized, multi-media system of education. If properly designed and used it frees the teacher from highly structured classroom lectures and allows him to help guide the learning process of the students. (Jelden, 1972, p. 140)

The area vocational school concept

"One of the most significant contributions of the Vocational Education Act of 1963 is the authorization of federal funds for construction of area vocational-technical school facilities." (Russo, 1965, p. 28) The guidelines of the Act implied that the states would develop networks of area schools to serve all age groups.

An area vocational school is defined as a program which offers training in at least five occupational fields. This may be a department of a comprehensive high school, a separate vocational school, or a

division of a community college (Department of Health, Education, and Welfare, 1968). In areas of high population, several high schools may serve as feeder schools for a central vocational center. However, in rural areas distances often preclude the participation of several high schools in a single vocational center. Thus, an area vocational school constructed near a local high school serves mainly to increase the comprehensiveness of the high school.

White (1971, p. 189) states that while area vocational schools have had problems with administrative structure and general ambivalence, the concept is "here to stay, at least in the forseeable future." He suggests that the area school is an extension of the educational program of the community and cannot stand alone. The degree to which students receive adequate basic education and career information affects the degree to which an area vocational school can prepare him occupationally. The success of the area school requires revision of the regular curriculum, local financial support, and active community interest. White recommends four responsibilities of local educational leaders in the proper functioning of the area school:

1. *Accept* the area school as a full partner.
2. *Demand* that the school's program reflects occupational needs.
3. *Ensure* that enrollees have adequate preparation and guidance.
4. *Support* the concept throughout the educational community.

Facilities

While the program planned should dictate the facilities required, trends in construction, arrangement, layout, and size-shape requirements should be considered concurrently with program development to incorporate

the ultimate aspects of each if possible. Too, to avoid many of the problems previously associated with vocational programs, buildings associated with the world of work should dignify work and should be warm and friendly, yet businesslike (Farnsworth, 1967).

The facilities must provide the environment which will challenge youth and adults with the great opportunities in the technological fields (Larson, 1969b). The whole effect of the planning should be to remove the invisible tattoo of "labor" or "dropout" from the head of the student in vocational education (Mochon, 1970). Some of the newer planning concepts range from the "resort" concept which harmonizes with scenic surroundings to the "campus" concept which provides more of a college atmosphere, and from a "shopping center" approach with large glass windows to the windowless idea which offers better utilization of wall space and is more economical in construction and maintenance (Wenig, 1969). Carpeted classrooms, floating stairways, and attractive landscaping add to the pleasant and appealing atmosphere (Mochon, 1970).

Facilities for current and future programs of vocational education should make provision for new grouping techniques (ratios of from 1:1 to 1:100 or more), the use of a wide variety of media equipment, individualized instruction and experimentation, group projects and activities, a natural flow of materials, and ease of traffic flow between spaces and within spaces (Schmitt and Taylor, 1971). In a word, the key is *flexibility*. Large areas may be subdivided with folding doors, curtains, screens, or other dividers to accommodate a wide variety of activities. The facility should be flexible enough to adapt to changing occupational needs including expansion into new areas or

alternate programs in existing facilities. This involves "master-planning" of anticipated expansion to eliminate the "added-on" effect (Feirer, 1969). The clustered program approach is augmented by the clustered facility approach for more efficient traffic patterns and an integrated-correlated program (Larson, 1969b).

There should also be provision for the utilization of new time frames such as flexible scheduling, non-graded programming, and year-round schools (Larson, 1969b). Such provision may require more accurate environmental control of heat, lighting, acoustics, and humidity. Some programs such as home economics or crafts should have convenient access to pleasant outdoor areas (Taylor and Christian, 1965).

While efficient functioning and flexibility of anticipated construction is a paramount concern, this should not detract from the beauty which can be incorporated into the design. Functional buildings need not be sterile and drab; however, excessive "frills" dramatically increase construction and maintenance costs.

Summary

Vocational education is viewed by many people as one of the answers to many of the nation's most perplexing problems. An effective program would involve a total program of education directed toward the world of work and including experiences in a continuum from kindergarten through twelfth grade with a progressively increasing function of guidance and job preparation. The program of career education advocated by the Commissioner of Education, Sidney Marland, and others is viewed as one

example of a realistic program of orientation, exploration, and preparation for careers. This concept has received support from the American Vocational Association and the American Industrial Arts Association.

Vocational education may well be one of the major elements in making education more relevant for young people, thus serving as a motivational factor to encourage more interest in school and thereby decreasing discipline and dropout problems.

Along with other educational programs, vocational education is fertile ground for development and utilization of new instructional modes such as learning packets, media hardware and software, self-instructional techniques, and group activities. Instructional personnel are limited only by imagination in utilizing effective and efficient instructional techniques.

The concept of the area vocational school received emphasis with the Vocational Education Act of 1963 which provided funds for construction and equipment. Such a school may be a separate school fed by several high schools or it may consist of five or more vocational programs in a department of a comprehensive high school.

The key word in designing facilities to house programs for the future is *flexibility*. Provision should be allowed for expansion, for multiple use of spaces, and for adaptability to advances in technology, or changes in educational theory.

CHAPTER III

SURVEY OF COMMUNITY NEEDS AND OCCUPATIONAL PROJECTIONS

Characteristics of San Juan County

Geographic and population considerations

Geographical description. San Juan, the largest county in Utah, is an unusually scenic area comprising 7,884 square miles in the southeast corner of the state. The county is Utah's segment of the Four Corners country, the only place in the United States where four states have a common corner. Altitudes range from an elevation of 3,160 feet where the Colorado River crosses into Arizona to the 12,721-foot Mt. Peale in the LaSal Mountains in the northeast corner of the county.

The county is endowed with many interesting characteristics. In the southwestern corner, Navajo Mountain, at 10,416 feet, stands nearly a mile above the surrounding plateau. The area north of the San Juan River between the Blue Mountains and Lake Powell is divided into two distinct geographical areas by a sharply defined fault, Comb Ridge. West of the Ridge are deep, colorful gorges; east of it are rolling hills with numerous gullies and washes of lesser size and with fewer scenic qualities. Both the LaSal and Blue Mountain areas have cool, timber-covered slopes that rise above the eroded formations of the plateaus.

Climate. The climate of San Juan County is basically dry and sub-humid, except at higher elevations. The seasons are well defined, with a wide range of daily temperature--some of which is due to elevation. Average annual precipitation ranges from 9 inches in the northern part

of the county to 12 inches in the Blanding area. Many of the storms come in the form of cloudbursts which have very few beneficial results. Some areas of the county are harrassed by dry, southwestern winds which are more prevalent in the spring and early summer.

The climate is conducive to various types of agricultural pursuits which provided the basis of the early economy. The area east of Monticello is known as the "Pinto Bean Capital of the World." Thousands of acres are also devoted to dry-farm wheat.

The pleasant summer days, cool evenings, and clear atmosphere are also viewed as a distinctive advantage for the anticipated tourist trade.

Economy. The economy of the county was based on sheep, cattle, and farming for approximately 65 years after its settlement in the 1880's. After World War II, however, the discovery of uranium and oil supplanted agriculture as the principle economic factor. The growth in income from mining has enabled the county to build modern schools, libraries, and water treatment plants, and to greatly improve the desirability of living in the communities. Since the early 1960's, with the decline of mining activity, the county has turned increasingly to the development of tourism as a supplement to the economy.

Further resources which have the potential for development with considerable effect on the economy are the huge amounts of coal and oil shale and lesser amounts of crude oil and natural gas under the Colorado Plateau which occupies the center of the Four Corners Region. Some geologists regard this as the greatest potential source of future fuels, supplanting the prominence of coal from the Appalachian Plateau and the

oil and gas fields of Texas and Louisiana (Westinghouse Electric Corporation, 1969).

Some of the basic factors which limit the economic development are aridity, terrain, and isolation. The amount of rainfall, previously mentioned, requires irrigation for most crops; however, beans and wheat are grown in dry-farm operations. The terrain of the area is a nightmare for highway engineers. This is shown by the fact that there are only two highway bridges and no railroad bridges across the Colorado River between Las Vegas, Nevada, and Moab, Utah. The isolation of the region is illustrated by the reality that a circle with a 500-mile radius around the Four Corners monument does not encompass any major metropolitan area other than those in the four states. This disqualifies the region from consideration as a location for many of the mass-consumption industries (Westinghouse Electric Corporation, 1969).

Population--past, present, and future. The population increased gradually between 1900 and 1950 to 5,300 persons. The decade of the '50's saw the mining and petroleum boom during which the population increased to 9,000 people. The decrease of mining activities during the early '60's caused a decrease of nearly 1,000 by 1966. Table 1 indicates the population of the county as projected to the year 2000.

Approximately one-third of the population of the county are Navajo Indians. Projections of future growth among the Indians indicate that this segment will grow at a faster rate than the white segment, so that by the year 2000 approximately one-half of the total population of the county will be Indian (Planning and Research Associates, 1968a).

The major population concentrations--exclusive of the Navajo Indians--are in the towns of Monticello (population 1,431 in 1970) and

Table 1. San Juan County population from the year 1900 to 2000

Year	Population
1900	1,023
1910	2,377
1920	3,379
1930	3,496
1940	4,712
1950	5,315
1960	9,040
1970	9,200
1980	10,000
2000	12,000

Source: Planning and Research Associates, 1968a, p. 5.

Blanding (population 2,250 in 1970). It is expected that these towns will double in size by the year 2000.

Educational considerations

Attendance areas and bus routes. San Juan School District currently has seven elementary schools: La Sal, Monticello, Blanding, Albert R. Lyman (formerly Park Terrace), Montezuma Creek, Bluff, and Mexican Hat. The District also supports two six-year high schools: Monticello High School and San Juan High School at Blanding. The attendance areas for the elementary schools are shown in Figure 1 and those for the high schools in Figure 2.

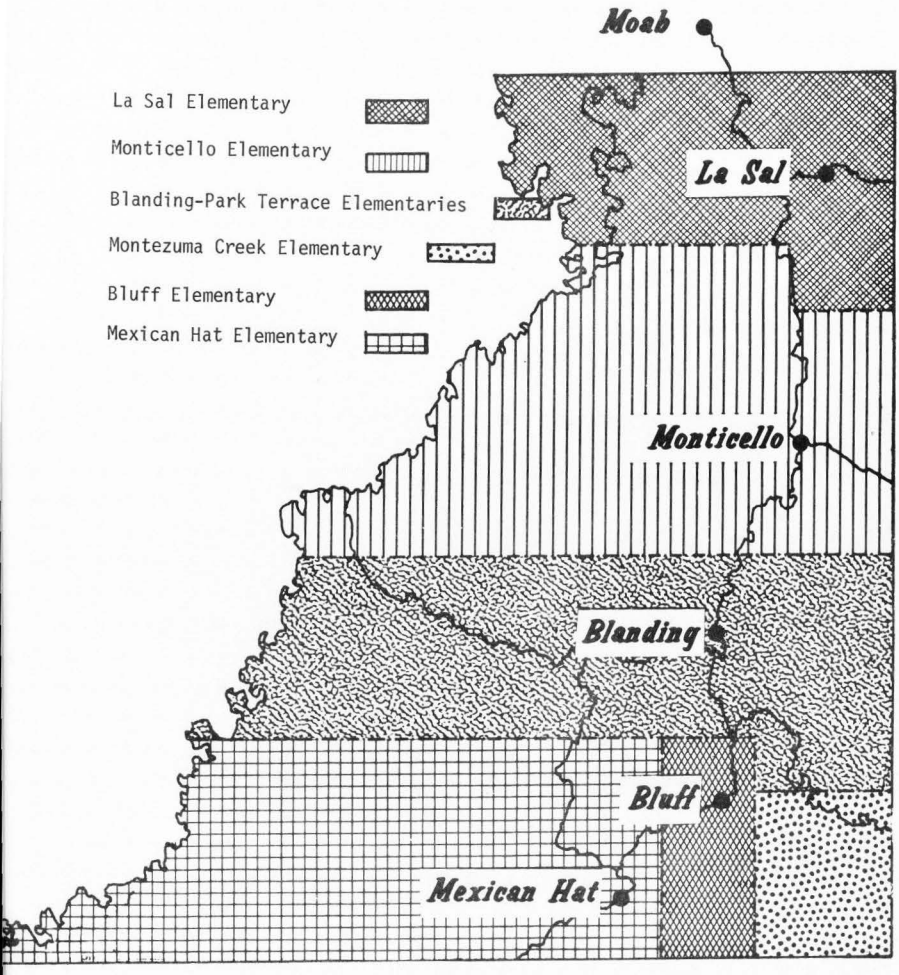


Figure 1. Elementary schools in San Juan School District.

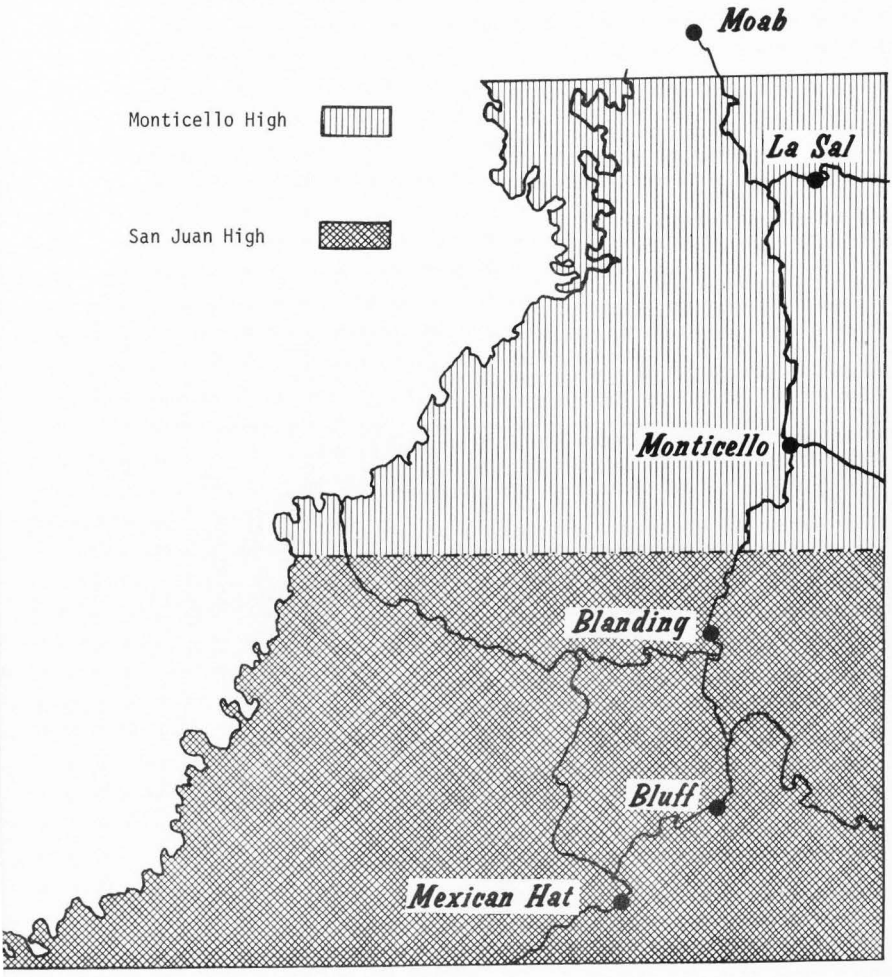


Figure 2. Secondary schools in San Juan School District.

Bus routes ranging to a one-way maximum of 50 miles in the north-county area and 70 miles in the south-county area make it obvious that transportation constitutes one of the very difficult problems in getting children (especially the Indians) to and from school. The participation in the education program is definitely affected by the problem.

Student population. San Juan County, as previously described, is the largest county in the State of Utah, and the county comprises the San Juan School District. Although large in size, it is not large in population nor in school enrollment. During the 1969-70 school year, for example, the average daily attendance for the District was 2,039 (Moffitt, 1971).

Tables 2 and 3 indicate the actual enrollment of students in the elementary and high schools, respectively.

Enrollment projections. Previous studies project a gradual growth of student enrollment during the next few years. The study by the Utah State Board of Education (1969) used two methods of enrollment projection: the survival technique, and the judgment of school officials and statistics personnel at the State Office.

The survival technique proved to be quite unreliable in this circumstance; therefore, only those projections based on the judgment of school officials and statistics personnel are shown (Tables 4 and 5).

Several factors contribute to the difficulty of accurately projecting enrollments:

1. The variety of attendance options open to Indian students: foster homes outside the county, Bureau of Indian Affairs (BIA) schools, public schools, and some do not attend school. The change of programs

Table 2. Actual enrollments of elementary schools from fall reports, 1964-65 through 1971-72

Year	Monticello	Blanding & Albert Lyman	La Sal	Montezuma Creek	Mexican Hat	Bluff
1964-65	423	586	72	104	98	49
1965-66	400	582	64	118	21	29
1966-67	388	578	28	144	19	53
1967-68	385	570	33	225	31	26
1968-69	371	579	36	212	77	39
1969-70	375	629	32	243	83	52
1970-71	372	641	29	264	106	58
1971-72	374	639	34	280	115	118

Source: Utah State Board of Education, 1969, p. 24 and San Juan School District, 1970, 1971.

Table 3. Actual enrollments of high schools from fall reports, 1964-65 through 1971-72

Year	Monticello High 7-12	San Juan High 7-12
1964-65	335	393
1965-66	318	416
1966-67	311	441
1967-68	311	465
1968-69	312	499
1969-70	309	509
1970-71	313	573
1971-72	320	656

Source: Utah State Board of Education, 1969, p. 25 and San Juan School District, 1970, 1971.

Table 4. Predicted enrollments of elementary schools based on judgment of school district officials and statistics personnel, Office of State Superintendent of Public Instruction

Year	Monticello K-6	Blanding & Albert Lyman K-6	LaSal 1-6	Montezuma Creek K-6	Mexican Hat 1-6	Bluff K-6
1969-70	372	597	40	235	130	66
1970-71	375	598	36	262	162	77
1971-72	369	596	36	281	195	119
1972-73	376	600	41	304	225	142
1973-74	373	593	38	326	248	157

Source: Utah State Board of Education, 1969, p. 26.

Table 5. Predicted enrollments of high schools based on judgment of school district officials and statistics personnel, Office of the State Superintendent of Public Instruction

Year	Monticello High 7-12	San Juan High 7-12
1969-70	306	555
1970-71	306	616
1971-72	295	667
1972-73	308	716
1973-74	308	783

Source: Utah State Board of Education, 1969, p. 27.

at Intermountain Indian School in Brigham City will have an undetermined effect on school attendance in San Juan County.

2. The high birth rate among Indians coupled with a declining Anglo student population (1961-68 decreased by 184 students, 1968-71 decreased by 407 students).

3. The possibility of future discoveries of oil and/or uranium (although such is not anticipated, exploration is continuing).

4. A new bridge across the San Juan River near Bluff, completed in the summer of 1971, increased the enrollment at Bluff Elementary School from 58 in 1970-71 to 118 in 1971-72. Approximately 10 more high school students ride the bus as a result of the bridge; however, Mr. Bruce Shumway (1971) (Director of Family Services, Blanding) reported that the full impact of the bridge will not be felt until buses cross the bridge to pick up students. Due to road conditions, parents must bring their students to Bluff. Mr. Shumway estimated that an additional 150 students would attend with this provision.

5. An increased trend toward public school attendance as reported by Mr. Shumway. In 1970-71 there were approximately 300 students attending schools outside the county (BIA and foster placement) and 350 students at the BIA school in Aneth.

6. An addition to the Mexican Hat Elementary School which will accommodate an additional 63 elementary students who have attended in Kayenta, Arizona. An additional 48 junior and senior high school students also attend in Kayenta, but this program will be phased out.

7. Anticipated projects involving the pumping of water to the level plateaus along the San Juan River. One project in the advanced planning stages will accommodate 130-150 families on a 5,000-acre tract

of orchards. The success of this venture will determine the development of other tracts (Black. 1972).

In the north-county area uncertainties also make enrollment projections difficult. At the present time, Rio-Algom Corporation and Keystone Wallace Resources are in the process of building copper and uranium processing plants in the La Sal area. Each of these plants will employ 120-130 persons. There are very few living accommodations at La Sal and the highway network encourages the employees to live in Moab. However, some families may live in the Monticello area. Trailer courts and other housing will undoubtedly be constructed in La Sal, which would then increase the enrollment in La Sal elementary school and in Monticello High School. Further, Richard Smith, operator of Canyonlands Resort 40 miles northwest of Monticello, also envisions the expansion of year-round tourist traffic to the point that 100 persons would be permanently employed at that location.

In summary, any attempt at enrollment projections are very tentative and little more than an educated guess. Substantial growth is anticipated, but the extent and rapidity of expansion is very conditional.

Racial differences. The education of Navajo children has been a series of challenges and opportunities to those responsible for the development and success of all students enrolled in schools. Major deterrents to educational growth are language and cultural differences; however, other factors also contribute to differences in interests and achievement.

> Indian parents who themselves never attended school, or at most only to a limited degree fail to see the need of an education for their children. Consequently, school attendance is a challenging problem. The younger children

> too frequently do not commence school at the same age as the Anglo children. From the first years, therefore, many Indian children become retarded. This retardation tends to increase as their years in school pass.
>
> The expectation of an Indian parent for his child's success in school commonly differs substantially from that of the white middle-class parent. (Moffitt, 1971, p. 6-7)

The percent of students in each of the two major races has changed substantially during recent years and these changes are expected to continue for an indefinite term.

Most of the changes in percentage of enrollments by race has been in the San Juan High School attendance area. Table 6 shows the enrollment changes by racial groups at San Juan High School.

An examination of enrollments in the elementary schools which feed San Juan High School indicates that the trend is likely to continue. Table 7 shows the number of students enrolled in the elementary schools by race during the period from 1967 to 1971.

The increase in Indian enrollments is a reflection of two factors: the birth rate among the Indians is approximately three times that of the Anglo people, and forces are now at work which are bringing a higher percentage of the Indian children into the schools. The largest increase of Indian students is still in the elementary schools. With these increased enrollments and with learning of greater depth in the elementary schools (particularly the mastering of the English language), the Indian students will be better prepared and have more encouragement to enter and graduate from high school. This trend has already started. In 1967 there were eight Indian students who graduated from San Juan High School. This increased to 10 students in 1970 and 22 in 1971.

Another factor which must influence the educational program is the fact that the Navajo Indians are attached to the Reservation and

Table 6. Enrollment by racial groups in San Juan High School, 1959 through 1971

Year	No. of Caucasian students	No. of Indian students	No. of Spanish-American students	Total enrollment
1959	377	12	4	393
1960	338	20	4	362
1961	297	23	3	323
1962	306	38	3	347
1963	311	65	5	381
1964	328	54	3	385
1965	345	56	5	406
1966	362	80	6	448
1967	370	111	5	486
1968	376	151	8	535
1969	362	179	8	549
1970	363	195	12	570
1971	344	305	7	656

Source: Moffitt, 1971, p. 8; San Juan High School, 1970, 1971.

Table 7. Enrollment in elementary schools by race, 1967 through 1971

Year	No. of Caucasian students	No. of Indian students	No. of other enrollees	Total	Percent Indian
1967	565	264	23	852	30.90
1968	503	396	14	913	43.37
1969	498	458	21	977	46.87
1970	454	602	16	1,072	56.16
1971	404	729	19	1,152	63.28

Source: San Juan High School, 1970, 1971.

that few leave for work elsewhere. They would rather wait in hopes of obtaining jobs near their homes, or at least on the Reservation, in preference to seeking work on the outside (Westinghouse Electric Corporation, 1969).

Special Considerations for Indian Education

Historical aspects

The early period of Indian education in the United States was an era of private, mostly church, education. The second period was dominated by government efforts. Although the current enrollment in mission and BIA schools is larger than ever before, the number in the public schools has increased so rapidly that two-thirds of all Indian students are enrolled in such schools; this can be properly called the era of public school education for Indians (Bass, 1969).

Although the history of attempts to educate the Indians dates back to colonial times, it was after the Civil War before a sizeable number was in school--and only in very recent years has there been anything approaching universal education for the Indians, particularly in the southwest. For example, among the Navajo Tribe (the largest in the United States) there were only 6,000 out of 24,000 school-age children in school in 1948, and only 200 of those were in high school. Approximately two-thirds of the people had received no schooling whatever and the median number of years of schooling for members of the tribe was less than one (Bass, 1969).

World War II had a definite impact on the realization of the necessity for schooling, as veterans returned home and others came back

to the reservation from war-time jobs. It was several years, however, before the government could meet the demands.

By 1968 more than 90 percent of the school-age Navajo children were attending school. There were also 785 Navajo students attending college on tribal and federal grants, and undoubtedly many others were attending under other financial arrangements.

A study of high school graduates

A study was conducted by Willard Bass in 1969 in an attempt to determine what was happening to the Indian students in the Southwest who graduated from high school. He conducted a follow-up study of 40 percent of the 1962 graduates in Arizona, Nevada, New Mexico, Oklahoma, Southern Colorado, and Southern Utah. The original sample included 360 females and 331 males, a total of 691 graduates. Due to various circumstances (deceased, overseas, etc.), 384 of the students were actually interviewed.

Very briefly, the survey developed the following information:

The "typical" high school graduate is a full-blood Indian, lives on the reservation, is married, graduated from public school, attended where Indians were a majority, speaks the tribal language well, has had formal post-high training, is a skilled worker, is employed by the government, and considers himself successful.

There was a negative relationship between the ability to speak the tribal language and frequency of continuing education beyond high school.

The higher the level of parental education, the more likely the student would be to continue his education.

The average number of children per family was between six and seven, nearly three times as many as the typical American family.

About one-third of the graduates transferred to another high school at least once during high school. There was a negative relationship between the number of transfers and the continuation of education.

Approximately 75 percent of the graduates continued their education beyond high school, and more than two-thirds of those who did so completed the post-high program. The great majority of entries and completions were in vocational-technical programs, with 44 percent of the graduates completing such training and 7 percent completing college.

The majority of women were in clerical and service occupations and men were working mainly as craftsmen, operatives, service workers, and laborers. Several had entered professional fields, with teaching being the most popular choice.

The needed change most often mentioned by those who did not continue beyond high school was more vocational education. This was the second-ranked change (after more academic emphasis) mentioned by those who continued.

The high attrition rate among college students is disturbing, with the language handicap being a universal problem. This also hinders those in vocational-technical programs and in getting and holding jobs.

Students need more information about educational opportunities, and especially about occupational careers. This needs to be done over a period of years, and counselors should make as much use of teachers as possible in this regard.

More vocational education of an exploratory nature should be available to the Indian student. Work experience programs would be desirable.

Efforts should be made by all concerned to initiate programs of economic and industrial development on or near the reservation. This will help to keep the potential leadership of the young people near the reservation where it will be most beneficial.

A study of dropout Indian students

Another study conducted by Owens and Bass (1969) was concerned with the Indian students who did not finish high school. The study encompassed the same geographical area as the study of graduates and involved students who entered the eighth grade in 1962. They found that the dropout rate was 38.66 percent for males and 38.73 percent for females in grades 8 through 12. They further found that mobility (the necessity of transferring from school to school) was a definite factor in increasing the dropout rate and suggested that the problem of multiple transfers should be seriously considered when planning educational programs.

The fact that the highest percentage of Indian students drop out on the eighth-grade level (11.7 percent) is a matter of deep concern. Obviously, most of the dropouts do not have the opportunity to develop any marketable skills or to enjoy any measure of self realization. Educational planning must increase the relevancy of the educative process and the students must be encouraged and shown the necessity of education through every means possible.

Owens and Bass (1969) found that Southern Utah had the largest percentage of dropouts by a wide margin (71 percent compared to 48.7

percent in Southern Colorado, which was next highest). This may have been influenced by sample size, however, as there were only 14 students from Southern Utah in the sample. Another disturbing statistic is that 67.8 percent of the dropouts in Southern Utah occurred in the eighth and ninth grades.

Vocational education needs for Indians

The problem of vocational preparedness and employment opportunities is demonstrated by the fact that Indians comprise less than one-tenth of the labor force in the Four Corners Region, yet one-fourth or more of the Region's unemployed workers are Indian (Reno, 1969). The lack of equal opportunity is reflected in an incidence of poverty which is two to three times that of non-Indian areas. Vocational training--in itself--will not be enough, but it is increasingly recognized as one of the major, essential elements in overcoming unemployment and the resulting deprivation.

In the national economy, a high school diploma or equivalent is nearly a necessity to acquire a job which pays a living wage. Yet, among the Navajos, of those over 14 years of age only 9 percent had completed 12 years of schooling.

Only 2,000 of the 20,000 non-employed reported that they had held any type of professional, managerial, skilled, semi-skilled, or clerical jobs. The other 18,000 had held unskilled, farm jobs, or had never worked.

A CAMPS (Cooperative Area Manpower Planning Services) report suggests that the oversupply of unskilled laborers should be redirected and trained for other work and that trained workers are in short supply in most all fields. The report suggests that there

is a definite need for clerical, sales, food service workers, and mechanical craftsmen (Navajo Area CAMPS Committee, 1971).

Table 8 gives an indication of the percent of Navajos employed by occupational category. In planning vocational programs, it is important to note the higher percentages of employment in professional and managerial, service, and skilled categories.

Table 8. Number and percent of the employed Navajo population by occupational category, 1966

Occupational category	Total employed	Percent of total employed
Professional and managerial	1,900	22
Clerical	650	9
Sales	150	2
Service	1,900	22
Farming	100	1
Skilled	1,450	17
Semiskilled	700	10
Unskilled	1,500	17
Totals	8,250	100

Source: Reno, 1969, p. 10.

In areas of lagging economy such as the Four Corners Region, the development of a trained labor force is an absolute essential for economic and industrial advance. It is not enough to train workers for jobs already in existence, for a skilled labor force will create

its own opportunities as well as attract outside investment. It should also be noted that training skilled workers in specific occupations will open jobs for others in addition to the skilled workers in the specific occupations.

The study by Reno (1969) suggests the following general conclusions regarding vocational education programs among the Indians:

Indians need vocational education to find jobs in their own area or in other areas.

Training among Indians is most effective when work experience and institutional training are alternated.

Long-range provisions for training and retraining are needed.

Training programs should recognize their lack of work experience and also the unique features of their culture.

Education programs need to be integrated with programs which will provide employment.

Indians should be involved in the planning and policy-making decisions relating to programs of vocational education.

The report by the Navajo Area CAMPS Committee (1971) states that the most pressing needs were training programs, employment, and economic development. Training in the following specific areas is suggested:

1. *Human service occupations in government.* These jobs encompass the major employment opportunities, but because of training requirements most are held by non-Navajos who do not have the language, cultural understanding, and empathy needed to successfully serve the Navajo people.

2. *Business management.* Over three-fourths of the licensed businessmen on the reservation are non-Navajo. Although many Navajos have the

skills to be employed, they do not have sufficient business management and supervisory skills to own and operate a business.

3. *Skilled crafts and trades.* Construction offers exceptionally favorable job potential. Over $40 million in construction is performed annually on the Reservation, but most of the skilled workers are brought in from outside the Reservation.

4. *Agriculture, livestock management, and handicrafts.* Capital input will be required and business management skills must be developed, but agriculture and handicrafts are part of a way of life with values deeper than economics.

5. *Industrial development and economic planning.* This is necessary to provide employment opportunities for those persons who are participating in the various training projects.

The report further stresses that the major barriers are lack of vocational skills and education resulting in a surplus of unskilled and semiskilled workers. Problems in priority order are: (1) job skill training, (2) transportation, (3) summer youth employment, (4) housing, (5) health services, (6) education, and (7) day-care facilities.

The Occupational Outlook and Projected Trends in Employment

Realistic planning of programs for occupational education must include a survey of projected job opportunities so that persons receiving training can be guided toward a market where openings are available. A variety of resources are available indicating projected employment in the various occupations. The predictions, although somewhat contradictory at times, give a general indication of the greatest potential for future employment.

The outlook in San Juan County

The petroleum and uranium boom of the 1950's resulted in a large increase in employment. Table 9 shows the rate of employment in the county from 1940 to 1960.

Table 9. Employment in San Juan County, 1940-60

Industry	1940	1950	1960
Agriculture	986	768	263
Mining	28	200	695
Contract construction	39	71	347
Manufacturing	178	174	66
Transportation	15	125	105
Wholesale and retail trade	48	113	330
Finance, insurance, and real estate	1	2	22
Services	77	216	426
Government	25	34	132
Other	5	30	82
Total	1,432	1,733	2,468

Source: Planning and Research Associates, 1968b, p. 37.

The data indicate a substantial decline in agricultural occupations with a compensating rise in other jobs.

Other information from the Department of Employment Security (1971) (Table 10) updates the employment picture, although Tables 9 and 10 cannot be directly compared because of a difference in job definitions between the two sources (the Bureau of Census considers employment in

terms of the number of individuals who hold jobs, while the Department of Employment Security considers employment only in terms of the number of jobs).

Table 10. Employment on non-agricultural payrolls in San Juan County, 1964-69

	1964 2nd qtr.	1965	4th qtr. ave. 1966	1969
Mining	458	330	363	380
Contract construction	214	97	60	51
Trans., comm., and utilities	163	153	131	96
Wholesale and retail trade	245	243	271	286
Services and misc.	120	130	128	214
Government	428	473	524	504
Other	111	103	160	448
Total	1,739	1,529	1,637	

Source: Planning and Research Associates, 1968b, p. 37; Department of Employment Security, 1971, p. 1.

Other information from the Department of Employment Security indicates a steady decline of agricultural occupations from 800 in 1950 to 580 in 1960, to 410 in 1964, and to 297 in 1969. The trend underlying the decline is due to alternative employment and government agricultural policy.

Projections for future employment in the county are included in Table 11. The data indicate substantial employment growth in construction,

Table 11. Predicted employment for selected industries in San Juan County

Classification	3rd quarter								% growth
	1960	1965	1966	1967	1970	1975	1980	1985	1970-85
Agriculture	580	360	320	320	320	310	300	280	-12.5
Mining	1,434	330	313	353	475	525	500	500	5.2
Government	314	473	519	529	540	585	640	700	29.6
Manufacturing	66	99	W	155	170	185	210	230	32.3
Construction	115	97	73	58	75	95	110	130	73.3
Trans., comm., and utilities	120	153	134	114	125	135	145	160	28.0
Service and miscellaneous	94	130	137	148	180	260	345	390	116.7
Wholesale and retail trade	278	278	271	266	280	310	330	360	28.6

Source: Planning and Research Associates, 1968b, p. 93.

service occupations, government, manufacturing, and transportation and utilities, and a decrease in agricultural occupations.

One of the critical concerns of San Juan County is that most of its young people (particularly the Anglos) have to leave the county in search of employment. Although growth in employment is projected as indicated previously, the growth will not absorb those entering the work force, so the exodus is expected to continue. For this reason, and because of increasing population mobility, it is necessary to consider the employment projections in the state, the region, and the nation.

Employment projections in the state of Utah

Projected employment opportunities in Utah seem to indicate that most growth will occur in the areas of manufacturing, construction, wholesale and retail trade, service, and government. (See Appendix A-1.) Although some of the specific numbers disagree, the trend is indicated. Some of the specific types of jobs which show substantial growth are shown in Table 12. In most cases, the range of openings projected by the various sources is shown. (See Appendices A-2 and A-3.)

Employment outlook in the region

The region herein considered is the Four Corners Region described by other reports, and includes most of the counties in Utah, Colorado, New Mexico, and Arizona (Figure 3). This area surrounds San Juan County and will have a decided influence upon employment opportunities in the future.

One survey by the Sterling Institute (1971) indicated that the major growth in the region would center around trade, services, and government

Table 12. Annual new and replacement jobs for selected occupations in Utah, 1967-75

Occupational title	Range of openings
[a]Auto mechanic	200-300
Auto service station attendant	1,150
[a]Bookkeepers	270-300
[a]Carpenters	200-300
[a]Clerks (office)	550-700
[a]Cooks	500
[a]Dental assistant	100-240
[a]Draftsmen	240
[a]Electricians	50-100
Key punch operators	200
[a]Nurse aide	600
[a]Operating engineers	125-200
Plumbers	100
Painters	200
[a]Secretaries	500
[a]Stenographers	300
[a]Welders	100

Source: See Appendices A-2 and A-3.
[a]Indicates jobs which are traditionally hard to fill.

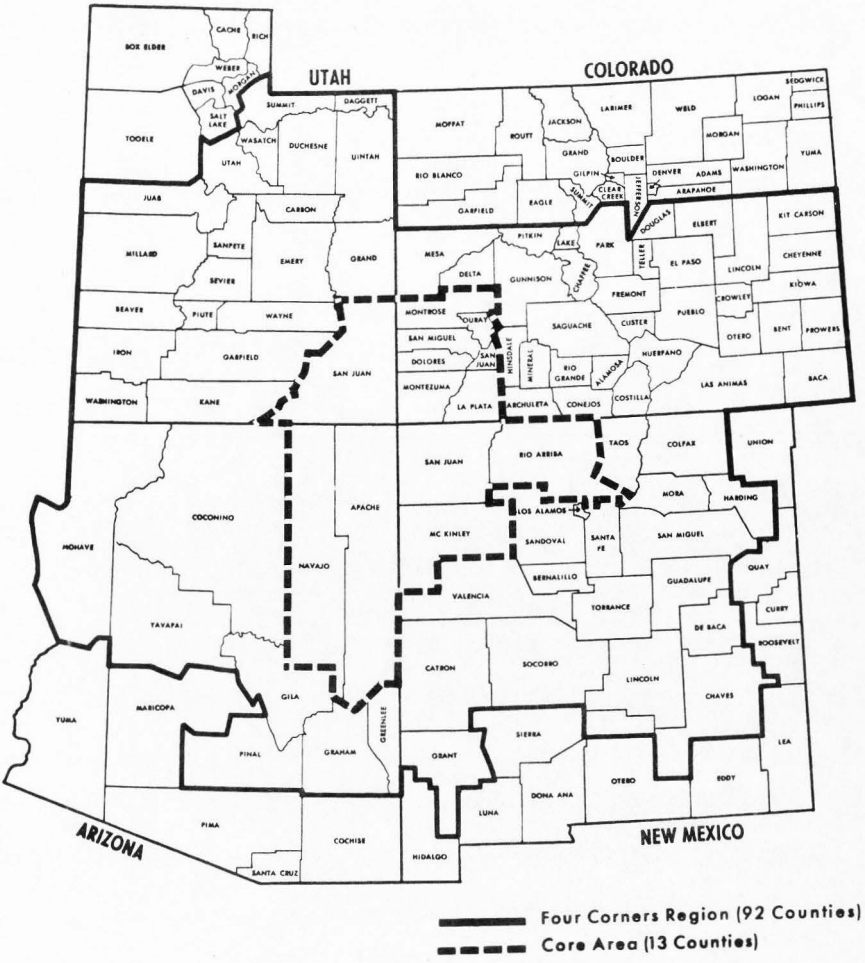


Figure 3. The immediate Four Corners area in perspective. (Westinghouse Electric Corporation, 1969, p. 4-2)

in each of the four states with the added bonus of manufacturing and finance, particularly in Arizona. The employment growth rates in Arizona and Utah of 4.9 percent and 3.6 percent, respectively, are expected to exceed the growth in Colorado at 1.9 percent and New Mexico with 2.0 percent. (See Appendix A-4.)

An interesting study by Westinghouse Electric Corporation (1969) used two methods for projecting employment trends in the region--a standard figure regarded as the level most likely to be reached and an optimum figure based on a combination of assumptions favorable to the region. The basic assumptions of the optimum or "innovative" growth rates were: maximum level of economic development, resolution of regional development problems, a concentrated effort by the four states to develop the region, and sustained high rate of economic growth in the nation.

Table 13 summarizes the projections of the Westinghouse study. The "Core Area" is the same as the Immediate Four Corners (IFCA) referred to in other studies. See Figure 3 and Appendices A-5 and A-6.)

It will be noted that Table 13 reflects only those occupations which are described as major contributors to the employment of the area. Manufacturing, tourism, and research are expected to show the most growth. The study also suggests that the research and manufacturing will be centered around light industry such as electronic components, hearing and optical instruments, fabricated metals subassemblies, small molded and extruded plastic and rubber items, and drugs and biochemicals.

It should also be noted that the Westinghouse study recommended the development of a new city of 250,000 population at the immediate geographic location of the Four Corners. The development of the new city

Table 13. Major elements of employment growth in the Four Corners Region and Core Area, 1967 and 1990[a]

	Four Corners Region			Core Area		
		1990			1990	
	1967	Standard	Innov.	1967	Standard	Innov.
Manufacturing	50.0	112.0	137.0	5.1	16.4	21.5
Mining	34.0	58.0	80.0	6.2	12.0	16.4
Agriculture	47.0	63.0	70.0	5.0	6.8	7.8
Research and development	17.0	48.0	70.0	.1	8.0	15.0
Tourism	38.0	88.0	108.0	4.2	10.0	13.0
All other	416.0	711.0	885.0	49.6	83.0	107.5
Total	602.0	1,080.0	1,350.0	70.2	136.2	181.2

Source: Westinghouse Electric Corporation, 1969, p. 5-7.
[a]In thousands.

would provide a level of development over and above either the "standard" or "innovative" projections.

A study by the Battelle Memorial Institute (Douglas et al., 1971) recommended the most feasible industries to be located in the Four Corners Region considering a number of limiting factors associated with the area.

In very brief summary, the study recommended the following types of industries as most feasible for the region as a whole (Appendix A-7): concrete products, metal office furniture, food products machinery, printing trades machinery, scales and balances, office machines, electric measuring instruments, mortician goods, metalworking machinery, paper industries machinery, cut stone and stone products, typewriters, ceramic wall and floor tile, and metal cutting machine tools.

Also interesting to note are the industries which are considered most feasible for the four subregions immediately surrounding San Juan County (Coconino, Arizona; La Plata, Colorado; San Juan, New Mexico; and Grand, Utah). The most highly recommended industries for this "Core Area" included: metal office furniture, concrete products, scales and balances, office machines, food products machinery, printing trades machinery, electric measuring instruments, and paper industries machinery.

The industries recommended as the "number one" possibilities for the Grand, Utah, subregion (which is comprised of Grand and San Juan Counties) are: concrete products, metal working machinery, office machines, blowers and fans, electric lamps, furniture and fixtures, veneer and plywood, and sawmills and planing mills.

Those industries receiving a "number two" ranking for the Grand subregion were: metal office furniture; food products machinery; scales and balances; electric measuring instruments; cut stone and stone products; paper industries machinery; fertilizers; public building furniture; hoists, cranes, and monorails; hardwood dimension and flooring; and farm machinery.

In general, the recommended industries included those associated with assembly of small and moderate size machinery, metal furniture, electrical apparatus, and those using the forest and stone resources.

Projected employment in the nation

Recognizing the increasing mobility of the population and the effect that national employment trends have upon regional and local job opportunities, it is important to consider projections at the national level.

Some of the trends forecast for 1980 on the national level which will influence employment (according to the U.S. Department of Labor) are:

> A substantial shift away from federal spending for defense, particularly in aircraft, electronics and munitions. Spending on highway construction will taper off by 1980, spending for public education will drop dramatically in the rate of increase. (McDonald, 1970, p. 12A)

This same article suggests a "fantastic demand" for employees in health services and residential construction. Great demand was also forecast for service and wholesale-retail trade.

Carey (1971) suggested that 85 percent of the skilled job openings available in the 1970's would be in five craft occupation areas: construction craftsmen (growing by 31 percent from 1968 to 1980), mechanics and repairmen (27 percent growth), foremen (15 percent growth), metal working craftsmen (10 percent growth), and printing craftsmen (7,500 jobs annually). The report also gives a description of occupations expected to provide more than 3,000 job openings annually and explains how most of the jobs are filled. (See Appendix A-8.)

Although these figures indicate the actual projected job openings, they do not indicate the size of each industry, the percentage of jobs in each industry available each year, or the number being trained by the various educational or experience opportunities.

Another report by the U.S. Department of Labor (1971) is summarized in Appendix A-9 and indicates the projected annual job openings, the number employed in each occupation, and the number of completions expected from the various educational institutions.

Conclusions regarding employment outlook

1. Occupations which will have significant growth in the county, state, region, and nation include: construction (carpenters, plumbers, and electricians), secretarial occupations, and service-repair occupations.

2. Occupations showing significant growth in the county, state, and region in addition to the above include: manufacturing (mostly related to metal fabrication, plastics, and electrical-electronic industries).

3. Occupations projected as having significant growth in the state and nation but not necessarily in the county and region include: health occupations and computer occupations. (This is somewhat of a dichotomy. Personal discussions with area residents and community leaders indicate an urgent need for health personnel. This occupational area is not isolated in projections, however.)

4. Occupations showing substantial growth in the county and region in addition to those mentioned above include: employment related to tourism, wholesale-retail trade, government, and mild growth in mining and agriculture.

5. Because of the lack of mobility of the Indian population, special consideration must be given to training for those occupations which are projected for the immediate area. These include construction occupations; secretarial occupations; service-repair occupations; metal, plastic, and electrical fabrication; health occupations; tourism trade; wholesale-retail trade; government; and (depending somewhat on future developments) mining and agriculture.

6. From the foregoing it is apparent that the vocational training program should consider the broad fields of: power mechanics (auto, diesel, farm power, on and off-road vehicles), building construction (all phases), electrical-electronic manufacturing and repair, manufacturing industries (metalworking and plastics processes), health occupations, office occupations (bookkeepers, clerks, secretaries, stenographers, data

processors), service occupations related to all of the above, food and personal service occupations (to serve the tourism trade), and distributive occupations.

7. There must be concerted effort in the county and region towards enticing manufacturing and tourism industries to locate in the area to provide employment and to bolster the economy.

8. One other consideration is appropriate. The state projection indicates a shortage of operating engineers. The national outlook forecasts a decline in highway construction during the 1970's which may cause an influx of operators into the state. One of the critical concerns influencing both the growth of tourism and manufacturing in the region is the need to improve and expand the network of roads and highways in the area. This will expand the opportunities for operators and may be a consideration in planning training programs which will provide employment opportunities and allow the Indians to remain on or near the reservation. Some type of program in heavy equipment operation and repair should be considered.

Local Surveys of Interests and Needs

To ascertain the opinions and interests of county residents concerning vocational education, questionnaires were distributed to current high school students, recent alumni (graduates and those not completing high school), district teachers and administrators, employers, and adults.

The questionnaires were formulated by analyzing information from the occupational projections to determine the most appropriate program offerings coupled with information suggested on questionnaires of similar projects in other areas.

Opinions and comments regarding the type of programs that should be offered were kept separated into the respective attendance areas of the two high schools. Because of the long distances that students must travel from the extreme north and south ends of the county, school district officials were desirous of expanding the facilities at Monticello High School to offer a few of the most needed and most popular programs. The area vocational center will be constructed adjacent to San Juan High School and students from Monticello *may* be bused to the center; however, the chances are quite remote that substantial numbers of the Monticello students will attend the center in Blanding. Since the Monticello area will have little influence on program offerings at San Juan High School, the survey results of the Monticello area are not included in this report although the data are available.

Current high school students

Questionnaires were distributed to students by the teachers during home room period. A meeting was held with the faculty previous to the distribution to discuss the importance of vocational education, a proposed overall program of vocational education, and specific questions regarding the questionnaire. The student questionnaire is included as Appendix B-1. It is realized that the students do not have adequate background information to make a well informed judgment of the type of program best suited to their abilities and interests; however, it is important to receive the input of students as they best understand their interests. Of the 656 students at San Juan High School, there were 583 usable returns. The students were asked to pick out their first, second, and third choice from a list of 15 possible vocational courses that might be offered.

Tabular results of the surveys are shown in Appendix B-2. Points were awarded to each possible program on the basis of three for a first choice, two for a second choice, and one for a third choice. The points were then totaled to give the points indicated on the included tables. Grades seven through nine were combined to arrive at an indication of the potential interests of junior high students, realizing that they specifically lack the background to make a realistic choice of programs.

The combined and total points for all students surveyed at San Juan High School are shown on Table 14. The boys showed most interest in auto mechanics, auto body repair, electronics, welding, agriculture, and building trades. The girls most often chose home economics, cosmetology, business education, health occupations, and commercial art.

It is also noted that a few students expressed an interest in "other" programs. These were basically three areas: teaching, aircraft mechanics, and heavy equipment operation.

The students were also asked to indicate whether or not they would enroll in the classes in which they had expressed an interest. An overwhelming majority of 91.9 percent (511 out of 556) said that they would enroll if the classes were offered.

In response to the question of what their main interest would be in taking the class, vocational or elective credit for own interest, 55.6 percent said their main interest would be to pursue an occupation related to the class. It is interesting to note that students in the higher grades expressed more interest in taking the classes for vocational reasons. The following shows the percentage of students desiring the class for vocational interest by grade level: seventh grade, 58.6 percent;

Table 14. Indication of vocational programs desired by students at San Juan High School[a]

Type of class	Males		Male total	Females		Female total	Overall total
	Anglo	Indian		Anglo	Indian		
Agriculture	92	51	143	9	6	15	158
Auto mechanics	222	215	437	18	8	26	463
Auto body repair	80	114	194	6	9	15	209
Building trades	92	20	112	10	6	16	128
Business education	25	14	39	160	218	378	417
Commercial art	38	25	63	84	45	129	192
Cosmetology	1	2	3	219	162	381	384
Drafting & design	63	33	96	15	12	27	123
Electronics	95	57	152	3	6	9	161
Graphic arts	10	10	20	26	29	55	75
Health occupations	20	3	23	146	119	265	288
Home economics	1		1	245	160	405	406
Market & distrib.	21	7	28	15	16	31	59
Machine shop	26	48	74	1	3	4	78
Welding	82	65	147	0	6	6	153
Other	16	1	17	21	3	24	41

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

eighth grade, 40.5 percent; ninth grade, 54.1 percent; tenth grade, 68.6 percent; eleventh grade, 63.7 percent; and twelfth grade, 65.5 percent.

It is also interesting to note the percentage of Indian and Anglo students who expressed the vocational aspect as their main reason for possible enrollment in the classes. The boys chose "vocational" more often than did the girls, with the Indian boys being highest. However, the extremely high percentage of seventh grade Indian boys choosing this reason is quite out of line when compared with the other figures. Table 15 shows the percentages by grade, by race, and by sex.

Table 15. Percentage of students indicating "vocational" as their main reason for enrolling by grade, race, and sex

Grade	Indian		Anglo	
	Male %	Female %	Male %	Female %
7	86.2	57.6	42.4	48.1
8	50.0	32.4	46.2	33.3
9	55.6	29.6	62.5	68.8
10	58.3	78.9	68.4	68.8
11	71.4	55.6	68.0	57.8
12	60.0	60.0	70.6	69.6
Average	63.6	52.3	59.7	57.7

A large proportion (87.3 percent) of the students also stated that the "other reason" (vocational or elective credit) would also be a factor in enrolling in the class.

When the students were asked what they intended to do after leaving high school, their responses indicate some interesting diversities between the Anglo and Indian students. For example, over half of the Anglo students said they were going to attend a four-year university, while only one-fourth of the Indian students chose that response. Nearly one-third of the Indian students said they would attend a junior college compared to 13 percent of the Anglo students. The percentage of Indian students indicating they would go to work is nearly twice that of the Anglo students--20.6 and 11.4, respectively. Table 16 shows the intentions of the students after leaving high school.

As a result of the foregoing data, the following conclusions are apparent concerning vocational programs at San Juan High School when only the desires of the students are considered:

1. The following programs should be considered: auto mechanics, business education, home economics, cosmetology, health occupations, auto body repair, commercial art, electronics, agriculture, and welding.

2. Students are interested in enrolling in programs of vocational education. This interest generally increases with grade level.

Survey of district staff

All of the instructional and administrative staff in the school district were asked to respond to a questionnaire (Appendix B-3) which would give a reflection of the type of programs they thought should be offered. Personnel from other agencies such as Head Start and Adult Basic Education were also given the questionnaires. The instructions were to put a one (1) by every program which should definitely be offered and a two (2) by other programs which should be included if possible. Points

Table 16. Intentions of students after leaving San Juan High School by grade and race

	7th grade		8th grade		9th grade		10th grade		11th grade		12th grade		Total		Percent	
	Ind.	Ang.	Ind.	Ang.	Ind.	Ang.	Ind.	Ang.	Ind.	Ang.	Ind.	Ang.	Ind.	Ang.	Ind.	Ang.
Go to work	18	10	17	4	10	6	3	4	5	7	1	4	54	35	20.6	11.4
Junior college	17	8	16	7	17	6	17	6	10	10	8	4	85	41	32.4	13.4
Voc. school	2	3	3	4	7	6	5	5	3	10	6	8	26	36	9.9	11.8
University	18	31	15	31	15	31	10	19	3	26	6	21	67	159	25.6	52.0
Military	8	3	12	4	4	4		5	1	1			25	17	9.5	5.6
Housewife	1	4		5	1					3		1	2	13	.7	4.2
Other		1			1	1		1	2			2	3	5	1.1	1.6
Totals	64	60	63	55	55	54	35	40	24	51	21	40	262	306		

for the various programs were awarded on a basis similar to that for the student questionnaires: two points for a first choice and one point for a second choice. On this basis the programs received the following number of points, in rank order: auto mechanics, 160; building trades, 153; business education, 145; health occupations, 144; home economics, 137; agriculture, 130; electronics, 124; welding, 117; auto body repair, 114; machine shop, 105; cosmetology, 94; commercial art, 90; drafting, 85; graphic arts, 82; and marketing and distribution, 81.

The staff was also asked to suggest other programs which might be of value to the students and/or businesses of the area. The following were suggested: heavy equipment operation and maintenance, arts and crafts design and development, furniture design and development, orientation to occupational opportunities, dry cleaning services (home economics), upholstering, vocational ceramics, modeling, computer technology, and interior decorating.

Additional comments which were offered concerning vocational programs are shown in Appendix B-4.

Survey of employers

In an effort to ascertain the programs which would be of most worth to county businesses and employers and to receive their opinions on other implications of program planning, a questionnaire was sent to every business listed in the yellow pages of the telephone book. The original return was approximately 40-45 percent. A follow-up letter and questionnaire was sent out which increased the return to approximately 60-65 percent. The lists of those not yet returned were then studied to determine those who should be personally contacted. The personal contacts

increased the return to 77 percent in the Blanding area and 88 percent in the Monticello area. The employer questionnaire is shown in Appendix B-5.

Of the 77 employers listed in the Blanding area, 59 returned questionnaires. The questionnaires were divided into groups by occupational categories to show the type of business, the number of employees, and whether or not the business is expected to grow (Table 17).

Table 17. Indication of occupational category, number of employees, and growth expectations in the Blanding area

Occupational category	No. of employers responding	No. employed by those responding	Growth expectations[a]		
			Increase	Static	Decrease
Personal service	10	54	6	4	
Other services	16	78	6	8	1
Manufacturing					
Government	7	62	2	4	
Mining	3	15	1	2	
Wholesale-retail trade	20	92	5	12	
Construction	3	6	1	2	

[a]Not all employers responded to this question.

This indicated that the employers are quite optimistic about the growth potential of the area. Of those responding to this question, 39 percent anticipated growth, 59 percent expected their business to continue

the same number in employment, and only 2 percent indicated a decline in employees (this was a repair shop owner who said he was going to sell his business and retire).

The employers were asked to identify three basic manipulative skills important to a new employee in their business. Their comments centered around skills which would be included in programs of business education, power mechanics, construction, service-repair, and home economics. (Employer comments are shown in Appendix B-6.)

The employers were also asked to identify three personality traits which would be important in their business. It is apparent that the "old-time virtues" are still considered important by employers, as the most frequently mentioned personality traits were honesty, good attitude, good personality, dependability, and promptness.

In responding to the question of whether manipulative skills or personality traits were more important, 56 percent of the employers felt that the two were about equal, 30 percent said the personality traits were most important, and 13 percent suggested that manipulative skills were most important.

When asked how the school could help upgrade present employees, the employers indicated the following: personal relationships courses (5), business education courses (5), mechanics courses (3), construction courses (2), clerical and mathematical skills, courses of the National Association of Retail Grocers, training in efficiency and thoroughness, and provide a "labor pool."

Seventy-nine percent of the employers said that they would hire a recent high school graduate who had the basic manipulative skills and personality traits to serve their business. Fourteen percent were

undecided on the issue and 7 percent indicated that they probably would not hire such an individual. Some of the reasons given by those indicating "no" included: "employees must be 21 years old"; "it takes five or six months to learn the procedures, and young single girls generally do not stay long enough to be of value"; and "it takes more training than that" (TV repair). Others said that they would employ recent high school graduates, but would prefer more maturity and experience.

Similarly, when asked if they would hire a high school dropout who had the basic skills and personality traits, a majority of the employers responded "yes" although they were more cautious. Sixty percent indicated they would, 20 percent said "probably not," and 20 percent were undecided. Some of the comments included: "it would depend on why they dropped out," "that's a pretty big *if*," "they usually are not dependable enough to hold a steady job."

When asked the types of vocational programs which would be most beneficial to the students and businesses of the area, the following were indicated: business education, 42; building trades, 39; auto mechanics, 38; electronics, 34; welding, 29; machine shop, 26; auto body repair, 24; health occupations, 22; agriculture, 20; marketing and distribution, 17; home economics, 10; cosmetoloty, 9; drafting, 7; commercial art, 6; and graphic arts, 6.

Other suggestions included: heavy equipment operation and maintenance, all-'round handyman, math related to occupations, and occupations related to mining.

The programs suggested by employers as most beneficial to their own businesses included: business education, 28; auto mechanics, 13;

marketing and distribution, 12; electronics, 10; welding, 6; commercial art, 5; machine shop, 4; health occupations, 3; home economics, 3; agriculture, 2; auto body, 1; cosmetology, 1; drafting, 1; and building trades, 3.

Indications of interest in programs of cooperative education were most encouraging. Twenty-one employers said that they would be interested, 9 indicated they would not, and 22 were undecided. Assuming that half of those who were undecided could be persuaded to participate, a potential of 30-35 training stations would be available--some with more than one trainee. The types of training stations indicated are shown in Appendix B-6.

Problems relative to cooperative programs were a concern to some employers. They included liability and insurance, and that customers do not feel they are receiving quality work from learners.

The employers were also asked for other suggestions on vocational education in the area. The comments are included in Appendix B-6 but generally center around encouragement for vocational education and tourist-oriented occupations.

Survey of adults

A questionnaire was sent to adults to obtain their opinions on the types of programs which should be offered. It was sent home with elementary students to the homes of Anglo parents and attempts were made to contact the Indian adults through agencies already working with the Indians (Adult Basic Education and Headstart). In both cases the return was quite disappointing; however, there was an indication of the types of classes desired, and since the Anglo interest centered basically around

those programs already determined as most popular among students, staff, and employers it was decided not to make further contact among the Anglo adults. Very few of the Indian questionnaires were returned, so a different approach was used as described later.

In the Blanding area, 87 questionnaires were returned: 34 male Anglo, 43 female Anglo, 8 female Indian, and 2 male Indian. Awarding two points for a first choice and one point for a second choice, the programs listed according to popularity were: business education, 36; health occupations, 35; home economics, 34; cosmetology, 28; building trades, 26; auto mechanics, 18; welding, 15; agriculture, 14; commercial art, 13; marketing and distribution, 12; auto body, 9; electronics, 8; drafting, 5; graphic art, 3; and machine shop, 2.

Several "other" classes were suggested, but they are all included in the broader areas encompassed by the above programs (e.g., diesel mechanics, salesmanship, advertising, L.P.N. courses, sewing, and clothes making).

Other comments on vocational education are included in Appendix B-8.

As mentioned previously, the return from Indian adults was very disappointing, so another approach was tried. All of the employees (many of whom are Indian) who work for the various agencies connected with the Indians in the Blanding area were asked to fill out a questionnaire (Appendix B-9) giving their opinion as to the programs which would be most beneficial to Indian adults. Sixty-one questionnaires were returned with the following results: business education, 46; auto mechanics, 46; health occupations, 45; building trades, 44; welding, 44; agriculture, 40; home economics, 40; auto body repair; machine shop, 28;

electronics, 26; drafting, 26; commercial art, 24; marketing, 24; graphic arts, 20; and cosmetology, 18.

Other vocational programs suggested included refrigeration, data processing, house painter, heavy equipment operator, child care, furniture making, upholstery, and house wiring. The suggestion was also made that budgeting, first aid, and personal hygiene classes would be beneficial to the Indian people.

The questionnaire also asked for opinions on programs for mobile units and arts and crafts classes. According to the suggestions, the following programs should be considered for inclusion in mobile units: home economics, business education, agriculture, welding, commercial art, sheep shearing, health occupations, building trades, drafting, electronics, and auto mechanics.

The Indian arts and crafts which were suggested were silversmithing and lapidary, rugweaving, leatherwork, pottery and ceramics, and basket-weaving. The opinions stated that these programs should be included in the new building as well as in mobile units. Although crafts is not traditionally a vocational program, because of the Indian culture and the demand for authentic curios and decorative pieces the Indian crafts can very well provide avenues of employment for many people. Discussions on the subject with curio dealers and others in the Blanding area indicate that the potential for crafts as a vocation is nearly unlimited. Of particular interest would be items which are less costly than those normally available.

As previously indicated, the programs desired by adults are basically the same as those suggested by other groups so, in effect, they merely strengthen the decisions on the programs which should be offered.

Survey of alumni

It was felt that alumni of the two high schools could offer worthy suggestions on vocational programs because of their recent exposure to high school and their following experiences in the job market or further educational endeavors. One-half of the graduates of the past five years were sent questionnaires. The original return was approximately 25 percent. A follow-up letter was sent which increased the return to approximately 35 percent. During Christmas season many of the alumni returned home and they were personally contacted by a secretary. This increased the return to 61 percent (80 returns) in the Monticello area and 48 percent (83 returns) in the Blanding area. The questionnaire is included as Appendix B-10. Data received from the questionnaires are included as Appendix B-11.) Forty-five female alumni, seven of whom were Indians, returned the questionnaires. Their first, second, and third choices of programs resulted in the following rank order of popularity when three points were given for a first choice, two for a second choice, and one for a third choice: health occupations, 59; cosmetology, 52; business education, 38; home economics, 35; commercial art, 24; marketing and distribution, 16; graphic art, 9; building trades, 7; auto mechanics, 6; electronics, 2; drafting, 2; and agriculture, 1.

Twenty-two of the young women were attending post-high-school institutions and nine were employed as secretaries, cashier-clerks, and waitresses. Twelve of those in school were attending four-year schools in Utah, five were in business colleges or junior colleges in Utah, and five were attending junior colleges out of state.

Seventeen of the girls had been employed in the Blanding area and 11 had been employed out of state with lesser numbers in other areas.

Seventy-four percent of those who had worked in the immediate area had worked for six months or less. The most popular employment was as secretaries, waitresses, cashier-clerks, and teacher aides. Secretarial and waitress were the most prevalent jobs for those who worked outside the area.

Seventy-eight percent of the girls said they would enroll in adult vocational education programs and indicated most interest in health occupations, home economics, business education, and cosmetology.

The following conclusions are apparent:

Nearly half of the young women were engaged in post-high education at the time of the survey, with nearly one-fourth of them attending four-year institutions.

Most of the employment opportunities were in secretarial, cashier-clerk, and waitress occupations.

The young women are relatively unstable in employment, with nearly three-fourths remaining on one job less than six months. It will be noted that this fact was a concern mentioned by employers (see page 72).

A substantial number of the young women found work in the immediate area, although apparently many were employed in short-term jobs.

Thirty-eight questionnaires were returned by male alumni, six of whom were Indians. They recommended the following vocational programs as most beneficial: auto mechanics, 44; building trades, 35; electronics, 30, marketing and distribution, 15; drafting, 14; welding, 12; agriculture, 10; auto body, 8; health occupations, 8; machine shop, 5; commercial art, 4; cosmetology, 2; and graphic art, 2.

Ten of the young men were employed, with construction occupations and mechanics providing most of the jobs. Sixteen were enrolled in school

with 11 attending four-year schools in Utah, three in junior or technical colleges in Utah, and two in junior colleges out of state.

Sixteen of the young men had worked in the Blanding area previously, with nine of them working for three months or less. Building trades was the most frequently mentioned job, but others were employed in service stations, mining, and ranching. Among those who had worked outside the immediate area, building construction was again the most frequent job with mechanics and oil well work following closely.

Fifty-three percent of the men said they would be interested in post-high vocational classes with building trades, auto mechanics, electronics, and metalworking being the most popular choices.

The following conclusions are apparent:

Approximately 42 percent of the young men were enrolled in post-high institutions at the time of the survey with approximately 30 percent attending a four-year school.

Most of the jobs which the young men obtained were related to building construction and maintenance, service station/mechanical, heavy equipment, or natural resources.

In summary, the alumni recommended the following programs as being most beneficial: health occupations, 67; cosmetology, 54; auto mechanics, 50; building trades, 42; business education, 38; home economics, 35; electronics, 37; marketing and distribution, 31; commercial art, 28; drafting, 16; welding, 12; graphic arts, 11; auto body repair, 8; and machine shop, 5.

Survey of college students

Since the return of Indian alumni was less than desired and follow-up is very difficult, Lynn Lee, Coordinator of Indian Education for San Juan School District, suggested that Navajo students currently attending colleges in Utah might be a good source of further input. Consequently, arrangements were made to have questionnaires filled out at College of Eastern Utah; Brigham Young University; Utah Technical College, Provo; Weber State College; and Utah State University. These schools were chosen because they have larger numbers of Navajo students in attendance. (See Appendix B-12 for questionnaire.)

Sixty-three questionnaires were returned. The students were asked to indicate a first, second, and third choice as to which vocational classes would be most beneficial to Indian high school students and adults. They suggested the following: agriculture, 54; business education, 45; health occupations, 27; auto mechanics, 25; building trades, 20; electronics, 16; welding, 10; auto body repair, 10; drafting, 9; cosmetology, 9; commercial art, 8; distributive, 7; machine shop, 3; and graphic arts, 2.

Fifty-eight of the 63 students who returned the surveys thought that a program of Indian arts and crafts should be included in the curriculum. This particular aspect had not been included in previous surveys except for the one to the people working with Indian adults. However, as a result of these two surveys, such a program should definitely be considered for inclusion to serve a two-fold purpose: to continue the traditions and culture of the Indians and as a vocational potential for them. The arts and crafts suggested included: silversmithing, 46; rugweaving, 42;

leatherwork, 39; basketweaving, 28; pottery, 20; Indian cooking, 3; and beadwork, 3.

It was further suggested that the leather work should include tanning and dyeing of leather. This had also been suggested by those working with Indian adults.

The students were asked if they had taken any vocational classes in high school. Thirty-four of them responded in the affirmative and mentioned the following classes: business education, 20; metalworking, 5; home economics, 9; vocational agriculture, 4; drafting, 2; building trades, 2; electrical, 2; auto body, 2; commercial art, 2; industrial arts, 3; and crafts, 4.

If they responded "no" to the above question, they were asked if they wished they had taken vocational classes in high school. Twelve of them responded "yes" to the latter question and indicated a desire for the following classes: business education, 3; building trades, 2; auto mechanics, 2; arts and crafts, 4; metalworking, 2; auto body, 2; drafting, 1; cosmetology, 1; home economics, 1; vocational agriculture, distributive, 1; commercial art, 1.

Summary of all surveys

Table 18 shows the combined results of all surveys with a final ranking of the programs. None of the survey groups were weighted in the final ranking because it was felt that, although the opinions were important, none of the groups had particular access to information which would make their opinions more valid than those of other groups. A total of 953 questionnaires were evaluated in the Blanding area and 510 in the Monticello area.

Table 18. Rank order of recommended programs at San Juan High School

Program	Student rank	Staff rank	Employer rank	Alumni rank	Adult rank	Indian adult rank	College student rank	Average rank	Final rank
Business education	2	3	1	5	1	1	2	2.1	1
Auto mechanics	1	1	3	3	6	2	4	2.9	2
Health occupations	5	4	8	1	2	3	3	3.7	3
Building trades	11	2	2	4	5	4	5	4.7	4
Home economics	3	5	11	6	3	7	6	5.9	5
Agriculture	9	6	9	13	8	6	1	7.4	6
Welding	10	8	5	11	7	5	8	7.7	7
Electronics	8	7	4	7	12	10	7	7.9	8
Cosmetology	4	11	12	2	4	15	10.5	8.4	9
Auto body	6	9	7	14	11	8	9	9.1	10
Commercial art	7	12	14	9	9	13	12	10.9	11
Machine shop	13	10	6	15	15	9	14	11.7	12
Marketing & dis.	15	15	10	8	10	12	13	11.7	13
Drafting	12	13	13	10	13	11	10.5	11.8	14
Graphic arts	14	14	15	12	14	14	15	14.0	15

It should also be noted that the questionnaires were not validated because the information requested was straightforward, matter-of-fact information. The questionnaires were evaluated by district administrators prior to their distribution to test their clarity, then revised as necessary.

Summary

San Juan County, Utah, is a scenic area whose economic future will probably hinge on tourism and light industry in addition to agriculture and natural resources. Each of these factors will require dedicated effort to promote and develop the required facilities to maintain it as an economic base. One of the major factors which limits the economic development of the area is its isolation--it is too far from major markets of many of the mass-consumption industries and the highway network serving the area is not adequate for transportation needs.

Approximately one-third of the county residents are Navajo Indians, most of whom live on the reservation. Their problems present special concerns in planning an educational program to serve area residents. It is anticipated that before 1975 over half of the students at San Juan High School will be Indian. Therefore, serious consideration must be given to their special interests and needs. Opinions presented by various authors indicate that many of the problems faced by the Indian students are the same as those faced by Anglo students and solutions to these problems will require a similar approach. However, an unique problem of Indian students is an acculturation factor--how can they be introduced to and accept the American economic system yet maintain the desired traditions of their own culture? The answer to that problem is

beyond the scope of this study, but some aspects of the problem must be seriously considered in planning a program of vocational education to serve their needs.

Projections of employment in the area indicate that most of the job opportunities will relate to construction occupations; secretarial occupations; service-repair occupations; metal, plastic, and electrical fabrication; health occupations; tourism trade; wholesale-retail trade; government; and possibly mining and agriculture. These projections relate closely to the vocational programs determined to be most beneficial as a result of community surveys. One program which would be unique to the area and which was recommended by a majority of Indian people surveyed is a program of Indian arts and crafts. This program could serve a two-fold purpose: to maintain the traditional crafts of the people and as a vocational potential. This program may very well help to alleviate the acculturation problem mentioned earlier.

CHAPTER IV

THE RECOMMENDED PROGRAM OF VOCATIONAL EDUCATION

The program was developed on a systems approach. Figure 4 shows a simplified flow diagram of the planning process and anticipated operation of the program.

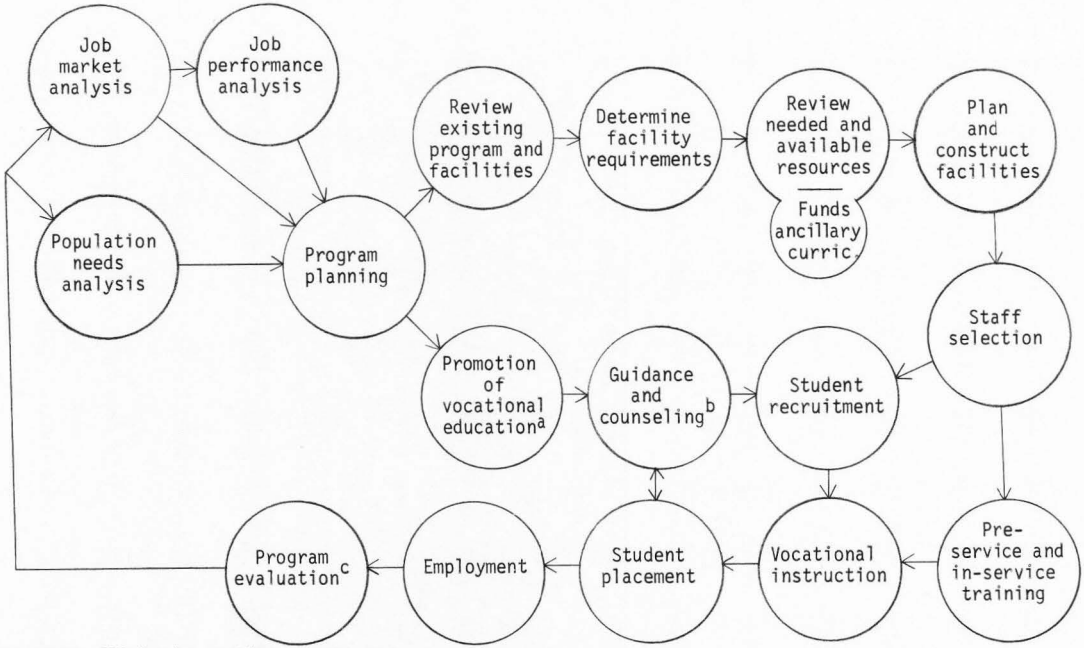
The Overall Concept

The concept is based on the idea that career choice is a process rather than an event--the student chooses a career as a result of many experiences, not just because he has reached a certain age or level of maturity.

Figure 5 shows a model of the proposed program. It follows closely the concept of career education described earlier (Chapter II) in that it is a continuum of orientation, exploration, and preparation on a K-12+ basis.

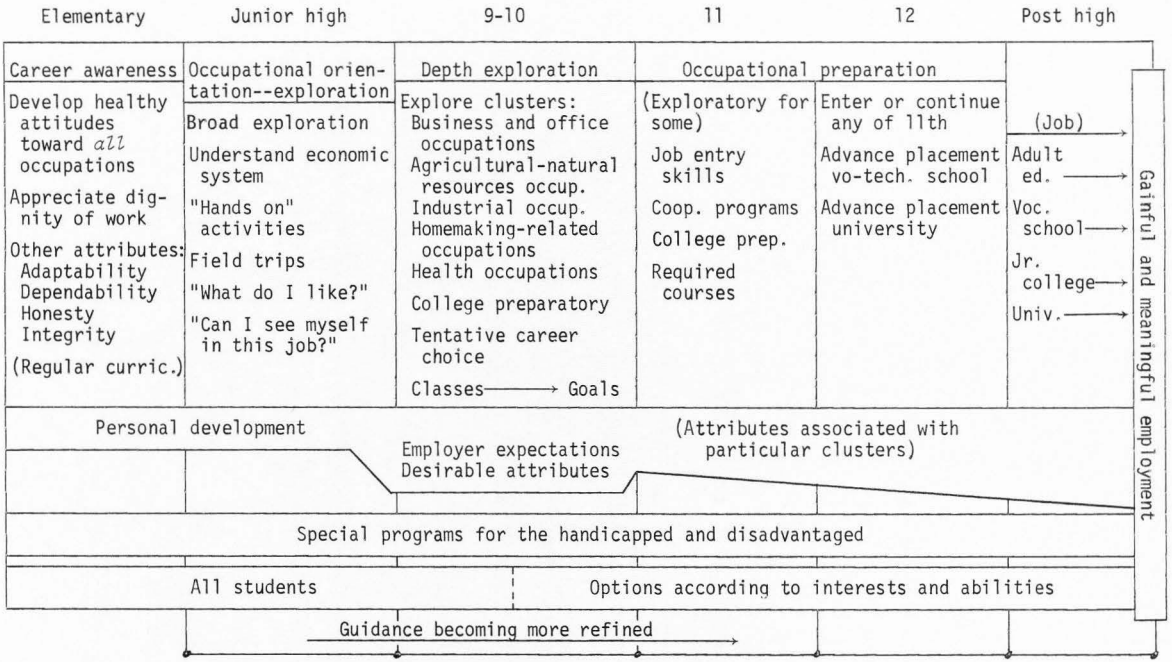
The model is self-explanatory in many aspects, but others need elaboration:

Junior high exploration. These activities would be a function of industrial arts and home economics classes which are required in the state of Utah. Activities would center around an understanding of the economic system, mass production, research and development in industry, and exploration into a variety of occupational options. The Industrial Arts Curriculum Project materials are viewed as a very realistic approach to this aspect. Although girls are not restricted from participation in



[a]Promotion will be in continuous process.
[b]Vocational guidance and counseling will be a continuous program on a kindergarten through job placement basis.
[c]Evaluation will be a necessary and vital phase of all functions of the program; however, the performance of individuals on the job is viewed as the ultimate evaluation of program effectiveness.

Figure 4. Flow diagram of vocational education planning and program operation.



Goal: The development of each individual to his highest potential through expanded career options and an education relevant to his needs and interests.

Figure 5. A model for career preparation.

the program, most will probably not take it so programs which provide adequate experiences for girls in home economics should be developed.

Introduction to vocations. A ninth grade one-semester orientation course aimed at student self-analysis associated with career choice and a study of employer expectations and desirable attitudes for employability. Students would explore broad occupational areas such as manual and mechanical occupations; clerical, sales, and service occupations; and professional, technical, and managerial occupations. The alternate semester could be utilized for exploration similar to tenth grade.

Cluster exploration. At the tenth grade level as a result of previous experiences, students would choose two clusters for in-depth exploration to help them make a tentative career choice by the end of the tenth grade.

There is no attempt to channel or track a student, but rather an attempt to provide him with a multitude of experiences from a variety of occupations to acquaint him with the numerous career options open to him. The intent is to provide him with the exploratory experiences sufficient to develop a tentative career choice so later classes can be directed toward his goals.

Some students will undoubtedly still be taking classes of an exploratory nature in the eleventh or twelfth grades. There should be no condemnation attached to such activity, although attempts should be made to guide the student to a well-informed and intelligent career choice. Other students will be involved in a variety of options including development of job entry skills, cooperative programs, and college preparatory programs. At the twelfth grade level, every attempt should be made to articulate programs with post-high school institutions so that

students in vocational programs may receive advanced placement in corresponding post-high programs.

Every student should have a marketable skill by the end of the twelfth, thirteenth, or fourteenth year or adequate training (coupled with adequate guidance) to enter a university for further education if he desires. Students should be encouraged to enroll in post-high education, but in the event of emergency or because of particular interests they should be prepared with a job entry skill in at least the lower-level jobs of a cluster upon graduation. Every attempt must also be made through relevant programs to encourage students to remain in school until they develop a job entry skill and then to continue their education as skills become obsolete or as their ambitions grow.

Throughout the continuum, students would be involved in a program of personality development. This would receive more emphasis at the ninth-tenth grade level when students would take the "introduction to vocations" specifically intended to acquaint them with desirable employability attributes and employer expectations of grooming, hygiene, and communication skills. During grades 11 and 12, these concepts would be expanded in relation to the particular clusters being pursued by the students.

Efforts would be made throughout the system to provide adequate programs for handicapped and/or disadvantaged students. San Juan School District in recent years has developed and conducted several programs for disadvantaged students. These would be expanded and integrated into a career emphasis concept and other programs would be evolved and cultivated as the need dictates.

A very important aspect of the overall program is the input of vocationally oriented guidance counselors. As a minimum, students would be counseled at the points indicated and at other times as appropriate. Instructional personnel would also have a continual responsibility for guidance of students in their programs especially as related to occupational outlook and progressive skill development.

The instructors and guidance counselors would work together as a team cooperating with social agencies to provide a job placement service for students. The guidance personnel would have the chief responsibility in directing this service, but could expect support and assistance from other personnel in the development and maintenance of the program.

The Program Structure

Figure 6 shows the proposed structure of the program for the San Juan Area Vocational Center. There will be five major departments: Consumer and Homemaking-Related Occupations, Business and Distributive Occupations, Health and Personal-Public Service Occupations, Agricultural and Industrial Occupations, and an Occupational Resource Center which will be basically a service rather than a facility, although provision will be made for a counseling, testing, and placement center.

It will be noted that some specific clusters in some departments are viewed as expansion programs. The rationale is that in the foreseeable future there will not be sufficient students at San Juan High School to warrant construction of facilities for all the intended programs. Effective planning, however, should anticipate expansion. Therefore, the proposed structure indicates possible programs for expansion realizing that modifications may be necessary to reflect future changes in employment

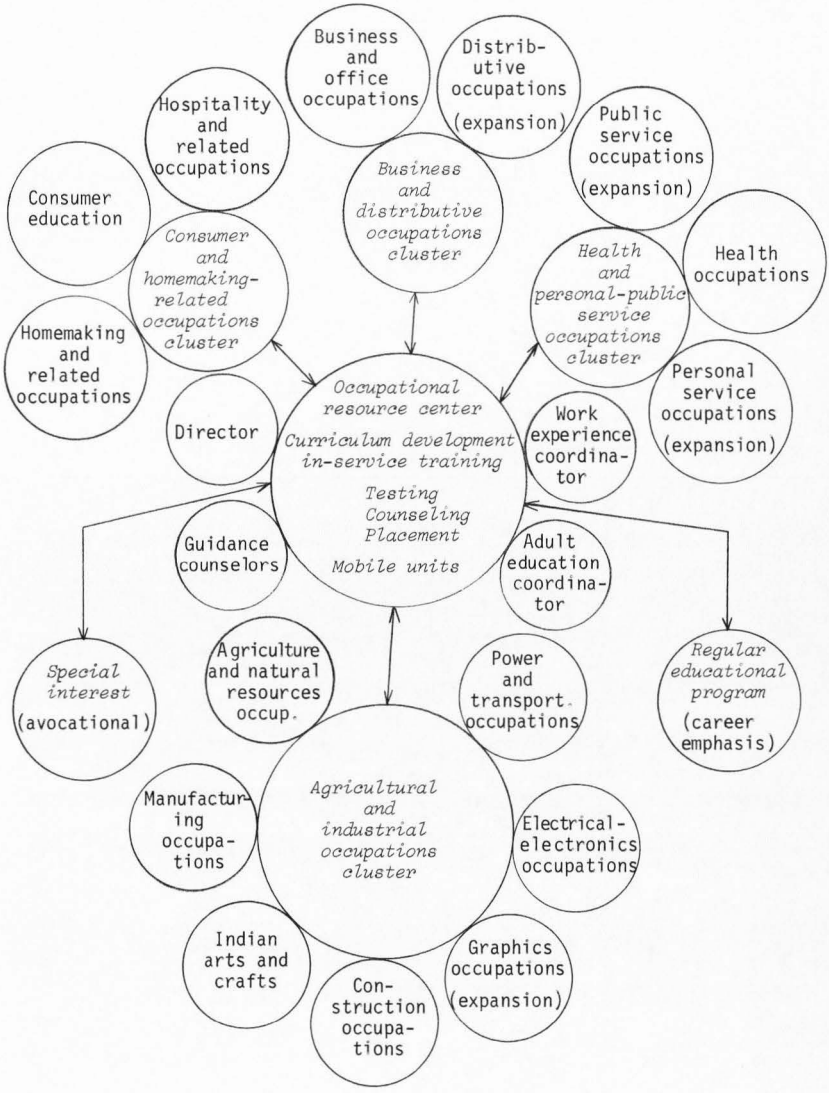


Figure 6. Structure of the proposed occupational educational program.

trends and/or other factors. It should also be noted that the intended programs will be very broad to encompass as many occupational areas as possible. There must be a delicate balance, however, between breadth of programs as an exploratory function and depth of programs as an employment preparation function.

While service-repair occupations is not isolated as a cluster, provision will be made in all areas (e.g., building trades and power mechanics) to stress the service-repair occupations and skills related to the areas.

Supportive Services

The effective and efficient development and maintenance of the overall vocational program will involve a variety of supportive services which must be carefully planned and subsequently sustained.

Inservice training

To assure that district personnel and school students are adequately prepared to effectively utilize the new facility upon completion, the following schedule is proposed:

Summer 1972. An inservice program for elementary teachers to acquaint them with the concepts of the career awareness program. One teacher from each elementary school is to be designated as a "lead teacher." The group of "lead teachers" will meet for a one-month period during the summer in a workshop session which will involve field trips, sessions with personnel from other career awareness programs, development and/or modification of curriculum materials, and other activities appropriate to the development of an adequate career awareness program for San Juan

School District. The entire elementary staff will meet in a one-week workshop session just prior to the opening of school. One day will be spent in a general session, the other four days will be devoted to sessions in the individual schools under the direction of the "lead teacher." Further sessions of inservice training and "lead teacher" group coordination will be conducted throughout the year as necessary.

The director of the San Juan Area Vocational Center should be hired to oversee the overall development and progress of the program, to write proposals for funding, to be involved in the activities necessary for the acquisition of equipment through federal government excess and national industrial equipment reserve programs, and to perform other duties pertinent to the planning and early operation of the center.

One instructor at each high school will be designated as an orientation specialist to spend the summer developing an adequate program of occupational orientation to be used as an "introduction to vocations" during school year 1972-73 to help prepare students to effectively utilize the programs of the anticipated facility. As before noted, this program will be used as a ninth grade one-semester orientation course, but during school year 1972-73 it will involve ninth, tenth, and eleventh grade students.

School year 1972-73. Programs of career awareness in the elementary schools and orientation in the high schools are to be operating.

Presently employed vocational teachers are to be developing and/or modifying vocational curriculum in preparation to entering the new facility. This will involve the development of behavioral objectives, learning packets, and planning for overall program operation.

The cooperative coordinator will make preparations for and publicize an anticipated cooperative education program for the following year.

Summer 1973. Elementary "lead teachers" will be involved in an evaluation and further development of the career awareness program.

Orientation specialists will be involved in evaluation and further development of the orientation program.

Vocational instructors will be further involved in program planning, purchasing equipment, and moving into the new facility.

August 25, 1973. The new San Juan Area Vocational Center will be complete and ready to open.

Other programs of inservice training and curriculum development or modification will be in continuous process on both short-term and long-term improvement projects after the opening of the center.

Promotion

An effective program of promotion must begin with the early planning activities. Newspaper articles, radio programs, and meetings with local groups have been conducted previously and will continue to be a part of the preparation process. The district mid-year institute on February 3, 1972, was a program to acquaint teachers and administrators with the career education concept and the anticipated program. Continued promotion of the program will be a function of the director, the instructors, and the advisory committees.

Advisory committees

A system of advisory committees would include provision for advising both administration and instructional personnel. It is therefore suggested that there be a seven-member committee composed of four lay citizens and

three high school students for each high school. Three members of each of these committees are to be elected to serve on a six-member district advisory committee. Three-member advisory committees consisting of two lay citizens and one high school student will serve the occupational clusters. The main duties of the advisory committees are to help assure an up-to-date and relevant instructional program and to assist in public relations and program promotion.

Student recruitment

Traditionally, student recruitment has been a major problem of vocational programs and they have received more than their share of potential dropouts and discipline problems. The proposed K-12 continuum with an emphasis on career preparation is viewed as a major advance in acquainting students with opportunities, thereby overcoming many recruitment problems. The success of the entire program hinges on effective orientation programs coupled with effective and efficient instructional programs at the advanced level. Therefore, with vital and vigorous programs, student recruitment is not viewed as a major problem, but continuous evaluation of program effectiveness will be a necessity. This can also be a function of program promotion by the advisory committees.

Program review and evaluation

The various clusters and the overall program should be under continuous scrutiny to assure their effectiveness and the relevancy of instruction. It is proposed also that the entire program should undergo a major evaluation every five years to update instruction as a result of a new survey of population needs coupled with an analysis of the job market and the occupational outlook.

Relevant instruction--realistic activities

These aspects are important in any program, but especially so in this area because of the Indian students who are not particularly oriented to the Anglo culture and economic system. Suggestions for specific programs or clusters include:

Vocational agriculture. Discussions with the school lunch supervisor indicate that a disproportionate amount of money is spent on meat for school lunch. Very little of the meat is purchased locally. It is assumed that many of the students who desire to enroll in vocational agriculture will not have the necessary accommodations for a livestock project. It is therefore suggested that a realistic experience with an associated chain of learning activities would be to construct (as a farm mechanics project) the necessary pens and shelter for possibly steers, hogs, and chickens. Agriculture students would keep complete records of the livestock projects. At the appropriate time the animals would be butchered and cut up in a special short course in meat cutting and the meat would be utilized in the school lunch program.

Power and transportation. One possible expansion, although not included in present programming, is the construction of a district bus maintenance shop attached to or adjacent to the vocational center. This could easily provide experiences for students interested in heavier mechanics who could be assigned to work with the maintenance supervisor in keeping fleet records and the normal mechanic activities. An associated facility would be a service center which could be operated as a service station providing experiences in business operation and record keeping.

Another pertinent aspect is a program of heavy equipment operation. Discussions with the county commissioners indicate a willingness to utilize county road machinery in the training of limited numbers of equipment operators. They have conducted similar programs in the past. Some heavy equipment may be available through government excess which could be available for use in vocational programs of operation and maintenance.

Distributive education--arts and crafts. As noted in the program structure (Figure 6), distributive education is viewed as an expansion program. Neither are facilities for arts and crafts to be included in present construction because there is already a program in operation and existing facilities can be remodeled to be adequate. In the future, the present facility may be utilized entirely by junior high students and expansion of the center would accommodate programs of distributive education and arts and crafts in adjacent locations.

As noted previously, one of the problems is that although many Indians have the necessary manipulative skills they do not have the necessary administrative skills to operate a business. Part of the distributive education complex would be a school store operated by the students. Students in the arts and crafts classes could purchase their supplies through the store, construct projects, and sell them back to the store as a retail outlet. Thus, students could participate in the entire cycle from the purchase of raw materials to the sale of the finished product, along with the associated bookkeeping, display techniques, and other business procedures.

Building construction. The most realistic traditional programs center around the construction of homes and summer cabins. This should be explored and utilized if possible. Other possible activities include

the construction of facilities for a Blue Mountain Environmental School, which is a summer program of environmental science operated by the district. Another very realistic activity would be to utilize the building construction classes in future expansion of the vocational center. This would be especially appropriate for advanced adult programs.

It is realized that there are problems to overcome in all of these or similar endeavors. However, the experiences provided for students warrant the exploration of various alternatives which will surmount the obstacles.

Mobile units

Distance will be a problem in conducting many programs of adult education. A system of mobile units is seen as a realistic alternative in the provision of vocational programs. The concept is that "shell" mobile units would be constructed by students in welding and building construction classes (again providing realistic experiences). These "shells" would provide accommodations for whatever program was viewed as being necessary at a remote location. In many instances, sufficient tools or equipment could be removed from the vocational center to operate a program in a mobile unit. In other instances, additional small tools or equipment would be necessary, but this concept would eliminate the duplication of expensive machinery and would also provide more flexibility than traditional mobile units designed for specific programs. One exception to this will be an electronics mobile unit which will alternate between sites at San Juan High School, Monticello High School, and other locations as necessary.

Cooperative programs

The main intent of a proposed diversified occupations cooperative education program is to offer educational experiences to those students who are interested in careers other than those for which training is provided in the vocational center. It must be realized, however, that such experiences are limited in a small community. Training stations in this category (from employer surveys) might include: floral arranging, horticulture, radio announcer, police training, meat cutting, dental assistant, beautician, data processing, hospitality occupations, photography, sales clerk, and refrigeration work. A secondary intent of a cooperative program would be to provide realistic on-the-job activities for other students as possible. Training stations in this category might include: nurse's aides, secretarial, service station, auto mechanic, welder, building trades, machine shop, drafting, T.V. repair, and small engine mechanic.

The utilization of time frames other than the normal one-half day on the job will be explored (for example: alternating days, alternating weeks, and alternating semesters).

Mini-courses

Another aspect which should be explored is the inclusion of mini-courses of various types to serve the special interests and needs of students.

Youth organizations

A youth organization is a vital part of the experiences of vocational students. Both federal and state level organizations exist for students in a variety of occupational fields: Future Farmers of America, Future

Homemakers of America, Distributive Education Clubs of America, Vocational-Industrial Clubs of America, Future Business Leaders of America, and Future Teachers of America. Although the local organizations are referred to as clubs or chapters and denote extracurricular activity, it is fundamental that the youth experiences in a club are supplemental to and definitely a part of curricular instruction. A program which deprives the enrollees of these student-directed activities is denying them a very valuable and desirable experience. Many of the students who are enrolled in these courses are the type who do not have the opportunity to be elected to student body officers or as officers in other student clubs. The organization of clubs within the vocational department allows these students the opportunity of exercising their leadership potential also. Therefore, youth clubs should be a definite part of the overall program.

Summary

The proposed program for the San Juan Area Vocational Center is developed around the career education theme described in Chapter II. The elementary grades will be utilized for programs of career awareness, junior high for programs of exploration of the American economic system, ninth and tenth grades for in-depth self-analysis and cluster exploration, and eleventh and twelfth grades for the development of job entrance skills or preparation for further education. An extensive guidance program is planned progressing from attitude development in early grades to job placement when the student leaves high school.

The program structure includes five basic clusters for immediate development and master planning for some programs within the clusters for anticipated expansion.

A schedule of events to be conducted during planning and construction of the center utilizes the year for inservice and preservice development of programs so that when the center is ready for operation in the fall of 1973, students and instructors will be prepared to make effective and efficient use of the facilities.

A program of continuous promotion will be a function of the director of the center, instructors, and a system of advisory committees. Advisory committees will also be involved in helping to plan programs and in review and evaluation of programs.

A very necessary part of program planning is the inclusion of realistic activities which provide concrete experiences of business operation and the utilization of skills.

"Shell" mobile units will be constructed into which will be placed equipment and furnishings for programs desired at remote locations. It is anticipated that two such shell units in addition to those already owned by the district will sufficiently serve the needs in the immediate future. A permanent electronics mobile unit will be designed for vocational programs at the two high schools and at remote sites as necessary.

Youth organizations should be an integral part of the program to help develop leadership potential in students who are not otherwise elected to offices in the student body and other clubs.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was undertaken as a field project as a result of a cooperative planning grant between the San Juan School District, the Utah State Department of Education, and the Four Corners Regional Development Commission. The grant was awarded to determine the most realistic program offerings for an area vocational center in San Juan County, Utah, and to develop the educational specifications for a new facility to house the proposed program.

Procedural aspects of the study involved:

1. A review of previous studies of the area to gain ideas pertinent to vocational programming.

2. Surveys of county residents to determine interests.

3. A review of information concerning the occupational outlook.

4. A review of literature concerning the need for vocational education and trends in vocational education.

5. Consultation with an advisory committee, district officials, state specialists of vocational education, and members of the author's graduate committee to determine the most appropriate overall program.

A review of literature indicates an abundance of information on the virtues of vocational education, with many authors suggesting that it may be a major portion of the solution to the ills of unemployment, drugs, militancy, and lack of concern which face the nation. Traditional

programs of vocational education will not provide the answer, but they provide the seed from which may germinate a new concept of more relevant education based on a continuum of career awareness, exploration, and preparation intended to dignify work and to develop employability skills and attributes among all students. That this concept will not provide all the solutions is recognized; however, it may well provide the foundation upon which other exemplary concepts can be structured.

A review of previous studies and present conditions reveals that the student population of San Juan County is expected to grow but the rate is unpredictable. During the seven years previous to this study, the enrollment of San Juan High School increased an average of 37 students each year with the two most recent years averaging 73 students per year. The recent increase in growth has been basically a result of a higher percentage of Navajo Indians attending school, principally public schools. A reduction of the rate of growth is anticipated in the near future, however.

Job opportunities showing significant growth potential for the area include occupations in construction, secretarial, service-repair, light manufacturing, health, wholesale-retail trade, and other employment related to tourism. The list of most popular vocational programs resulting from surveys of county residents compares quite favorably with the projections of most prevalent job opportunities.

In an attempt to determine the needs and interests of the county residents, several groups were surveyed with particular care in trying to secure opinions relevant to Indian needs. The surveys involved current high school students, district administrators and instructional

staff, employers, high school alumni of the past five years, adults, Indian adults, and Indian college students.

The overall survey results indicated most interest in basically the "traditional" vocational programs of business education, mechanics, building trades, home economics, agriculture, metalworking, and electronics with interest also in health occupations and cosmetology.

Over 90 percent of the current students said they would enroll in the classes in which they had expressed interest and over half of them said their main reason for enrolling would be to pursue an occupation related to the class. As might be expected, more Anglo than Indian students indicated an intention of attending a four-year university, while greater numbers of the Indian students anticipated junior college attendance or going to work after leaving high school.

Of particular interest in survey responses were the opinions of employers who still desire the "old-time virtues" of honesty, good attitude, dependability, and promptness in employees. Manipulative skills and personality traits were deemed of equal importance by a majority of employers. Over three-fourths of the employers indicated they would hire a recent high school graduate who had the traits and skills for their businessess and nearly two-thirds responded that they would hire a high school dropout with the attributes, although many of the responses were conditional. The employers expressed an interest in cooperative programs, with 62 responding that they would participate in the program and 37 being undecided.

Surveys of personnel working with Indian adults indicated that mobile units may be a very realistic approach in trying to include a larger proportion of county residents in vocational programs. A program of

Indian arts and crafts was also highly recommended both to maintain the traditions and as a vocational potential.

Alumni responses indicated that most employment opportunities were in the secretarial, cashier-clerk, and waitress occupations for young women and building construction, service station/mechanical, heavy equipment, and natural resources occupations for young men. Approximately one-fourth of the former students were attending four-year post-high institutions at the time of the survey.

One concern expressed by employers related to the instability of young people, and this proved to be a legitimate concern because nearly three-fourths of the jobs of the former students were for six months or less.

The surveys also indicated that the Indian population was basically interested in the same programs as the Anglo population, which made program planning much easier. One unique program which should receive consideration is an arts and crafts program oriented toward traditional Indian crafts.

The eventual program recommendations resulted from analyzing the review of literature, review of previous studies and the occupational outlook, and survey of county residents coupled with consultations with district personnel and the state specialists in vocational education. The philosophy of the author is also reflected in the proposed program.

Conclusions

The conclusions of the study are reflected in the proposed program and include the following:

Conclusions from data

1. The types of training desired by county residents include aspects related to clerk-secretarial, hospitality occupations, health occupations, electricity-electronics, construction, mechanical-repair, metal fabrication, and agricultural occupations.

2. The projected job opportunities in the county, state, region, and nation indicate most growth in occupations related to construction; secretarial; service-repair; metal, plastics, and electronics fabrication; health occupations; computer occupations; wholesale-retail trade; and occupations related to recreation and tourism.

3. Employer surveys indicate that personality traits are as important as manipulative skills in developing employability skills.

4. There was a high degree of interest in vocational programs among all groups surveyed.

5. Available resources and revenue mandate the prudent use of funds in the construction of facilities and in the operation of the program.

Conclusions from literature

1. Vocational education is an integral aspect of the educational system, but should not be stressed to the detriment of other worthwhile and necessary programs.

2. The most realistic programs of vocational education are based on a continuum of experiences on a K-12+ basis.

3. One goal of education should be the development of job entry skills and/or preparation for advanced training for every student upon completion of high school.

4. Instruction in vocational education should be linked to occupational clusters to promote instructional efficiency and correlation of learning.

5. Because of the background of Indian students, experiences must be provided throughout the school system to acquaint them with the economic system and the wide variety of occupations available.

6. The overall program of vocational education must make provision for effective counseling services throughout the K-12+ continuum including student self-analysis, selection of occupational interests, and placement following training.

Recommendations

Recommendations for the overall program of vocational education for San Juan County are reflected in the proposed program and include:

1. A program should be developed to provide adequate career awareness experiences at the elementary level. This is particularly important for Indian students who have not been exposed to the multitude of occupations in existence.

2. The Industrial Arts Curriculum Project materials should be explored for inclusion in exploratory programs at the seventh and eighth grade levels. Units which provide girls with an understanding of the American economic system should be available in home economics programs. There should be provision and encouragement to enroll both sexes in both programs.

3. The program should provide the opportunity for every student to develop a marketable skill by the time he leaves high school and also implant within the student a desire for continuous education.

4. A placement service should be an integral aspect of the vocational program. This is to be the culmination of a continuous program of guidance and student self-analysis.

5. Certificates should be issued to students to indicate their competencies. These could be correlated with behavioral objectives and instructional packets as an overall basis for program planning.

6. Occupations should be grouped in clusters of related occupations to assist students in correlating ideas and concepts. The clusters recommended include: homemaking and related occupations, business and distributive occupations, health and personal-public service occupations, and agricultural and industrial occupations, with each of these major groupings being divided into subclusters.

7. Service occupations should be stressed in those clusters where applicable.

8. The year prior to the completion of the vocational center should be fully utilized in preservice and inservice activities to more nearly assure that the center will be effectively utilized when completed.

9. A system of advisory committees should be established to assist in program promotion and evaluation. The committees should consist of lay citizens and high school students.

10. Every attempt should be made in all programs to provide realistic experiences which will increase the relevancy of instruction. An effective program of cooperative education will prove to be a valuable asset in this regard.

11. Youth organizations such as FFA, FHA, and VICA should be a part of the program.

12. Adjustments must be made in the regular school programs to provide for a career emphasis education for all students.

13. A very necessary aspect of vocational programs must be encouragement to young people to be more stable in employment. An adequate orientation program concerning occupational interests is viewed as one potential remedy to this problem.

Recommendations for Further Study

1. Other studies should be conducted which seek to further define vocational curriculum which is specifically relevant to the needs of the Indian population.

2. Other studies should be conducted which define methods of encouragement for economic investment and outlay in the county to expand the occupational opportunities.

3. The various "innovative programs in career education" should be studied to combine those elements which would result in ultimate programs of occupational education on a K-12+ continuum.

Discussion

As a result of this experience, a field study such as this is viewed as a very relevant educational endeavor which provides many realistic experiences. It is therefore recommended that field studies should be encouraged as graduate projects and that whenever possible, residency on-site should be required. Although distance becomes a problem, close articulation and cooperation between the graduate committee and the on-location staff is encouraged. This may be enhanced by having a member of the on-location staff serve as an ex-officio member of the graduate committee, especially where such staff hold advanced degrees.

PART II

EDUCATIONAL SPECIFICATIONS FOR SAN JUAN AREA VOCATIONAL CENTER, BLANDING, UTAH

CHAPTER VI

SPECIFICATIONS

School District Philosophy and Objectives

Education's major concern is preparing each individual to live effectively in a rapidly changing world. Since our democratic way of life is based on the recognition of the worth and dignity of the individual citizen and the promise that each person regardless of race, religion, or creed, is entitled to the greatest possible development of his abilities and talents, it is our primary objective to perpetuate, reinforce, and extend these concepts in our schools. We therefore list the following goals and objectives as our philosophy of education in the San Juan County School District:

1. Each student should develop a proficiency in the use of the modes of communication.

2. Each student should develop proficiency in the use of problem solving techniques and related computational skills.

3. Each student should realize the importance of the maintenance of good mental and physical health, achievement of a high level of personal fitness, and acquisition of wholesome leisure skills.

4. Each student should have a knowledge of fundamental concepts about the world environment and man's relationship to it.

5. Each student should have a knowledge of the interrelationships of nature and the cultural arts and the ability to utilize all the senses both to make aesthetic judgments about the total environment and to enrich his own life.

6. Each student should be provided with the necessary information and guidance so that a wise occupational choice can be made for adequate career development.

7. Each student should be provided with an opportunity to pursue an education relevant to his occupational interest including preparation in the academic area as well as vocational and technical education.

8. Each student should develop a dedication to the task of improving America, striving for solutions to its continuing domestic and world problems, and upgrading the lives of all people.

9. Each student should be provided with a variety of desirable and appropriate experiences for the development of the whole child, thus the curriculum should provide challenges and satisfactions for all students.

Introduction to the Educational Specifications

These educational specifications are not written with the intention of in any way hindering the architect and his judgment of good design. Rather they are intended to describe the function, environment, and desirable relationships as viewed by the staff and administration of San Juan School District.[1]

Room size and shape is left to the discretion of the architect (except as noted) to allow him to incorporate proper aesthetics, engineering principles, and economy of construction. The final design must meet all local, state, and federal codes for this type of building.

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[1]The actual educational specifications provided for the architect included other sections on community characteristics, general description of the program, and structure of the program. However, in this report such sections are superfluous, having been previously described in Part I.

Name of the Center

The name of the center shall be the San Juan Area Vocational Center.

Area to be Served

The center is designed primarily to serve the regular daytime students and the adults of the San Juan High School attendance area. In addition, students or adults may commute or be bussed from the Monticello area to take advantage of vocational programs which are not offered at Monticello High School. Of special concern are programs which will be applicable and adaptive to the Navajo Indians. One of the chief purposes of the aforementioned mobile units will be to provide supportive occupational programs in the outlying areas of the county.

Potential Enrollment for Vocational Programs

A study conducted by the Utah State Advisory Council on Vocational Education indicated that only 25 percent of the students who enter the ninth grade in Utah actually graduate from college with a B.S. degree or higher. The other 75 percent need effective education in vocational-technical areas if they are to secure satisfactory employment (Figure 7).

Conversely, reports by the State Board of Education indicate that 61.48 percent of Utah's high school graduates of spring, 1971, *intended* to go to college. This percentage is decreasing from 71.83 percent in 1970 and 70.87 percent in 1968. The high percentage showing intention of attending college indicates unrealistic planning of future educational goals and probably an unrealistic personal assessment of aptitudes, abilities, and interests. More adequate programs of career orientation

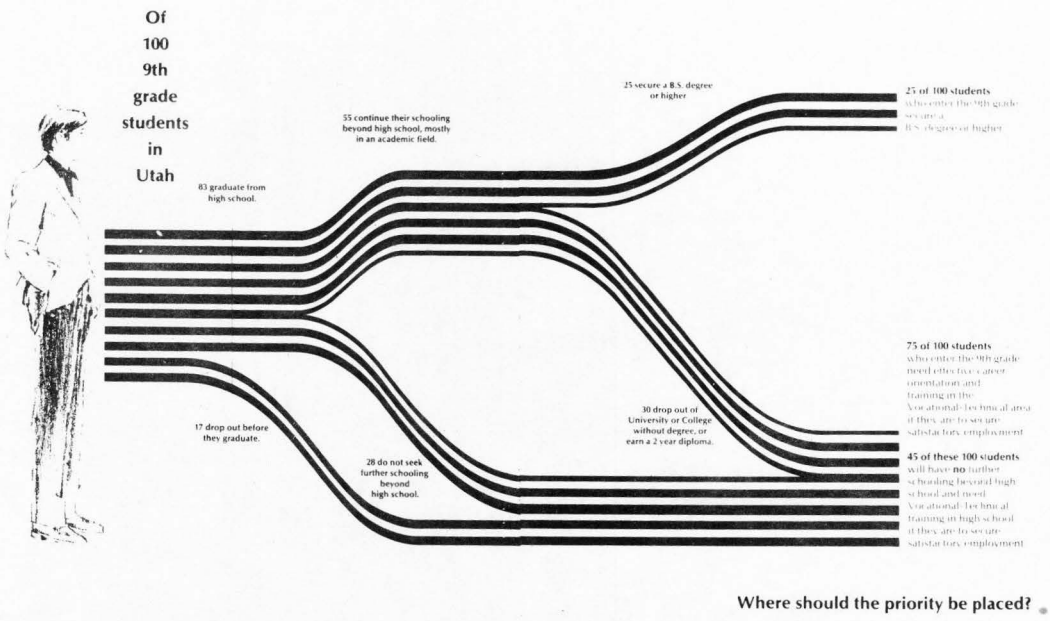


Figure 7. What happens to 100 students who enter the ninth grade in Utah. (Utah State Advisory Council for Vocational and Technical Education, 1970)

and exploration are needed to help the students more realistically plan their future beyond high school in line with their needs and desires. It is assumed that with such orientation and exploration programs, approximately two-thirds of the students would be involved in developing job entry skills during high school. Others would be taking classes in the vocational facility for personal interest or as a further exploratory function.

With this in mind, it is anticipated that approximately 110-120 students would be involved in vocational job-entry programs at Monticello High School (grades 9-12) and 240-260 in similar programs at San Juan High School. Other students on a personal interest or exploratory basis might include 50-60 students at Monticello and 70-80 students at San Juan. These estimates are based on current enrollments and will increase or decrease in line with enrollments.

Mark Nichols estimated approximately 150 adults would be involved in job-entry or skill improvement classes in the Blanding area (Sterling Institute, 1969). However, it is anticipated that with the use of mobile units and other provision for interesting programs in adequate facilities that a much larger number of adults would be involved.

Indications of possible growth at San Juan High School

Enrollment in elementary schools in the Blanding-south area.

1964-65	909
1965-66	814
1966-67	822

1967-68	885
1968-69	943
1969-70	1,039
1970-71	1,098
1971-72	1,186

Enrollment by grade level in the Blanding-south schools, October, 1971

The enrollment by grade level was as follows: kindergarten, 141; first grade, 184; second grade, 154; third grade, 172; fourth grade, 145; fifth grade, 134; sixth grade, 156; seventh grade, 147; eighth grade, 137; ninth grade, 122; tenth grade, 87; eleventh grade, 96; twelfth grade, 76.

Enrollment in San Juan High School

1964-65	393
1965-66	416
1966-67	441
1967-68	465
1968-69	499
1969-70	509
1970-71	573
1971-72	656

Site and Development

Three possible sites are currently under consideration for the new facility. Each of the sites with their apparent advantages and disadvantages will be mentioned:

1. West of San Juan High School. This is a strip of land on the hill immediately west of the high school building.

Advantages: (a) it is currently owned by the school district, (b) very little excavating would be required, (c) student access would be excellent.

Disadvantages: (a) it has no frontage and to acquire additional property to provide such is nearly prohibitive, (b) the long, narrow strip of land (180 feet by 450 feet) dictates a long building which restricts placement of interior spaces for most convenient access or relationships, (c) the construction of a large building in this area would make a very crowded campus, (d) a new building would be hidden behind existing buildings.

2. South of San Juan High School. This is currently a softball field used for physical education classes by the school and for summer community recreation.

Advantages: (a) it is owned by the school district (b) very little excavating would be required, (c) student access would be excellent, (d) there is ample space for parking and expansion, (e) it has very good frontage--corner of the block, (f) the shape (approximately 350 feet by 450 feet) lends itself to a variety of arrangements.

Disadvantages: (a) there is strong community sentiment against the construction of the vocational center on this property (taking away

the recreation facilities), (b) the ball park is lighted and removal of such would increase the cost of using the land (if the school district were to provide alternate facilities for the ball park, perhaps the hostility would be reduced), (c) the use of this site restricts further expansion of the high school complex if such becomes necessary.

3. East of San Juan High School. This is currently a brush area across the street from the high school.

Advantages: (a) the district has approved purchase of the land, (b) the size and shape of the land (720 feet by 829 feet) are ample for a variety of arrangements and also for expansion, (c) it has good frontage, (4) construction on this property would provide more of a separate identity to the center rather than as an addition to the high school (this may or may not be viewed as an advantage, depending on philosophy).

Disadvantages: (a) use of the site would require excavation which would increase the cost of construction, (b) students would have to cross a street which is quite busy at certain times of the day (closing the street or making it "limited access" is not too realistic as it is a main road leading north from town), (c) students would have to walk further to attend classes in the center; student access would be rated as "good."

Comment: The softball area and the undeveloped area across the street are regarded as being equal as sites for the new center. The softball area would be more accessible to students, but community sentiment is strongly against such use. The main advantage of the site across the street is that it could provide a separate identity for the center. This is not viewed as a necessity now, but may be an advantage

in the future. The main disadvantage is that students would have to cross the street; this, plus the longer distance, makes it less accessible to students.

The site recommended by the architect, the state administrator of vocational education, and ultimately chosen by the Board of Education, was the site across the street. Choice was made as a result of the recommendations, community sentiment, and because of the greater possibilities for expansion.

Funds Available

One of the greatest problems to overcome in educational planning is the acquisition of funds for construction and operation once the planning is complete. In the original planning agreement between the three agencies involved, the following amounts were verbally allotted:

San Juan School District	$100,000.00
State Department of Education	100,000.00
Four Corners Regional Commission	150,000.00
Total	$350,000.00

In looking at other vocational facilities in the state and their construction costs, this amount appears insufficient for the building required to adequately house the programs which will be offered.

Upon recommendation of the Advisory Committee, the Board of Education has approved the inclusion of programs which will require a floor space of approximately 19,000 square feet. In line with this, the superintendent has written a letter to the State Department of Education stating that anticipated construction at $25.00/square foot will require approximately $475,000 and requesting the State Board of Education and the Four Corners

Regional Commission to make a commitment as to the extent they will participate in construction. Reply is forthcoming, but as yet no additional commitments have been made.

Projected Operational Expenses of Center

Instructional:		
Salaries:		
Director	$10,000.00	
Consultants	2,000.00	
Teachers	60,000.00	
Teacher leadership	4,000.00	
Guidance	8,000.00	
Substitute teachers	1,000.00	
Extended day teachers	5,000.00	
Total salaries (subtotal)	$90,000.00	
Textbooks	$ 2,000.00	
Library books	200.00	
Periodicals	200.00	
Audio-visual	1,500.00	
Teaching supplies	4,000.00	
Total expenses for instruction		$ 97,900.00
Operation of plant:		
Salaries (one-half time custodian)	$ 3,000.00	
Fuel or heat	2,000.00	
Other utilities	2,500.00	
Supplies	1,000.00	
Total operation of plant		$ 8,500.00
Maintenance of plant:		
Salaries	$ 2,000.00	
Contracted services	1,500.00	
Equipment replacement	2,000.00	
Supplies and other expenses	1,500.00	
Total maintenance of plant		$ 7,000.00
Fixed charges:		
State retirement	$ 400.00	
Social Security	450.00	
Property insurance	1,000.00	
Health insurance	2,000.00	
Other insurance	500.00	
Total fixed charges		$ 4,350.00
Projected annual operational expenses		$117,750.00

Organizational Pattern

The organizational pattern for the San Juan Area Vocational Center is shown in Figure 8.

General Building Design

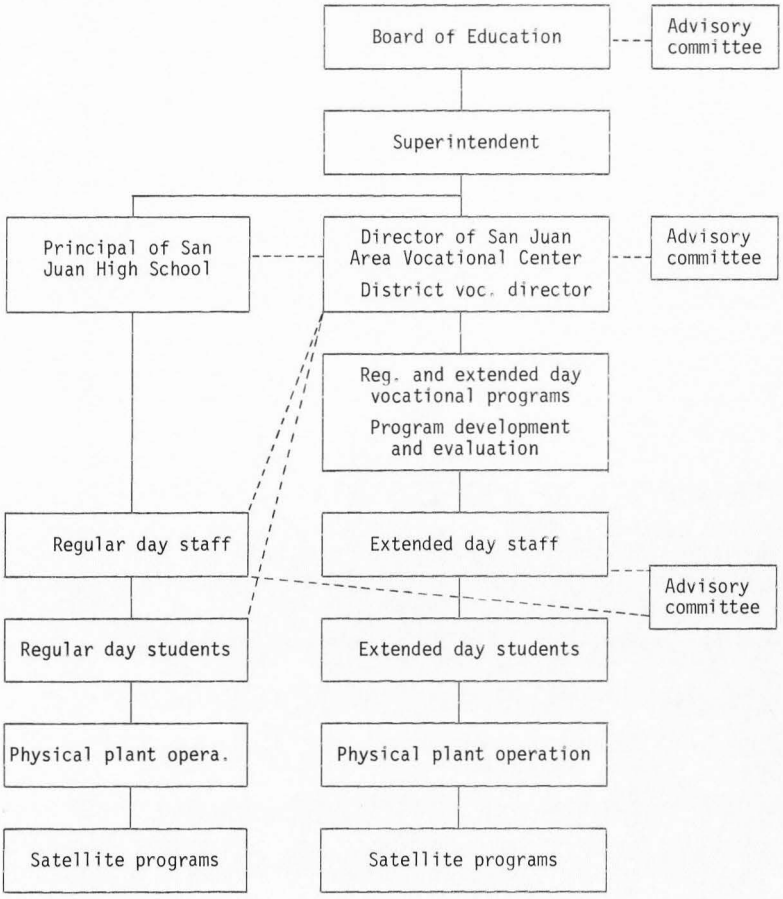
Whichever site is ultimately chosen, consideration must be given to having the design of the new building blend in with the design of existing structures as well as suited to the topography and scenic qualities of the area. The actual shape of the building and the internal arrangement of spaces are left to the discretion of the architect, giving due consideration to the specifications elsewhere described. In general, however, the shop-laboratory areas should be physically or acoustically separated from the administrative, classroom, and classroom-laboratory areas.

Future Expansion

The possibility of future expansion must also be considered. Allowance must be made for possible expansion in both the shop-laboratory area and the classroom-laboratory area. Specific programs for future expansion are described elsewhere.

Guidance Program

There should be provision to assure that every student gains expert help in assessing his personal interests, aptitudes, and abilities in making a career choice and in planning an appropriate educational program.



Legend: Solid line ——— Direct line of authority.
Broken line ---- Cooperation.

Figure 8. Organizational pattern for San Juan Area Vocational Center.

The total program of occupational education on a K-12+ basis necessitates effective counseling service at the elementary level for an orientation to the world of work with emphasis on the development of positive attitudes toward all occupations. The counselor (career development specialist) can work with elementary teachers in selecting activity-centered projects, in procuring supplies and materials relevant to the guidance function, and in bringing resource persons into the classroom.

The career development specialist would also work with teachers in the intermediate grades and high school in helping to make instruction more relevant to student needs. Further involvement in the normal programs of testing would also be necessary, emphasizing attitude scales and interest inventories. A major responsibility at the junior high level will be to help all students determine general, though tentative, career goals. Students at the high school level, although not expected to set specific goals, should be directed toward a broad field of interest, with their career choice becoming more refined through further exploration and preparation as they progress through the grades.

The career development specialists must have an orientation toward a wide variety of occupations and must have the equipment and materials to successfully guide students toward appropriate careers (with the help of the instructional staff).

Another major concern is a placement program wherein the specialist works closely with manpower agencies, business personnel departments, university and technical school admissions offices, and other agencies which may be involved with the students after leaving high school. Along with other personnel of the center, the career development specialists

will be intimately involved in the follow-up of graduates to determine the success of their preparation.

Scheduled Date of Occupancy

The center is expected to be fully equipped and ready for opening at the beginning of the school year (approximately August 25) 1973. The construction schedule should allow for the necessary clean-up and equipping prior to this date.

Total Staff Anticipated

It is anticipated that there will be seven instructors in the new center for regular daytime programs and possibly other instructors for adult evening programs as necessary. There will also be a director, a vocational counselor, and a receptionist's area which will be staffed by business education students. Most of the instructors are currently employed by the district and will be involved in plan approval. Future growth may include two other instructors without additional construction.

General Considerations

Some provisions are basic to all areas and are hereby presented to avoid unnecessary duplication in connection with the further description of each separate area.

Location and housing

1. The site for the proposed new facilities should be adjacent to the existing San Juan High School buildings. It should also be accessible for evening school use.

2. The site should be easily accessible by automobile and truck and the buildings so located on the site that they will not hinder the orderly flow of traffic.

3. Adequate parking should be provided.

4. Shop-laboratories should be located so that the noise will not disturb other educational activities.

5. Facilities for auto-power mechanics, building construction, and other laboratories that must be accessible to trucks or automobiles should have service entries and exits located adjacent to driveways for easy access.

6. Outdoor areas for auto mechanics and building construction should be screened from public view.

7. The new facility should be a one-story structure.

8. Ceiling height in shop-laboratories should be a minimum of 12 feet, preferably 14 feet. Additional height for a car hydraulic hoist or for vertical material storage should be provided when necessary.

9. Laboratories should be finished with materials which are easily cleaned and which will permit repeated refinishing.

10. The facility and installations must meet the standards set by the Utah State Department of Education, the State Fire Marshall, and the Division of Industrial Safety.

Flexibility and expansibility

1. The site chosen for the new facility should be large enough and the facility so located on the site to allow future expansion.

2. The open-planning concept should be used where possible to achieve greater flexibility.

3. Non-bearing partitions may be used between shops/laboratories to obtain flexibility.

4. Interior hallways and corridors should be continued to exterior walls wherever extensions are possible.

5. Installations for power and other utilities should be based on a liberal rather than on a restricted estimate of future needs.

6. The facility should be planned for the use of standard types of lockers, cabinets, shelves, and work benches.

7. Shelving in cabinets, lockers, and other areas requiring shelves should be adjustable except where safety dictates rigid shelving.

8. Windows should be kept to a minimum, and in most instances above eye level.

Interior use of space

1. The entire laboratory should be visible from any point.

2. Arrangement of furniture, equipment, machines, and student stations should be determined by considerations for safety, work procedures, flow of materials, and instructional efficiency.

3. Aisles of travel should be provided for free flow of traffic between all areas and points of common use, such as auxiliary rooms, student storage, tool panels, and common machines.

4. Spacing between furniture, benches, machines, and other equipment should be sufficient for safety and free passage. The space necessary is determined by the nature of the furniture or equipment, but in all instances should be at least three feet.

5. Operator's zones around machines in shop-laboratory areas should be taped, painted, or otherwise permanently indicated on the floor.

6. All laboratories should have at least two entrance-exit doors. One of the doors should be large enough to accommodate the largest piece of equipment or instructional project which will be moved in or out of the facility.

7. Open floor spaces should be provided near entrance-exits to eliminate congestion.

8. A clear floor space should be provided in front of tool panels and common machines or equipment.

9. Special racks and shelving should be provided for the storage of materials (e.g., lumber and bar steel) where such storage is necessary.

10. Furniture, machines, and equipment should be placed to allow easy cleaning of the floor.

11. Illuminated display cases should be provided in each laboratory area and in other central locations in the building. These display cases should be provided with lock and key, and with three or more adjustable shelves. They should be backed with tackboard, corkboard, or peg board; should be well lighted; and should be of sufficient size to accommodate models as well as other types of displays.

12. The building should be planned on an open concept for maximum use and flexibility of space with a minimum of space devoted to hallways, corridors, etc.

Visual comfort and efficiency

1. Daylight should be supplemented with sufficient electric light to provide illumination that meets adopted standards in each area.

2. Artificial light should produce uniform distribution of shadow-free light, and equipment and walls should be glare-free.

3. General lighting should be supplemented by special lighting for machines or other areas where precision work is done.

4. The color scheme of the laboratories and furnishings should be conducive to eye comfort and safety.

Other general considerations

Provision should be made for the following in each teaching area:

1. A minimum of 8 lineal feet of chalkboards of medium brown or medium green color.

2. Tackboards with a minimum of 8 lineal feet which may be divided into 4-foot sections.

3. Map rail with hooks above every chalkboard and tackboard.

4. A daylight screen mounted on wall or ceiling.

5. A first-aid kit in a prominent location.

6. Baffling or other noise control in multiple use areas.

7. Consideration for the needs of the handicapped in the placement of railings, ramps, drinking-washing facilities, or other physical facilities which they may use.

8. A two-way communication system linked with the administrative office in the building and with the main office at San Juan High School.

9. An electric wall clock in each area.

10. Drapes of any approved type to be used for darkening for the use of visual aids.

11. All counter tops to be covered with a water and stain-resistant finish or covering.

12. All door closures to be located at the tops of doors.

13. A flag holder in each area.

14. A pencil sharpener in each area.

15. Space for storing textbooks and other instructional materials.

16. Two or three-way electrical switches by each door as needed.

17. Provision for mechanical exhaust of dust, smoke, odors, fumes, vapors, and gases.

18. The heating-cooling system should automatically maintain a temperature of 68° measured 60 inches above the floor in the shop-laboratory areas and 70° measured 30 inches above the floor in the classroom-laboratory areas. Temperature controls should permit the heating/cooling of separate areas such as in the case of night classes when only part of the building is in use.

19. Power in each area should be controlled by a master panel that can be locked and is easily accessible. Remote safety switches controlling the main power supply may also be provided.

20. Space should be set aside where necessary for waste and refuse containers.

21. Adequate washing facilities and a drinking fountain should be located in each laboratory.

22. Fire extinguishers must be conveniently located and conspicuously marked.

Custodian storage

A space of adequate size for the storage of custodial equipment and supplies should be provided with convenient access to the entire facility. Shelving, working space, and storage space should be arranged for easy access and convenience. The space should be provided with a deep sink, hot and cold water, and adequate lighting. Good ventilation

is required to prevent spontaneous combustion and because of the nature of the supplies.

Toilet facilities

Toilets should be centrally located with entrance from a hallway. Entrances to male units should be sufficiently separated from female units. Arrangement of doors, vision screens, etc., should preclude any direct line of vision to toilet and/or urinal stalls from the entrance.

Provision must be made for adequate lighting, electrical outlets, sinks, towel holders, soap dispensers, mirrors with shelf for personal effects, containers for disposal, and impervious flooring with good drainage.

All surfaces should emphasize ease of maintenance, sanitation, and protection of health. They should also be aesthetically pleasing and the ease of supervision must be considered.

List of Facilities to be Provided

It is anticipated that the following programs will be included in the new facility. The approximate area and auxiliary spaces for each program are also suggested.

1.0 *Power-transportation and metalworking laboratory.*

Area: Approximately 4,000 square feet *plus* auxiliary areas.

Project storage	250 square feet
Welding gas storage	35 square feet
Instructor's office	200 square feet
Classroom	700 square feet
Men's restroom	100 square feet

Women's restroom	35 square feet
Technical equipment storage	100 square feet
Auxiliary area total	1,420 square feet
Outdoor work-storage area	10,000 square feet

2.0 *Building trades--industrial plastics laboratory.*

Area: Approximately 2,400 square feet *plus* auxiliary areas.

Project storage	250 square feet
Material storage	250 square feet
Finish room	150 square feet
Auxiliary area total	650 square feet

(Instructor's office, classroom, restrooms, outdoor area to be used in cooperation with power-metalworking laboratory.)

3.0 *Vocational agriculture classroom--laboratory.*

Area: Approximately 1,200 square feet *including* auxiliary area.

Classroom	930 square feet
Laboratory	150 square feet
Office--storage	120 square feet

4.0 *Business education and office practice laboratory.*

Area: Approximately 4,000 square feet *including* auxiliary area.

Typing area	1,000 square feet
Bookkeeping-shorthand area	800 square feet
Business machines	400 square feet
Simulated office	600 square feet
Classrooms (two combined)	900 square feet
Office--workroom	300 square feet

5.0 *Home economics-health occupations laboratory.*

Area: Approximately 4,000 square feet *including* auxiliary area.

Food and nutrition	1,500 square feet
Clothing and textiles	1,300 square feet
Child care and family life	1,080 square feet
Possible office	120 square feet

6.0 *Administrative-reception area.*

Area: Approximately	525 square feet including:
Entry reception	175 square feet
Director's office	150 square feet
Counseling-testing office	200 square feet

Other auxiliary areas.

Area: Depends on building layout but must include:

Janitor storage	Approximately 120 square feet
Furnace room	Approximately 200 square feet
Restrooms	Approximately 300 square feet
Corridors	Not known

7.0 *Drafting laboratory.* Tentative for expansion.

8.0 *Indian arts and crafts laboratory.* Tentative for expansion.

9.0 *Distributive education laboratory.* Tentative for expansion.

10.0 *Mobile units.*

Summary of spaces:

Power-metalworking	4,000 square feet
Auxiliary area	1,420 square feet
Building trades	2,400 square feet
Auxiliary area	650 square feet

Vocational agriculture	1,200 square feet
Business education	4,000 square feet
Home economics	4,000 square feet
Administrative	525 square feet
Total	18,195 square feet
Auxiliary spaces	Unknown

In each case, the figure shown is considered to be the maximum figure. If, through judicious planning and arrangement a smaller space may be shown to adequately house the activities anticipated, the space size should be decreased correspondingly. *In any event, the total floor space of the vocational center should not exceed 19,000 square feet.* The planning should stress economy of construction using materials and designs which are practical, efficient, and labor saving. This is not to suggest that the building should be unattractive or cheap, but rather that "frills" should be minimal.

Possible Programs for Expansion

1.0 *Drafting laboratory.*

Area: Approximately 2,000 square feet including auxiliary area.

2.0 *Arts and crafts laboratory.*

Area: Approximately 2,500 square feet including auxiliary area.

3.0 *Distributive education laboratory.*

Area: Approximately 1,500 square feet including auxiliary area.

4.0 *Metalworking laboratory.*

Area: Approximately 4,000 square feet including auxiliary area.

5.0 *Auto body repair laboratory.*

Area: Approximately 4,000 square feet including auxiliary area.

6.0 *Personal service laboratory.*

Area: Approximately 2,000 square feet including auxiliary area.

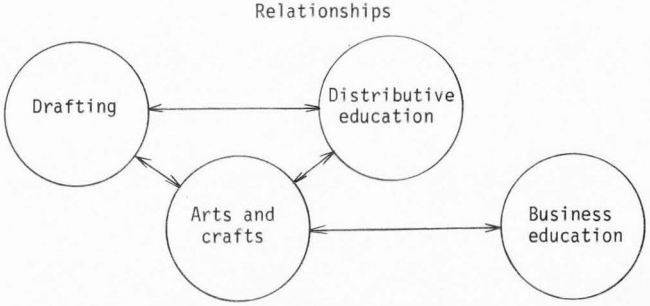
A suggestion might be appropriate as to the relationship between anticipated expansion and programs which are currently planned. These suggestions are not intended to interfere with good planning nor dictate the arrangement of currently anticipated construction. However, if provision for such expansion can be worked into present plans, expansion will be more convenient and orderly.

If possible, expansion programs in drafting, arts and crafts, and distributive education should be closely related to each other with the drafting and crafts in nearly an "open" relationship. The distributive education should be adjacent because of the possibility that crafts and drafting supplies will be purchased through a small school store operated by the distributive students. There should also be convenient access from arts and crafts to the business education department, if not an immediately adjacent location. Tentative educational specifications for these expansion programs are included herein to inform the architect of program requirements, even though such expansion is not anticipated in the foreseeable future.

The possible expansion of metalwork and auto body repair should be closely related to the power-transportation and metalwork laboratory.

Expansion into personal service occupations, although not directly related to other programs, should have convenient access to the home economics laboratory if possible. Expansion into this program might include construction of a personal service-health occupations laboratory to more adequately provide for health occupations (in which case the size of the laboratory would be increased).

Preliminary drawings by the architect might include the outline of these expansions to show relationships to anticipated construction as follows:



Possible Programs in Mobile Units

Some programs will be taken to outlying areas of the county in mobile units and where possible, equipment will be taken from the laboratories to equip temporary mobile programs. The following programs seem most logical and should be considered:

1. *Home economics.* To include sewing with portable machines, family health, consumer education, and food preparation if possible.

2. *Business education.* To include secretarial training and business management related to owning and operating small businesses.

3. *Vocational agriculture.* This program may be considered; however, there are currently several agencies conducting such programs.

4. *Metalworking.* To include welding and limited metal machining.

5. *Building trades.* To include rough and finish carpentry, plumbing, and electrical wiring.

6. *Auto mechanics.* Initially to include basic auto care and tune-up. May be expanded into actual mechanics.

7. *Drafting.* To include all phases of drafting.

8. *Electronics.* A permanent electronics unit will be available at times other than when it is serving the two high schools.

9. *Arts and crafts.* To include silversmithing, rug weaving, leather work, ceramics, and other crafts programs as necessary.

10. *Other programs.* To be developed as the need dictates.

Outline of Educational Specifications

1.0 Name of program or area.

- 1.1 General space description.
  - 1.11 Number of students.
  - 1.12 Number of faculty.
  - 1.13 Area requirements.
- 1.2 Type of activities anticipated.
- 1.3 Location and traffic circulation.
- 1.4 Major equipment to be housed in the area.
- 1.5 Auxiliary rooms.
- 1.6 Storage.
- 1.7 Audio-visual and other teaching aids.
- 1.8 Utilities.
- 1.9 Environmental considerations.
  - 1.91 Visual.
  - 1.92 Spatial.
  - 1.93 Acoustical.

1.94 Flexibility.

1.95 Thermal.

1.10 Special considerations.

Detailed Room Descriptions

1.0 Power-Transportation and Metalworking Area (including Agricultural Mechanics).

1.1 *General space description.*

1.11 Number of students. The area should accommodate 24 beginning students or 18 advanced students at any one time with an approximate load of 90 students per day. It is anticipated that through growth and the possibility of this becoming a two-teacher area, approximately 30 students could be served at a time and the daily load would be 150 students.

1.12 Number of faculty. In the immediate future, one teacher will teach both mechanics and metalworking. However, as the programs grow a teacher may be required in each program.

1.13 Area requirements. A floor space of approximately 4,000 square feet plus auxiliary rooms for storage will be required. Approximate shape of 50 feet by 80 feet is preferred.

1.2 *Type of activities anticipated.* It is anticipated that the area will house both beginning and advanced courses in the power and transportation occupations--basically automotive mechanics, but also the broader scope of power mechanics

including limited introduction to diesel and other types of combustion engines and various methods of power transfer. Beginning and advanced courses in the metalworking trades of gas and electric welding, machine trades, and sheet metal will also be offered in this area on a somewhat limited scale. The various aspects of agriculture mechanics which are pertinent to this laboratory will also be included and some class periods will emphasize these aspects.

1.3 *Location and traffic circulation.* This laboratory should be located on the end of a wing in view of the fact that future expansion may include other closely related laboratories such as body and fender repair or a separate metalworking area. This facility should be located to provide easy access of service vehicles as well as the cars, trucks, and other equipment which will be serviced in the laboratory. The laboratory must also be situated so that an adjacent outdoor work and storage area can be screened from public view.

The laboratory location should provide easy student access from other areas of the new facility as well as from the existing high school complex.

1.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

1.41 Power transportation:

Item	Approximate size[1]	Utilities
1 two post hoist (rear post movable)		Air

[1]Width, length, height.

Item	Approximate size	Utilities
1 Air agitated solvent tank	22" X 44" X 38"	Air, 115 V
1 Spark plug cleaner and tester	1' X 2' (benchmount)	Air, 115 V
1 Valve and seat grinder	2' X 3' X 4'	115 V
1 Air compressor	2' X 4' X 42"	3ph, 230 V
1 Engine analyzer	2' X 3' X 5'	
1 7" Grinder	15" X 24" X 48"	3ph, 230 V
1 15" Drill press	18" X 24" X 6'	3ph, 230 V
1 Armature lathe w/undercutter	15" X 30" (benchmount)	115 V
1 Battery charger	13" X 15" X 36"	115 V
1 (ea) Arbor press 20T and 1½T	2' X 3' X 6'	
1 Steam cleaner	24" X 48" X 48"	Water, 115 V
1 Medium size diesel engine/stand	2' X 4' X 42"	
1 Stand for cut-away differential	2' X 2' X 42"	
1 Stand for cut-away standard trans-mission	2' X 2' X 42"	
1 Stand for cut-away automatic transmission	2' X 2' X 42"	
2' wide metal-top work benches of appropriate length placed in strategic locations		
1 Outboard motor stand	3' X 4' X 3'	

Item	Approximate size	Utilities
1 Small engine test stand/dynamometer	22" X 44" X 45"	Water, exhaust
1 waste oil drain can	18" X 18" X 45"	
1 Gear lube dispenser	18" X 18" X 44"	
1 Chassis lube dispenser	18" X 18" X 36"	Air
1 Transmission jack	2' X 3'	
1 Portable crane	3' X 6' X 6'	
2 Tool cabinets	18" X 8' X 7' (open)	
1 Pneumatic portable lift	24" X 30" X 42"	Air
2 Hydraulic floor jacks	12" X 48"	
1 Engine test stand	26" X 67" X 50"	
100 Student wall lockers	12" X 15" X 21" (ea)	
4-6 Car stalls	10' X 20'	Exhaust

Note: Diagonal car stalls are preferred. Each stall should be equipped with:

1 Metal top work bench 30" X 72" X 36" having locked door storage beneath

1 Tool panel having a basic set of hand tools

1 Engine stand 24" X 42" X 36"

1 50' Drop cord reel

1 Duplex outlet

1 Compressed air outlet

1 Metal vise (3½" jaw)

1.411 Optional or alternate equipment

Item	Approximate size	Utilities
4 Work bench and locker	2' X 12' X 30" (ea)	
Test area for rocket, jet, and gas turbine engines		
1 Brake drum lathe and service unit	2' X 42" X 55"	115 V
1 Complete operational chassis--less body		
1 Test engine/dynamometer	4' X 6' X 5'	
1 Tire mounting machine	2' X 3' X 3'	Air
1 Static tire balancer	2' X 2' X 3'	

1.412 Other necessary facilities

Exhaust system for running engines	
Drain trough through complete length (width) of floor	
1 Mono-rail w/2T hoist (to be located to be of maximum use and service)	
50' Electric drop cords w/recoil reels near car stalls as indicated previously and at other strategic locations	115 V
12 Lineal feet bookrack for parts catalogs and service manuals	

1.42. Metalworking

Floor space must be allowed for the following equipment and/or furnishings:

1.421 Welding

Item	Approximate size	Utilities
4 Oxy-acetylene booths	38" X 4' - 2' shelf	Oxy-acet, exhaust
6 Arc welding booths	38" X 4' - 2' shelf	230 V, exhaust
1 Quench tank	2' X 4' X 2'	
1 Cutting welding table	3' X 3' X 3'	
2 Portable oxy-acetylene	18" X 2' X 4'	
1 Gas engine arc welder/ generator	2' X 4' X 48"	
1 100# Anvil	2' X 2' X 30"	
1 Ironworker	30" X 48" X 7'	
1.4211 Optional equipment		
1 MIG welder	2' X 3' X 3'	230 V, 3ph

1.422 Sheet metal

Item	Approximate size	Utilities
1 Spot welder	2' X 3' X 5'	220 V, water
1 Squaring shear 36"	3' X 42" X 42"	
1 Box and pan brake 36"	18" X 42" X 42"	
1 Slip roll 30"	18" X 36" X 42" (bench)	
1 Bar folder 36"	18" X 42" X 1' (bench)	
1 Universal bender	2' X 2' X 3'	Large open space in front
1 Combination rotary machine	12" X 18" (bench)	

Item	Approximate size	Utilities
1 Soldering bench	24" X 48" X 30"	Gas
3 Work benches	40" X 60" X 30"	
1 Stake bench w/sheet storage	42" X 96" X 33"	
1 Tool cabinet	18" X 96" X 84" (open)	
1 Supply storage cabinet	12" X 36" X 87"	

1.4221 Optional equipment

1 Turrent punch press	18" X 20" X 5'	
1 Cornice brake	25" X 68" X 55"	
1 Pitts-burg lock-former	14" X 30" X 36"	

1.423 Metal machining

Item	Approximate size	Utilities
3 13" Metal lathes	24" X 60" X 48"	230 V, 3ph
1 13" Metal lathe	25" X 86" X 48"	230 V, 3ph
1 Vert.-horiz. milling machine	4' X 4' X 6'	230 V, 3ph
1 Surface grinder 6" X 18"	43" X 68" X 63"	230 V, 3ph
1 12" Grinder	13" X 28" X 48"	230 V, 3ph
1 20" Drill press	24" X 37" X 74"	230 V, 3ph
1 Horizontal bandsaw	2' X 5' X 5'	115 V

Item	Approximate size	Utilities
1 Combination forge, heat treat, foundry furnace	2' X 3' X 3'	115 V, gas
1 6" Carbide grinder	15" X 24" X 48"	230 V, 3ph
1 Hardness tester	12" X 22" (bench)	
1 Tool cabinet	18" X 8' X 7' (open)	
Storage area for bar stock	21' Long	

1.4231 Optional or alternate equipment

1 Vertical milling machine	40" X 60" X 72"	230 V, 3ph
1 Horizontal milling machine	40" X 60" X 58"	230 V, 3ph
1 Vertical metal cutting bandsaw w/blade welder	2' X 4' X 7'	230 V, 3ph

1.5 *Auxiliary rooms.*

1.51 Project storage

1.511 Area requirements. A floor space of approximately 250 square feet adjacent to the laboratory.

1.512 Materials to be stored. Floor or shelf space must be allowed to store the following items or equipment:

Approximately 10 engines on portable stands (2' X 4' X 4')

Disassembled engine parts (10 units w/locks), approximately 180 cubic feet w/rigid shelving

10 Small one-cylinder engines (w/locks)

Models of various types of engines (w/locks). Other shelving as possible

1.52 Welding gas storage

1.521 Area requirements. A floor space of approximately 35 square feet adjacent to the oxy-acetylene welding booths.

1.522 Material to be stored. Oxygen and acetylene or other compressed gases used in conjunction with the laboratory. Provision for 4-6 tanks each of oxygen and acetylene to be connected in a manifold supply.

1.523 Special considerations. Special precautions must be taken in regard to fire safety, ventilation, and access. Consideration should be given to locating this near the end wall of the wing so that possible expansion into an adjacent shop can be considered without relocating the compressed gas supply. Should have an outside entrance convenient to service vehicles and also an inside entrance.

1.53 Instructor's office

1.531 Area requirements. A floor space of approximately 200 square feet to be used as an office for power-metal-working instructor and building trades instructor.

1.532 Equipment and furnishings. A 27" wide counter 30" high along one wall to be used as a desk w/knee holes and drawer storage below. This to be located so that windows above counter look into classroom (Item 1.55). A 24" wide base cabinet 36" high along one wall with shelf storage below, wall cabinets above. Provision for Ozalid white-printer. Two closets for personal belongings. Two instructor chairs. Two side chairs. Windows to view laboratory.

1.54 Restrooms

1.541 Area requirements. Approximately 35 square feet should be provided for a women's restroom to include 1 water closet in a stall and 1 sink. Approximately 100 square feet will be required for a men's restroom to include 1 water closet, 2 urinals, and 2 sinks.

1.542 Special consideration. These must be so located that they serve the Power Mechanics Laboratory and the Building Trades Laboratory.

1.55 Classroom

1.551 Area requirements. A floor space of approximately 700 square feet adjacent to the laboratory and office to serve both the power-metalworking laboratory and the building construction laboratory.

1.552 Equipment and furnishings. To be furnished with 20 student desks, 1 table and chair for

instructor, chalk board, tackboard, and 3-4 drafting tables.

1.553 Audio-visual and other teaching aids. The room should be equipped for use of a full line of teaching aids including projectors, CCTV, display models, charts, etc.

1.554 Utilities. Only necessary utility is 115 V electricity with outlets strategically located. Illumination levels should equal those currently recommended for this type of area.

1.555 Environmental considerations. The chief concern will be in the acoustical treatment of the room so that noise from adjacent laboratories does not conflict with the normal use of the classroom.

1.556 Other special considerations.

1.5561 Ceiling height to be 8 feet.

1.5562 Floor to be tile.

1.56 Technical equipment storage.

1.561 Area requirements. A floor space of approximately 100 square feet which can be used to store equipment of a technical nature such as engine analyzers, valve grinders, testing machines, etc. The area should be equipped with an electrical test and instrumentation bench.

1.562 Location. This room should be located convenient to the live work stalls.

1.6 *Audio-visual and other teaching aids.* The area should contain an 8-foot chalkboard and 8 feet of tackboard in a prominent location with map and chart rail. No other specific audio-visual requirements are necessary except as otherwise noted.

1.7 *Utilities.* The following utilities will be necessary, their outlet location in many cases dependent upon the location of specific machines requiring the utility:

1.71 Gas. Natural gas is not available in the Blanding area, so bottled gas will have to be used for this utility.

1.72 Electricity. 115 V single phase, 115 V 3 phase, 230 V single phase, 230 V 3 phase. Overhead electrical should be considered to increase the flexibility of the area.

1.73 Water. A sink of sufficient size (3 taps, oblong sink) with hot and cold water should be provided for student cleanup in the laboratory area. A drinking fountain should be provided in the laboratory--possibly in combination with a sink faucet. Some machines require water, and several hose bibs should be strategically located for floor cleanup and for other uses.

1.74 Compressed air. To be supplied by a compressor in the immediate vicinity of the laboratory.

1.75 Exhaust and ventilation. Special requirements for the mechanical exhaust of smoke fumes and vapors in welding area, and where engines will be running.

1.76 Buzzers. Fire alarm and class bell.

1.77 Clocks. Electric clock in laboratory and in instructors' office.

1.78 Telephone. In instructor's office. Outside line and link to director's office. Bell should ring in laboratory.

1.79 Drainage. Floor drain with grill to extend full length (width) of auto mechanics area. The two-post hoise in Item 1.41 should have a drain in the pit, also a drain in the steam cleaning area.

1.8 *Environmental considerations.*

1.81 Visual. The floors, walls, and ceilings should be of a fire-resistant material which is easily cleanable, has a minimum of glare, and is attractive considering the use to which the laboratory is subjected. Illumination levels should meet those currently recommended for such an area--approximately 100 to 125 foot candles at the working level. The use of windows is discouraged, both from the thermal factor and the maintenance factor.

1.82 Spatial. The arrangement and location of furnishings, equipment, and utilities must permit the greatest possible open area for work. The machines, utilities, and auxiliary rooms must be so situated as to provide for an orderly flow of traffic and materials.

1.83 Acoustical. The design of the laboratory and the finish or treatment of walls and ceiling must be such that echoes, reverberations, and other noise factors are held to a minimum.

1.84 Flexibility. The laboratory should be designed for flexibility in the use of space and consideration must be given to the use of the laboratory at such time that

the program grows and metalworking is moved to a separate laboratory. The future use of the facility may be an expansion into heavier mechanics or possibly an area for body and fender repair.

1.9 *Special considerations.*

1.91 Concrete floors should be well sealed, impervious to oil and water absorption, and easily cleanable. They should be finished to eliminate danger of slipping.

1.92 At least two exits must be provided and these should be on opposite sides of the laboratory.

1.93 Ceiling height will be 14 feet.

1.94 There should be a black-topped area of at least 10,000 square feet to be used for outdoor work and dead storage. This should be immediately adjacent to the laboratory and could serve both the power and building construction laboratories. The area should be fenced so as to be screened from public view and for security reasons. A single post hoist should be located in this area--preferably near the door in Item 1.95, with controls inside the laboratory. If possible, this outdoor work area should *not* have a northern exposure.

1.95 There should be at least 1-16 foot electrically operated overhead door entering from the black-topped area.

1.96 One regular entrance door from the outdoor work area into the laboratory.

1.97 Floor space should be as free of obstructions as possible for efficient cleaning.

1.98 The floor should be marked with yellow lines to designate car stalls and work areas.

1.99 An open area should be provided for work space on the 10 portable engines. The chalkboard mentioned in Item 1.6 should be placed convenient to this area. The mock engines will be stored in the material storage room when not in use (Item 1.51).

1.910 Wall space should be allowed near the cleanup area for a goggle disinfecting cabinet 12" X 30" X 36" and for a coat and book rack.

1.911 Consideration should be given to having machines or equipment which will serve a variety of functions (e.g., drill presses, grinders, benches, etc.) strategically located so they can be efficiently used by students in all work areas.

1.912 Consideration should be given to having students or instructors construct auxiliary facilities (e.g., welding booths), such construction to be of approved design and material.

1.913 Since the ceiling height of auxiliary rooms is less than that of the laboratories (8 feet and 14 feet, respectively), consideration should be given to using the area above the auxiliary rooms for dead storage. For example, lumber could be purchased more cheaply in bulk quantities and stored in this area. Other bulk materials and supplies necessary for the operation of the vocational programs could also be stored.

1.914 The steam cleaning area should be enclosed with a waterproof curtain and should be provided with a drain and cleanout trap. The solvent tank may also be located in this area.

1.915 Machines must be positioned for maximum safety of the operator and other occupants of the laboratory. Hot metal, sparks, etc., are produced by some machines or equipment.

2.0 Building Construction-Industrial Plastics Laboratory.

2.1 *General space description.*

2.11 Number of students. The area should accommodate 20 beginning or 15 advanced students at any one time with an approximate student load of 100 students per day.

2.12 Number of faculty. It is anticipated that one instructor will be in the area at a time; however, two separate teachers may be required on a part-time basis to serve the programs.

2.13 Area requirements. A floor space of approximately 2,400 square feet plus auxiliary rooms for storage will be required. Dimensions approximately 40' X 60' are preferred.

2.2 *Type of activities anticipated.* It is anticipated that the area will house both beginning and advanced courses in building construction (including rough and finish carpentry, plumbing, electrical, and masonry). It is also anticipated that industrial plastics will be offered on a somewhat limited

scale. Instruction in farm building construction and maintenance will also be included.

2.3 *Location and traffic circulation.* This laboratory should be located in a wing with the power-metalworking laboratory. The facility should be located to provide easy access to service vehicles for the delivery of lumber and other building materials as well as the removal of building projects constructed in the laboratory.

The laboratory location should provide easy student access from other areas of the new facility as well as from the existing high school complex.

2.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

2.41 Building construction:

Item	Approximate size	Utilities
1 12" Radial saw	3' X 4' X 5'	230 V
1 5' X 12' Panel saw	18" X 12' X 6'	110 V
1 7" Pedestal grinder	15" X 24" X 48"	110 V, 3ph
2 15" Drill press	18" X 24" X 6'	110 V, 3ph
2 12" Wood lathe	22" X 63" X 48"	230 V, 3ph
1 Belt-disc sander	25" X 30" X 42"	230 V, 3ph
1 18" Surface planer	30" X 36" X 36"	230 V, 3ph
1 12" Table saw	38" X 4' X 3'	230 V, 3ph
1 10" Table saw	38" X 4' X 3'	230 V, 3ph
1 20" Band saw	30" X 42" X 80"	230 V, 3ph
1 8" Jointer	2' X 66" X 3'	230 V, 3ph

	Item	Approximate size	Utilities
1	Sawdust collection system (outside)	3' X 7' X 6'	230 V, 3ph
1	Cement mixer	4' X 6' X 5'	
1	Wheelbarrow		
1	Mortar box		
1	Masonry saw	30" X 42" X 5'	110 V
	Masonry supplies storage		
1	Supplies storage cabinet	1' X 3' X 87"	
2	Tool storage cabinet	18" X 8' X 7' (open)	
1	Utility and glue bench	2' X 5' X 32"	
6	4-Place work benches	54" X 64" X 30	
1	Demonstration table	3' X 6' X 36"	
	Open area for construction	400-500 square feet	

2.411 Optional equipment.

	Item	Approximate size	Utilities
1	6" Stroke sander	36" X 64" X 5'	115 V
1	Spindle shaper	27" X 28" X 3'	230 V, 3ph
1	Spindle sander	2' X 2' X 3'	115 V
1	Scroll saw	15" X 3' X 55"	230 V, 3ph

2.42 Industrial plastics.

	Item	Approximate size	Utilities
1	Platen press	11" X 16" X 36"(bench)	115 V
1	Injection molder	2' X 3' X 5'	115 V
1	Thermoforming machine	2' X 2' X 52"	230 V

Item	Approximate size	Utilities
1 Universal testing machine	18" X 31" X 72"	
1 Work bench for machine	2' X 12' X 30"	
1 Electric range	30" X 30" X 36"	230 V
1 Refrigerator	30" X 30" X 5'	115 V

2.421 Optional equipment.

Item	Approximate size	Utilities
1 Autoclave	??	??
1 Extrusion machine	15" X 45" X 24"	115 V

2.43 Electrical wiring--plumbing.

Item	Approximate size	Utilities
1 Stud model	8' X 12' X 13'	115 V, 230 V

2.5 *Auxiliary rooms.*

2.51 Material storage.

2.511 Area requirements. A floor space of approximately 225 square feet adjacent to the laboratory.

2.512 Materials to be stored. Floor, shelf, or rack space must be allowed to store the following materials: Concrete and masonry materials (for demonstration and practice purposes). Lumber 18 feet long. Sheets of plywood and other panel material. Small pieces of plywood. Short pieces of lumber.

2.513 Special considerations. This area should have an entrance door from the outdoor work-storage area. It should have a roll-up door opening into the laboratory area.

2.52 Project storage.

2.521 Area requirements. A floor space of approximately 200 square feet adjacent to the laboratory.

2.522 Projects to be stored. Floor, shelf, or rack space must be allowed to store the following: Models or mock-ups of houses or sections. Kitchen cabinets under construction. A limited number of furniture projects.

2.523 Special considerations. The wall dividing this room and the laboratory should have a large window or other provision for easy supervision of the area. It should have at least a 3-foot wide entrance door.

2.53 Finish room.

2.531 Area requirements. A floor space of approximately 150 square feet.

2.532 Equipment and furnishings required.

Item	Approximate size	Utilities
1 Spray booth	4' X 6' X 7'	115 V, air
1 Finish material cabinet	1' X 4' X 7'	
Counters and shelving to hold projects while drying		

2.533 Special considerations. Area to be located to provide exhaust from spray booth. Air in the room should be filtered and dust free. Electrical switches and lights should be explosion proof.

2.54 Instructor's office (see Item 1.53).

2.55 Restrooms (see Item 1.54).

2.56 Classroom (see Item 1.55).

2.6 *Audio-visual and other teaching aids.* The area should contain an 8-foot chalkboard and 8 feet of tackboard in a prominent location with map and chart rail. No other specific audio-visual requirements are necessary.

2.7 *Utilities.* The following utilities will be necessary, their outlet location in many cases dependent upon the location of specific machines requiring the utility:

2.71 Electricity. 115 V single phase, 115 V three phase, 230 V single phase, 230 V three phase. Outlets around walls and *overhead* as required.

2.72 Water. A sink of sufficient size with hot and cold water should be provided in the student cleanup area. A drinking fountain should be provided in the laboratory--possibly in combination with a sink faucet. Several hose bibs should be strategically located.

2.73 Compressed air. To be supplied by a compressor in the immediate vicinity of the laboratory. There should be at least two outlets in the laboratory plus finish room.

2.74 Sawdust exhaust. A system will be required for the exhaust of sawdust and shavings from the machines. An overhead exhaust system, while presenting some problems, is more flexible and is recommended. The system should be serviced from the outdoor work area (see Item 2.94).

2.75 Buzzers. Fire alarm and class bell.

2.76 Clocks. Electric clock in laboratory and in instructor's office.

2.77 Telephone. In instructor's office with outside line and link to director's office. Bell should ring in laboratory.

2.8 *Environmental considerations.*

2.81 Visual. The floors, walls, and ceilings should be of a fire-resistant material which is easily cleanable, has a minimum of glare, and is attractive considering the use to which the laboratory is subjected. Illumination levels should meet those currently recommended for such an area--approximately 75 to 100 foot candles at the working level. The use of windows is discouraged both from the thermal factor and the maintenance factor.

2.82 Spatial. The arrangement and location of furnishings, equipment, and utilities must permit the greatest possible open area for work. The machines, utilities, and auxiliary rooms must be situated to provide for an orderly flow of traffic and materials.

2.83 Acoustical. The design of the laboratory and the finish or treatment of walls and ceiling must be such that echoes, reverberations, and other noise factors are held to a minimum.

2.84 Flexibility. The laboratory should be designed for flexibility in the use of space with consideration being given to locating utilities overhead to increase such flexibility.

2.9 *Special considerations.*

2.91 Concrete floors should be well sealed, impervious to liquid absorption, and easily cleanable. They should be finished to prevent danger of slipping.

2.92 At least two exits must be provided and these should be on opposite sides of the laboratory.

2.93 Ceiling height will be 14 feet.

2.94 There should be a black-topped area of at least 10,000 square feet to be used for outdoor work. This is to be immediately adjacent to the laboratory and can also serve as outdoor work area for the power-metalworking laboratory (see Item 1.94). Exit from the area should permit the removal of large objects such as a house. If possible, this work area should not be on the north side of the building.

2.95 There should be one 12-foot overhead door entering from the black-topped area.

2.96 There should be one regular entrance door from the black-topped area into the laboratory.

2.97 Floor space should be as free of obstructions as possible to permit efficient cleaning.

2.98 An open area as large as possible should be available for construction of models and sections, kitchen cabinets, or small buildings indoors during inclement weather (approximately 500 square feet).

2.99 A goggle disinfectant cabinet 12" X 30" X 36" should be placed on a wall near the cleanup area. A coat and book rack should also be provided.

2.910 Machines or furniture which will be useful to all programs in the laboratory (e.g., drill press, grinder, hand tools, benches) should be so located to be used with maximum efficiency to all other areas.

2.911 Machines should be located for maximum safety of operator and other occupants of the laboratory (e.g., kickbacks from table saws).

3.0 Vocational Agriculture Classroom-Laboratory.

3.1 *General space description.*

3.11 Number of students. The area should accommodate 24 students at one time with an approximate load of 150 students per day.

3.12 Number of faculty. The area will accommodate one full-time instructor in vocational agriculture.

3.13 Area requirements. A floor space of approximately 1,200 square feet including auxiliary rooms will be required.

3.2 *Type of activities anticipated.* It is anticipated that the area will house the classes related to the agricultural science aspect of vocational agriculture and club activities of a Future Farmers of America chapter.

3.3 *Location and traffic circulation.* This area should be located in a position which is convenient to other areas of the new facility as well as providing easy access from the existing

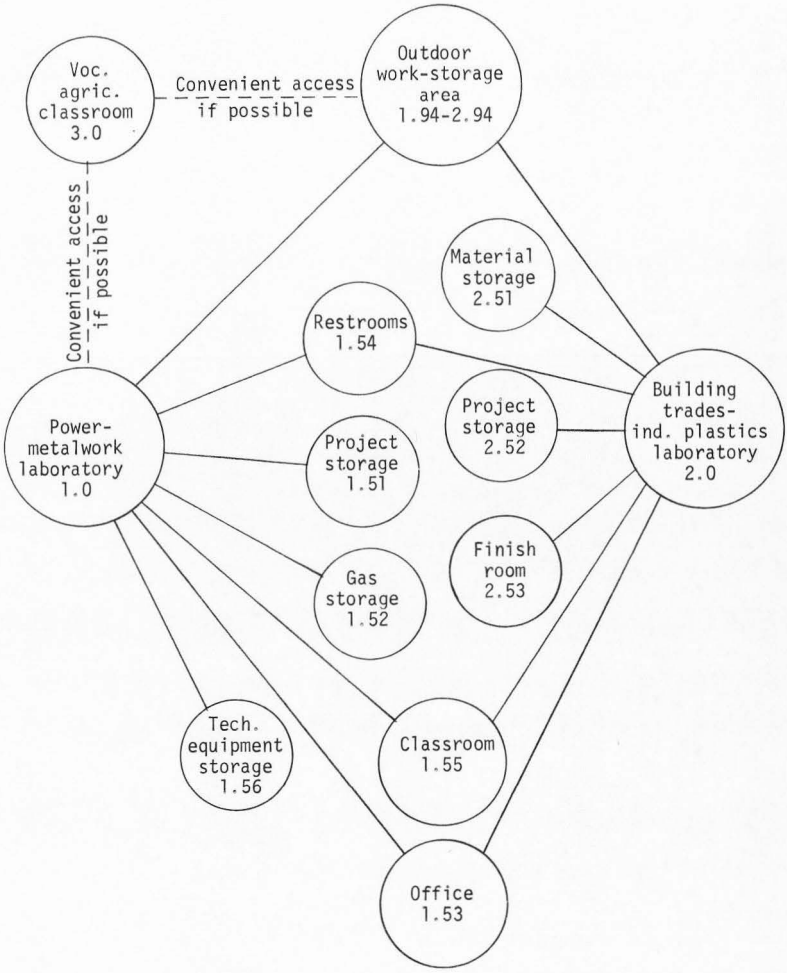


Figure 9. Relationships.

junior high-high school complex. Access to the power-metalworking laboratory and outdoor work-storage areas should be included (Item 1.94).

3.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

3.41 Classroom area (approximately 930 square feet).

Item	Approximate size	Utilities
6 Classroom tables	30" X 8' X 30"	
24 Student chairs		
1 Instructor's table	24" X 48" X 30"	
1 Instructor's chair		
1 Magazine-periodical rack		
Bookshelves--display case--storage	1' X 24' X 7'	115 V
Storage cabinets to include at least 150 pigeonholes 4" wide, 12" high, 10" deep in five sections with locks (30 per section), two 4' X 7' units with adjustable shelving 18" deep, and other storage as appropriate to the space. Doors may be tackboard or sliding chalkboard.		

3.42 Laboratory (approximately 150 square feet).

Item	Approximate size	Utilities
Work counter w/sink and acid-proof top. Base and wall cabinets included (locked).	2' X 15' X 36"	115 V, lighted, gas, water
1 Work table	(as convenient)	

3.421 Special considerations. The wall of the laboratory adjacent to the classroom should have a large window for ease of supervision.

3.43 Office-storage room (approximately 120 square feet).

Item	Approximate size
1 Instructor's desk	30" X 60" X 29"
1 Instructor's chair	
2 Side chairs	
3 4-Drawer filing cabinets	
Shelves and cabinets for storage	

3.431 Special considerations. The wall of the office adjacent to the classroom should have a large window for ease of supervision.

3.5 *Audio-visual and other teaching aids.* The area should be equipped for the use of a full line of audio-visual equipment including projectors, CCTV, charts, pictures, models, etc. It should also contain 16 feet of chalkboard and adequate tackboard.

3.6 *Utilities.* The following utilities will be necessary, their outlet location depending on the location of machines or equipment using the utility.

3.61 Electricity. An ample number of 115 V outlets located strategically around the classroom and at least four duplex outlets in the laboratory area.

3.62 Water. One double sink with hot and cold water to be located in the laboratory counter.

3.63 Clock. To be strategically located in the classroom area and one in the instructor's office.

3.64 Buzzers. Fire alarm and class bell.

3.65 Exhaust. Ventilating fan should be located in the laboratory area.

3.66 Gas. Two outlets over counter area of laboratory or provision for storage and outlet of a small tank of L.P. gas.

3.7 *Environmental considerations.*

3.71 Visual. The floors, walls, and ceilings should be of durable, attractive materials which are easily cleanable and have a minimum of glare. Illumination levels should meet those currently recommended for this type of area.

3.72 Spatial. The classroom area and auxiliary areas must be so situated to provide maximum utility and efficiency.

3.73 Acoustical. No particular provisions are required other than those normally associated with such an area such as acoustical tile on the ceiling.

3.74 Flexibility. Although the use of large tables limits the flexibility, the shape of the room should accommodate a variety of table and chair arrangements. The shape of the area and location of auxiliary rooms should permit an orderly flow of traffic and materials.

3.8 *Special considerations.*

3.81 Ceiling height should be 9 or 10 feet.

3.82 Floor should be tile in the classroom area and laboratory. Carpet should be considered in the office.

4.0 Business Education and Office Practice Laboratory.

4.1 *General space description.*

4.11 Number of students. The area should accommodate approximately 65 students at one time with an approximate load of 250 students per day. The students will be engaged in various activities as described in Items 4.2 and 4.4

4.12 Number of faculty. The facility should provide accommodations for two full-time instructors.

4.13 Area requirements. A floor space of approximately 4,000 square feet including auxiliary rooms will be required.

4.2 *Type of activities anticipated.* It is anticipated that the area will house both beginning and advanced students in typing, shorthand, bookkeeping, office machines operation, and possibly limited instruction in the field of data processing. A program of simulated office practice will also be included, and one of the instructors may serve as coordinator for a program of cooperative education. Club activities of a Future Business Leaders of America club may also be anticipated.

4.3 *Location and traffic circulation.* It is anticipated that ancillary services such as counseling and administration will be located adjacent to this area so the facility should be located in a central position relative to other areas of the building. The location should provide easy student access from other laboratories as well as from the existing junior high-high school complex.

4.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

4.41 Typing area (approximately 1,000 square feet):

Item	Approximate size	Utilities
35 Typing desks	18" X 42" X 30"	115 V, dictaphones
35 Student chairs	18" X 18" X 30"	
1 Instructor's table	2' X 3' X 30"	
1 Instructor's chair	2' X 2' X 3'	

4.42 Bookkeeping-shorthand area (approximately 800 square feet):

Item	Approximate size	Utilities
15 Tables	30" X 60" X 30"	
30 Student chairs	18" X 18" X 30"	
1 Instructor's table	2' X 3' X 30"	
1 Instructor's chair	2' X 2' X 3'	

Storage cabinets to include at least two 4' X 7' units with adjustable shelves 18" deep and other storage as appropriate to the space. Doors may be tackboard or sliding chalkboard.

4.43 Business machines area (approximately 400 square feet):

This area might consist of a counter along one or more walls. It should accommodate 20 business machines of various types and should provide seating for 20 students. If such a counter is used, provision should be made to allow the machine cords to drop behind the counter to electrical outlets below. Units for storage under the counter would also be desirable.

4.44 Simulated office area (approximately 600 square feet):

Item	Approximate size	Utilities
6 Desks (w/18" X 24" return)	30" X 60" X 29"	cc Telephone, 115 V
6 Clerical desks	30" X 60" X 29"	cc Telephone, 115 V
12 Swivel chairs	18" X 18" X 30"	
4 2-Drawer filing cabinets	15" X 27" X 26"	
1 Dictating unit (on portable stand)	15" X 24" X 30"	
1 Transcribing unit (on portable stand)	15" X 24" X 30"	

4.441 Special considerations. Each desk should be equipped with a telephone outlet on the left side and an outlet for the operation of a typewriter or other business machines. The telephones are to be installed in a closed circuit loop. Depending on the design of the complex and the location of the director's office, one of the secretaries in the simulated office area may serve as receptionist for the director. In this case, the simulated office area must be located near the main entrance, near the director's office, and one telephone must have an outside link and also be connected to the telephone of the director and counselor. The area may be separated from the other activity areas by means of a decorative pipe and rope fence or similar divider.

4.45 Special considerations. The variety of concurrent activities in the area may cause undue distraction among the students. For this reason, consideration should be given to separating the area into two spaces with a folding door. Such a separation should divide the typing and simulated office areas from the shorthand and office machines areas. However, the shorthand students should have convenient access to the typing area.

4.5 *Auxiliary rooms.*

4.51 Classroom-lecture area.

4.511 Number of students. Provision should be made to accommodate 50 students.

4.512 Area requirements. It is anticipated that approximately 900 square feet of space will be required.

4.513 Special considerations. The area is a part of the business occupations complex, but provision should be made to isolate the area by means of a folding door. Provision should also be made to further subdivide the area into two separate classrooms which will house 20 and 30 students, respectively (approximately 400 and 500 square foot areas). Provision should also be made for the use of all types of audio-visual aids such as projectors, CCTV, charts, graphs, chalkboards, etc.

4.52 Office

4.521 Area requirements. Approximately 150 square feet will be required.

4.522 Type of activities anticipated. This area will serve as an office for two business education instructors.

4.523 Major equipment to be housed in the area.

Item	Approximate size
2 Double pedestal desks	30" X 60" X 29"
2 4-Drawer files	15" X 27" X 52"
2 Closets for personal belongings	
2 Side chairs	

4.524 Special considerations. This area should be located so that activities in both the classroom area and in the laboratory area can be easily viewed. Large windows should be provided to view such activities.

4.53 Workroom.

4.531 Area requirements. Approximately 150 square feet will be required.

4.532 Type of activities anticipated. This area will serve as a duplicating room for the business education department, as a workroom for all faculty members of the building, and as a storeroom for audio-visual equipment.

4.533 Major equipment to be housed in the area.

Item	Approximate size	Utilities
1 Table for two typewriters	30" X 60" X 29"	115 V, near
Counter space for spirit and multilith duplicators, thermofax, and other copy machines		
Base and wall cabinets for supplies and audio-visual equipment storage		

4.534 Special considerations. A sink with hot and cold water should be provided in the counter space. Provision should also be made for the storage of large sheets of poster paper and tagboard (2' X 3'). The area should be located near the main entrance and the administrative offices to permit convenient access to faculty members. However, the area will receive limited use by business education students, so its location should provide for supervision of such students by the business education instructors.

4.6 *Storage.* Provision must be made in each of the instructional areas for adequate wall cabinet storage to accommodate the materials and supplies used in the area.

4.7 *Audio-visual and other teaching aids.* No particular provisions are required except chalkboard, copious amounts of tackboard, and projection screens in the typing and shorthand areas. Tackboard and sliding chalkboard should be considered as doors for storage cabinets.

4.8 *Utilities.* The following utilities will be required, their outlet locations depending upon the location of machines or equipment using the utility.

4.81 Water. A sink with hot and cold water should be provided in the workroom. A drinking fountain should also be provided.

4.82 Electrical. A very large number of 115 V electrical outlets will be required in the typing, bookkeeping, office machines, and simulated office areas. Consideration should be given to the problem of dirt entering outlets which are flush with the floor. Illumination of the area should meet those levels currently established for such an area.

4.83 Clocks. At least one clock should be prominently located in the laboratory area or in each subdivision of the laboratory area, one in the office, and one in the workroom.

4.84 Telephones. A closed circuit telephone system should be installed in the simulated office area. One of these telephones may also have an outside link (see Item 4.441).

4.85 Buzzers. Fire alarm and class bell.

4.86 Dictaphone. To be provided by a Norelco wireless system.

4.9 *Environmental considerations.*

4.91 Visual. The floors, walls, and ceilings should be of attractive, durable, easily cleanable materials which are glare free and provide a business-like atmosphere.

4.92 Spatial. This is a large space, but because of the variety of concurrent activities the area must be well planned so that each activity area is somewhat isolated. This may be accomplished by the direction of seating.

4.93 Acoustical. Because of the large number of students occupying the space and the inevitable noise from typewriters and other office machines, the floors, walls, and ceilings must be finished with materials which have high muffling qualities. Baffles may also be required. The floor should be carpeted and carpet on the ceiling may also be considered.

4.94 Flexibility. Although the location of utility outlets will limit the flexibility, original planning should provide for the greatest possible flexibility in the use of the space.

4.10 *Special considerations.*

4.101 At least two exits should be provided--these to be located on opposite sides of the room.

4.102 Ceiling height is to be 9 or 10 feet.

4.103 A coat and bookrack should be provided near the entrance for student and visitor use.

5.0 Home Economics-Health Occupations Laboratory.

5.1 *General space description.*

5.11 Number of students. The area should accommodate 24 students at a time with a total load of approximately 120 students per day. Future growth may require that

35-40 students would be in the area at one time with approximately 200 students per day.

5.12 Number of faculty. In the immediate future one instructor is anticipated; however, growth or program variations may dictate the addition of another part-time or even full-time instructor in home economics. One part-time instructor in health occupations will also be required.

5.13 Area requirements. A floor space of approximately 4,000 square feet will be required. Ratio of length to width should be approximately 1:1½ (53' X 75').

5.2 *Type of activities anticipated.* It is anticipated that the facility will house basic and advanced classes in foods and nutrition, clothing-textiles, and child care and family living. Short-term specialty courses specifically related to summer employment may also be offered. Further, the area will house the classroom activities of a program which provides an orientation to health occupations with specific training for nurse's aides. The health occupations course will be limited to one or perhaps two periods per day.

5.3 *Location and traffic circulation.* The laboratory should be located so that student access is convenient from the existing high school and from other areas of the new facility. Consideration should be given to the possible inclusion of an outdoor patio-play area for use in outdoor cookery and in units in child care. The outdoor area should be somewhat secluded from a view of streets or other sources of distraction.

5.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

5.41 Foods and nutrition. Six complete kitchen units. The units are to be designed to represent a variety of kitchen types such as one wall, "L" shaped, "U" shaped, and island. The kitchen units are to include:

Item

1 Double sink (garbage disposals in two units).

1 Range (electric or gas). Consideration might be given to having one or two of the kitchen units with counter-top range and built-in oven.

Sufficient counter space for four students to work conveniently.

All of the units should have a laminated maple chopping block built into the counter.

Exhaust to clear the area of fumes, odors, and smoke.

1 Complete commercial foods unit including grill, deep fryer, and heavy duty mixer, such as might be used in preparing students for employment in cafes, restaurants, and drive-ins. Exhaust hoods to cover grill and fryer. A chopping block should also be included in the counter top.

6 Dining tables (seats four, expandable to seat six) so arranged as to be used for dining at each of the kitchen units and also to be used as a lecture area.

24 Chairs

1 Teacher demonstration table (2' X 6' X 3'), possibly on rollers, which includes a counter-top range, drawers and doors for storage, and an overhead mirror which can be adjusted to various angles. If this unit is portable, 220 V outlets must be strategically located in at least three places in the laboratory. If the unit is stationary, its location must be of maximum utility and convenience.

1 Portable dishwasher.

Item

2 Refrigerators located so that each will conveniently serve three of the kitchen units.

1 Deep freeze (upright) located to conveniently serve all kitchen units.

1 Formal dining table. The type which expands from seating two to seating eight is preferred. This may be located in the family living area (Item 5.43).

3 Portable service carts, one of which has laminated maple top with rack storage for trays below.

1 Step stool.

1 Automatic clothes washer.

1 Automatic clothes dryer, vented outside.

1 Deep sink in laundry area.

Sufficient storage cabinets for illustrative materials and for the preparation, cooking, serving utensils, and large utensils used in quantity cooking.

Storage cabinets also for cleaning equipment and soiled laundry. There should also be a pantry or other area for storage of food supplies. Sliding chalkboard should be considered as doors for some cabinets.

5.42 Clothing and textiles.

Item

12 Cabinet model sewing machines. These are to be located in continuous counter or in multi-machine island units. If counter is used, the width should be such that it can be used as a cutting table for small pieces (2'-6" to 3'). The machines should be situated so that the fabric is to the left of the machine while in use. The under-counter space between sewing machines should be utilized for tote tray storage.

6 Portable sewing machines with sufficient cabinet space for storage when they are not in use.

12 Chairs at sewing machines.

2 Cutting tables (48" X 72" X 36") which have corkboard tops.

Item

8 Tables (trapezoidal 30" X 30" X 60") to be situated in a discussion area. These will also be used for the portable sewing machines; therefore, storage cabinets for the machines must be convenient to this area and electrical outlets must be convenient. This may also be used as a discussion area for the family living area.

24 Stackable chairs in the discussion area.

Storage cabinets to include:

Provision for patterns, pattern catalogs.

Storage for three ironing boards.

Storage for six table-top ironing boards.

At least three wardrobe units (2' X 4' X 7')

Tote tray units as allowable.

Dressing area including three-way mirror which may fold in to conceal storage space behind. The area should be enclosed with a curtain or other divider.

A grooming area to include a sink, dressing table, mirror(s), and chair.

5.43 Child care, family living, health occupations:

Item

1 Living room unit including sofa, two chairs, two end tables, coffee table, and book case with space to allow a variety of furniture arrangements.

Equipment for child care such as low tables, small stacking chairs, toys, books, and other play materials to accommodate groups of 6 to 10 children. There must also be storage space for this equipment when not in use. This area to be located convenient to the outdoor play area in Item 5.3.

If restrooms serving other areas of the center are not convenient to this area, restrooms should be planned to serve the children and other occupants of the laboratory.

Health occupations will need the following items of equipment:

Item

1 Hospital bed

1 Overbed table

1 Somino unit

1 Sink. If the sink in the grooming center is convenient to this area, it can serve this purpose.

Provision should be made to enclose this equipment with a folding door or curtain when not in use.

The tables and chairs used for discussion in clothing and textiles should be convenient for use in this area.

5.44 Special considerations. The entire area is to be planned to reflect an atmosphere of comfort and home-like environment. It should represent what families in the communities may reasonably hope to have and yet provide motivation for the students to improve their homes.

5.5 *Other furnishings.* Provision should be made for a space for a teacher office--either as a separate room or as an isolated space in the laboratory. The space should include a double pedestal desk, a swivel chair, two four-drawer filing cabinets, and a locked closet for personal belongings. If a separate office is provided, large windows should be provided for laboratory supervision.

5.6 *Audio-visual and other teaching aids.* The laboratory should be equipped to utilize a full line of teaching aids such as projectors, CCTV, charts, models, etc., although larger groups engaged in various activities may restrict the darkening of the room for movies, slides, etc. It is anticipated that

other rooms in the building could be used in such cases. There should be provision for portable, convertible chalkboard-tackboard. There must be provision for storing textbooks, periodicals, and other instructional materials. Sliding chalkboard and tackboard doors should be considered as covers for storage cabinets in all areas.

5.7 *Utilities.* The following utilities will be necessary, their outlet location being dependent upon the location of equipment or machine using the utility:

5.71 Water. Hot and cold water in the kitchen sinks, for the clothes washer, for the portable dishwasher, for the sink in the grooming area, and for the restrooms. A drinking fountain should also be provided, possibly in connection with one or more of the various sinks, rather than a separate fountain.

5.72 Gas. Depending on the type of ovens, ranges, refrigerators, and dryer used, gas outlets may be required.

5.73 Electricity. 115 V and 230 V outlets to be located for most convenient and efficient use. Outlets with indicator light and switch for use with electric irons. At least three duplex outlets in each kitchen unit. Floor outlets in each area as appropriate to permit flexibility.

5.74 Exhaust. Exhaust should be provided for commercial foods unit and other provision to exhaust kitchen fumes or smoke.

5.75 Buzzers. Fire alarm and class bell.

5.76 Clocks. One electric clock strategically located. If teacher's office is separated, it should be provided with a clock (see Item 5.5).

5.8 *Environmental considerations.*

5.81 Visual. The floors, walls, and ceilings should be of attractive, durable, easily cleanable materials which are glare free. Colors should be harmonious and pleasant.

5.82 Spatial. The arrangement of furnishings and equipment must allow the greatest possible open area for multipurpose activities while not inconveniently crowding fixed equipment. The location of fixed equipment should provide for an orderly flow of traffic and materials.

5.83 Acoustical. Since a variety of activities may be going on at once, provision must be made for adequate sound muffling. This may consist of baffles on the ceiling. Other provisions might include a carpeted ceiling and sound absorbing materials on the walls where possible. The entire floor should be carpeted.

5.84 Flexibility. Although the kitchen units and related equipment and the sewing cabinets restrict the flexibility of the area, other areas and their furnishings should be planned for the greatest flexibility possible. For example, the family living area should be planned to accommodate a wide variety of furniture arrangements and other multipurpose activities which may be planned to utilize the space.

5.9 *Special considerations.*

5.91 Ceiling height to be 9 or 10 feet.

5.92 Provision should be made for storage of large punch bowls, large serving platters, and other large cooking utensils.

5.93 Provision should be made for storage of materials or student work near the area of use.

5.94 A coat rack and book rack for student and visitor use should be provided near the main entrance to the laboratory.

6.0 Administrative-Reception Area

6.1 *General space description.*

6.11 Number of persons. The area should provide for a receptionist, a director of the center, and an occupational guidance counselor.

6.12 Area requirements. The following areas will be required:
Reception area--approximately 175 square feet.
Director's office--approximately 150 square feet.
Counselor's office--approximately 200 square feet (to include an area for small group counseling or orientation and a small testing room).

6.2 *Location and traffic circulation.* The area should be conspicuously located in a central area of the facility near the main entrance. It should be convenient to students, faculty, and the general public. It should also be adjacent to the business education complex.

6.3 *Major equipment.*

6.31 Director's office.

Item	Approximate size
1 Double pedestal desk	36" X 72" X 29"
1 Swivel arm chair	24" X 24" X 36"
2 Four-drawer files	15" X 27" X 52"
1 Closet for personal belongings	

6.32 Reception area:

Item	Approximate size
1 Double pedestal desk	30" X 60" X 29"
1 Swivel chair	18" X 18" X 30"
1 Four-drawer file	15" X 27" X 52"
1 Coat and hat rack	
Several comfortable chairs or a couch for persons waiting to see the counselor or the director	

6.33 Guidance counselor's office.

Item	Approximate size
1 Double pedestal desk	30" X 60" X 29"
1 Swivel arm chair	24" X 24" X 36"
1 Conference table	3' X 8' X 30"
10 Side chairs	
2 Four-drawer file cabinets	
1 Closet for personal belongings	

6.331 Test room (approximately 25 square feet).

Item	Approximate size
1 Table	2' X 3'
1 Chair	

6.4 *Audio-visual and other teaching aids.* No particular requirements for audio-visual aids except if the counselor's office includes a small conference area, in which case provision should be made for the use of projectors, charts, pictures, chalkboard, and small occupational library.

6.5 *Utilities.* The following utilities will be required, their outlet location being dependent on the location of furnishings or equipment requiring the utility.

6.51 Electricity. Required for typewriters and other business machines as well as an ample supply of outlets for cleaning and other conveniences.

6.52 Clock. Each of the three areas to be equipped with an electric wall clock in a prominent location.

6.53 Telephone. Each of the three areas to be equipped with a telephone. The three telephones should be linked together, should have an outside link, and should be linked to the telephone in the power-construction offices (see Item 1.78).

6.54 Buzzers. Fire alarm and class bell. These are not necessary within this area if such buzzers are easily heard from adjacent areas through closed doors.

6.55 Water. A drinking fountain should be located near the reception-entry area.

6.6 *Environmental considerations.*

6.61 Spatial. The arrangement and location of furnishings must permit the greatest possible open area for the convenience of guests, students, and faculty. The main

entry must be so designed to permit the rapid entry-exit of students.

6.62 Visual. The floors, walls, and ceilings should be furnished with durable, easily cleanable materials which are attractive and exude an atmosphere of warmth and friendliness although business-like.

6.63 Acoustical. Surface finishes should produce an area which is as quiet as possible. Floors should be carpeted and the ceiling should be carpeted or have good quality acoustical tile.

6.64 Flexibility. Although the size of the areas does not permit much flexibility, consideration should be given to room shape and utility outlets which permit two or three different furniture arrangements.

6.7 *Special considerations.*

6.71 Ceiling height should be 8 or 9 feet.

Special note: The following facilities for Drafting (7.0), Indian Arts and Crafts (8.0), and Distributive-Cooperative Education (9.0) will not be included in initial construction. Tentative educational specifications for these programs are hereby included, however, to acquaint the architect with program requirements so that his planning may anticipate future expansion into these programs.

7.0 Drafting Laboratory.

7.1 *General space description.*

7.11 Number of students. The area should accommodate 20 students at any one time with an approximate load of 100 students per day.

7.12 Number of faculty. It is anticipated that in the immediate future only one teacher will use the area. However, with the possible future addition of a program of commercial art, two instructors may use the area, although at different times.

7.13 Area requirements. A floor space of approximately 2,000 square feet including auxiliary rooms will be required.

7.2 *Type of activities anticipated.* In the immediate future, the area will house both beginning and advanced classes in technical and architectural drafting. It is not anticipated that drafting will be a full-time program; therefore, other use of the facility may be as a classroom for some other program. In the future, with the possible addition of a commercial art program, the facility would be used full time for drafting and commercial art.

7.3 *Location and traffic circulation.* This laboratory should be located as close as possible to the crafts area because of the possible future expansion into commercial art which would be related to the arts and crafts aspect. The location should also provide ready access to other areas of the new building as well as easy access from the existing school plant.

7.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

7.41 Drafting.

Item	Approximate size	Utilities
16 Drafting tables w/V-track drafters	37" X 48" X 37"	
2 Drafting tables w/4 drafting machines	42" X 84" X 37"	
1 Instructor's table	3' X 5' X 37"	
1 Tracing table	30" X 40" X 37"	115 V
20 Student chairs	18" X 18" X 30"	
1 Instructor's chair	18" X 18" X 30"	
1 Paper cutter	30" X 30" (counter)	
3 Storage cabinets	22" X 4' X 7'	
1 4-Drawer file	15" X 27" X 52"	
Counter space	2' X 20' X 36"	Water, 115 V

7.42 Other furnishings.

Item
Book rack for reference books and periodicals.
Coat hangers.
Copious amounts of tackboard on walls.

7.5 *Auxiliary rooms.*

7.51 Storage room.

7.511 Area requirements. Approximately 80 square feet.

7.512 Type of activities anticipated. This room will be used for storage and possibly for a few items of graphic arts equipment already owned by the district. The future use may be as a darkroom in connection with graphic or commercial art.

7.52 Duplicating-technical illustrating room.

7.521 Area requirements. Approximately 80 square feet.

7.522 Type of activities anticipated. The room will be used for duplicating equipment and for air brushing associated with technical illustration.

7.523 Major equipment and/or furnishings. Work counter, whiteprinter (countertop model), air brush cabinet, duplicating paper storage.

7.524 Utilities required. Air, 110 V, exhaust.

7.6 *Audio-visual and other teaching aids.* This laboratory must be equipped to accommodate a full line of teaching aids including projection machines, CCTV, display and storage of drafting models, etc. The chalkboard should be equipped with a track drafter.

7.7 *Utilities.* The following utilities will be required, their outlet in some cases being dependent upon the placement of specific machines or furnishings.

7.71 Electricity. 115 V single phase. Sufficient outlets around the walls.

7.72 Water. A sink with hot and cold water should be included in the counter space in Item 7.41. A sink may also be included in the duplicating room (Item 7.52). A drinking fountain should be included.

7.73 Compressed air. For airbrushing equipment. May be provided by special diaphragm compressor or from main air supply--water trap required.

7.74 Exhaust. Exhaust of fumes from airbrushing required, possibly also from duplicating equipment.

7.75 Buzzers. Fire alarm and class bell.

7.76 Clocks. Electric clock in laboratory.

7.8 *Environmental considerations.*

7.81 Visual. The floors, walls, and ceilings should be finished in attractive materials which are glare free. Illumination should meet levels currently established for this type of area--150 to 200 foot candles.

7.82 Spatial. The arrangement and location of furnishings as well as the shape of the room must allow for the greatest possible utilization of space.

7.83 Acoustical. The design of the laboratory and the finish or treatment of walls, ceiling, and floor should be such that echoes, reverberations, and other noises are kept to a minimum. The floor should be carpeted and the ceiling should have some type of acoustical treatment.

7.84 Flexibility. Although the size of the laboratory and the number of furnishings limit the flexibility, the space should be planned to permit as much flexibility as possible.

7.9 *Special considerations.*

7.91 Ceiling height should be 10 feet.

7.92 Wall cabinets and counters (Item 7.41) should include base cabinet shelf space with locking doors and two sections of shallow locking drawers (approximately 4') for the storage of large sheets of paper (24" X 36").

8.0 Indian Arts and Crafts Laboratory.

8.1 *General space description.*

8.11 Number of students. It is anticipated that the area will accommodate approximately 25 students at one time with an approximate load of 150 students per day.

8.12 Number of faculty. In the immediate future, only one instructor will be involved. However, the program may expand to a two-teacher area with the possibility of one instructor teaching commercial art part-time in the drafting laboratory.

8.13 Area requirements. Approximately 2,500 square feet of floor space including auxiliary rooms will be required.

8.2 *Type of activities anticipated.* It is expected that the area will house both beginning and advanced classes related to Indian arts and crafts. The crafts to be included are: pottery and ceramics, lapidary and silversmithing, basket weaving, rug weaving, and leather work.

8.3 *Location and traffic circulation.* This laboratory should be located in a central portion of the building near the main entrance. Since this program will be one of the unique aspects of the center, geared especially toward the Indian population, this area should be in a prominent location readily viewed by visitors. It should be adjacent to the drafting laboratory to encourage the use of precision instruments for designing and also to facilitate the possible future inclusion of a commercial art program. The laboratory location should provide

easy student access from other areas of the new building as well as from the existing high school complex.

8.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

8.41 Pottery-ceramics.

Item	Approximate size	Utilities
13 Potter's wheels	2' X 3' X 3'	115 V on 4
1 Pug mill	2' X 5' X 4'	115 V, water access

Storage cabinets for clay and pottery articles in various stages of production and finishing. Adjustable shelving to be 15" deep.

8.411 Auxiliary areas.

8.4111 Humidifier room. This room should be approximately 60 square feet and should contain shelves of expanded metal and a ceiling-mounted humidifier. The purpose of the room is to prevent the too-rapid drying of green pottery.

8.4112 Glazing area. This area should be approximately 100 square feet and should be equipped with counter-top working area with cabinet storage below. The counter top should contain two sinks and provision for two small spray booths for glazing.

8.4113 Kiln room. This room should be approximately 120 square feet and should be

designed to house one 3' X 3' electric kiln and one 5' X 5' gas kiln plus work counter and base and wall cabinet storage of supplies and projects.

8.4114 Special considerations. The floor in the laboratory area (Item 8.41) should be ceramic tile and the wall should have a 4-foot high wainscot of ceramic tile. The floor in each of the areas should be equipped with floor drains to permit hosing the floor; sand traps as necessary. There should be three sinks in the laboratory counter-top area adjacent to the potter's wheels. Exhaust from kilns is required. One of the potter's wheels should be located for demonstration purposes where it can be easily viewed from the other 12 wheels (e.g., at the head of two rows of six wheels).

8.42 Lapidary-silversmithing.

	Item	Approximate size	Utilities
1	Slab saw	2' X 3' X 4'	115 V
2	Trim saw-grinder-polisher unit	18" X 3' X 4'	115 V, water
1	Horizontal lapping	2' X 2' X 3'	115 V, water
1	Tumbling machine		
1	Bench furnace		Gas

Item	Approximate size	Utilities
3 Soldering torches		Acetylene or LP gas
1 Tool cabinet		
Work bench w/ fireproof top		
1 Enameling kiln (bench mount)		115 V
1 Sink (for mixing plaster) or convenient access to ceramics sinks		

8.421 Special considerations. The floor in this area should be ceramic tile with a 4-foot ceramic tile wainscot also on the wall. Exhaust is required over kiln, furnace, and torch area.

8.43 Rugweaving.

Item	Approximate size
6 Floor looms (vertical)	32" X 43" X 69"
Storage for materials	
Storage for 12 table-top looms	

8.44 Basketweaving.

Item
Storage of materials

8.45 Leatherwork.

Item	Approximate size
4 Work tables (w/lockers)	54" X 64" X 29"
4 Work tables (w/lockers)	54" X 64" X 33"
Tool cabinet	
Materials storage cabinet	

Item	
Note: Work tables are to be used in leatherwork, rug-weaving, and basket weaving.	
24 Stackable chairs	

8.5 *Auxiliary rooms.*

8.51 Store room. An area of approximately 100 square feet will be necessary. Adjustable shelving should be provided for the storage of various types of crafts materials. Extra precautions must be taken for the storage of silver and other valuable items.

8.52 Instructor's office. An area of approximately 75 square feet will be necessary. Furnishings will include:

Item	Approximate size
1 Double pedestal desk	30" X 60" X 29"
1 4-Drawer file	15" X 27" X 52"
1 Closet for personal belongings	
1 Instructor's chair	
1 Side chair	
1 Wall or floor bookrack	

8.521 Special considerations. The office should be provided with a large window which offers a commanding view of the entire laboratory.

8.6 *Audio-visual and other teaching aids.* The area should be equipped to accommodate a full line of audio-visual aids including projectors, CCTV, models, charts, pictures, and displays of students' work. The walls not otherwise occupied by equipment, furnishings, or storage should be equipped with tackboard

and/or a hook rail for display. Large amounts of locked, glass-enclosed, adjustable shelving for display should be provided.

8.7 *Utilities.* The following utilities will be required, their outlet location depending upon the location of machines or furnishings requiring the utility:

8.71 Electricity. 115 V and 230 V. Ample duplex outlets should be provided in each area.

8.72 Gas. Liquified petroleum will be required for a kiln, bench furnace, and possibly for torches.

8.73 Water. A sink of sufficient size with hot and cold water should be provided in a student cleanup area. This may be the sinks previously mentioned in Item 8.412 if their location is convenient. Two sinks are also required in the glazing area (Item 8.4112) and possibly one in the silversmith area (Item 8.42).

8.74 Exhaust. Provision should be made for exhaust of smoke and vapors from the silversmith area and for exhaust from kilns. Exhaust from glazing spray booths is also required.

8.75 Buzzers. Fire alarm and class bell.

8.76 Clocks. Electric clock in prominent location in laboratory and in instructor's office.

8.77 Drainage. Floor drain in ceramics laboratory area, in glazing area, in kiln area, and in humidifier room. Sand traps as required.

8.8 *Environmental considerations.*

8.81 Visual. The floors, walls, and ceiling should be of materials which are easily cleanable, durable, and attractive. Illumination levels should meet those currently recommended for such an area.

8.82 Spatial. The arrangement of furnishings and equipment must permit the greatest possible area for work as well as an orderly flow of traffic and materials.

8.83 Acoustical. The design of the laboratory and the finish or treatment of walls, floor, and ceiling must be such that echoes, reverberations, and other noise factors are held to a minimum. The noise from weaving looms and hammering at the work benches is of special concern.

8.84 Flexibility. The laboratory should be designed for flexibility in the use of space, as other crafts programs may be incorporated or original ones expanded or deleted.

8.9 *Special considerations.*

8.91 Floor in ceramics and silversmith area should be ceramic tile. Floor in weaving and workbench area should be vinyl or asphalt tile.

8.92 Ceiling height should be 9 or 10 feet.

8.93 Floor space should be as free of obstruction as possible to permit efficient cleaning.

8.94 Particular consideration should be given to large amounts of storage for material and student projects; also for display of work samples and student projects.

8.95 An area should be provided where aprons and coveralls can be hung while drying. Provision for 25-30 hangers.

8.96 There should be convenient access to a rest room and change area.

9.0 Distributive-Cooperative Education Laboratory.

9.1 *General space description.*

9.11 Number of students. The area should accommodate 20 students at one time with an approximate daily load of 80 students.

9.12 Number of faculty. There will be one full-time instructor involved in teaching distributive education. He will also serve as the coordinator of a diversified occupations cooperative program. During the time spent on coordinating activities, the area may be used as a classroom by other instructors.

9.13 Area requirements. A floor space of approximately 1,500 square feet including auxiliary areas will be required.

9.2 *Type of activities anticipated.* It is anticipated that the area will house both beginning and advanced courses in distributive education. Such instruction will include stocking shelves, merchandise display, cashier/checker skills, and business management skills associated with ownership and maintenance of a business. Part of the training will include an integral school store which will be operated by students in this department.

9.3 *Location and traffic circulation.* This laboratory should be adjacent to the arts and crafts and drafting laboratories. The reasons for this include:

9.31 Many of the products sold in the integral school store will be associated with these two programs.

9.32 The interrelationship of the crafts-commercial art function and graphics machines and equipment used for display and advertising between a graphics department and distributive education department necessitates adjacent locations to avoid duplication of equipment.

9.33 Because of the school store aspect, this laboratory should provide easy student access from other areas of the building as well as from the existing high school complex. Because of courses in business management which may be interrelated with business education, convenient access to the business education complex should be considered.

9.4 *Major equipment to be housed in the area.* Floor or wall space must be allowed for the following equipment and/or furnishings:

9.41 Classroom area.

Item	Approximate size	Utilities
10 Rectangular tables	2' X 4' X 30"	
20 Student chairs		
1 Instructor's desk	30" X 60" X 29"	
1 Instructor's chair		
2 4-Drawer filing cabinets	15" X 27" X 52"	

Item	Approximate size	Utilities
1 Magazine-periodical rack	2' X 4' X 4'	
1 Glass-front display booth	4' X 6' X 7'	115 V
Work counter w/sink	2' X 16' X 36"	115 V, water
Storage for two mannequins and other equipment and materials for display and merchandising		

9.42 School store area.

Item	Approximate size	Utilities
3 Wall display case	18" X 4' X 7'	115 V
3 Floor display case	18" X 4' X 3'	115 V
3 Wall display shelf unit	2' X 4' X 7'	
1 Shadow box unit	18" X 4' X 7'	
1 Wrapping counter/ register stand	2' X 4' X 3'	115 V
1 Display booth (glass facing corridor or other heavy use area)	4' X 10' X 8'	115 V
Storage room	100 square feet	

9.43 Special considerations. The classroom and store should be separate but should have a large connecting door permitting the free flow of traffic when necessary in setting up displays or for other activities requiring joint use. Storage facilities should include space for six mannequins (four adult, two child) and seasonal display materials as well as the supplies associated with the school store.

9.5 *Audio-visual and other teaching aids.* The classroom area should be equipped for the use of a full line of instructional aids including projectors, CCTV, models, charts, and pictures. Copious amounts of tackboard on the walls are required. There are no specific requirements for audio-visual aids in the school store area except that some display cases are lighted.

9.6 *Utilities.* The following utilities will be required, their outlet location being dependent on the location of equipment or furnishings using the utility:

9.61 Electricity. 115 V for lighting, display, and outlets for general use and maintenance.

9.62 Water. A sink and drinking fountain will be required in the classroom area.

9.63 Buzzers. Fire alarm and class bell.

9.64 Clocks. Electric clock in classroom and in school store.

9.7 *Environmental considerations.*

9.71 Visual. The floors, walls, and ceilings should be of materials which are attractive, durable, and easily cleanable. The finishes and furnishings should provide a business-like atmosphere. Illumination levels should meet those currently recommended for this type of area.

9.72 Spatial. The arrangement of equipment and furnishings should permit the greatest possible open area for work. The location of furnishings in the school store should permit an orderly flow of traffic and materials.

9.73 Acoustical. No particular requirements other than those normally associated with this type of area except acoustical treatment to reflect a business-like atmosphere.

9.74 Flexibility. The size and shape of the classroom and the location of utilities should permit various furniture arrangements. The size and shape of the store and the location of utilities should permit a variety of arrangements of the display units, checkout counter, and traffic patterns.

9.8 *Special considerations.*

9.81 Ceiling height to be 9 or 10 feet.

9.82 Floors should be carpeted

9.83 There should be convenient access of service vehicles to the storeroom.

9.84 A coat and bookrack should be provided for student use convenient to the entry.

10.0 Mobile Units.

10.1 *The overall concept.* The overall concept is that the mobile units will serve as shells to house whatever program is needed in a remote location. Equipment and furnishings will be removed from the vocational center if possible to run the programs in the mobile units. In some cases, additional equipment will be required.

10.2 *General description.*

10.21 Size. The mobile units will be 48 feet long plus hitch, 11 feet 10 inches wide, and will have a 7-foot ceiling height.

10.22 Equipment. The units must be equipped to be completely self-contained if necessary including electricity, heat, water, and waste, and should also be equipped to connect to existing utilities if possible. Equipment required for the operation of the specific programs is described later.

10.221 Electricity. A 10 KW generator with 115/230 capabilities to be installed on the front of the unit. Fuel capacity should be sufficient for 24 hours of continuous operation. Generator should be enclosed for security reasons.

10.222 Heat. An LP gas forced-air furnace with outside access to be installed at front of mobile unit. Ductwork to distribute heat as appropriate. LP gas tank of sufficient size with outside access will be required.

10.223 Water. A 300-gallon water tank to be installed at front of mobile unit at height sufficient for gravity pressure to sinks and toilet. LP gas-fired water heater to be included also. Outside access to water tank and water heater is necessary.

10.224 Waste. A waste tank of sufficient size (500-600 gallons) to be constructed in undercarriage to accommodate wastes. Provision to

empty wastes into approved sewer system when convenient is necessary.

10.23 Construction

10.231 Exterior walls to be constructed of 2" X 2" framing, ¼" plywood outside sheathing with aluminum siding and vapor barrier as necessary, and ¼" inside paneling. Walls to be insulated with fiberglass or foam.

10.232 Interior walls to be constructed of 2" X 2" framing with ¼" paneling on both sides.

10.233 Ceiling to be paneling with joists to be cut from 2" X 8". The top of the joists to be cut on a radius so that the roof will be rounded from the sides of the unit (see Figure 10). Roof to be constructed of 3/8" plywood with covering as appropriate. Insulated as appropriate.

10.234 Floor to be constructed of 3/4" plywood with 3/8" underlayment for tiled or carpeted floors as appropriate.

10.235 Undercarriage to be constructed of steel members of appropriate size to support the load and with appropriate spacing to sufficiently support the floor. Double or triple axle construction as necessary. Entire unit to be constructed as low as possible for low center of gravity and ease of access.

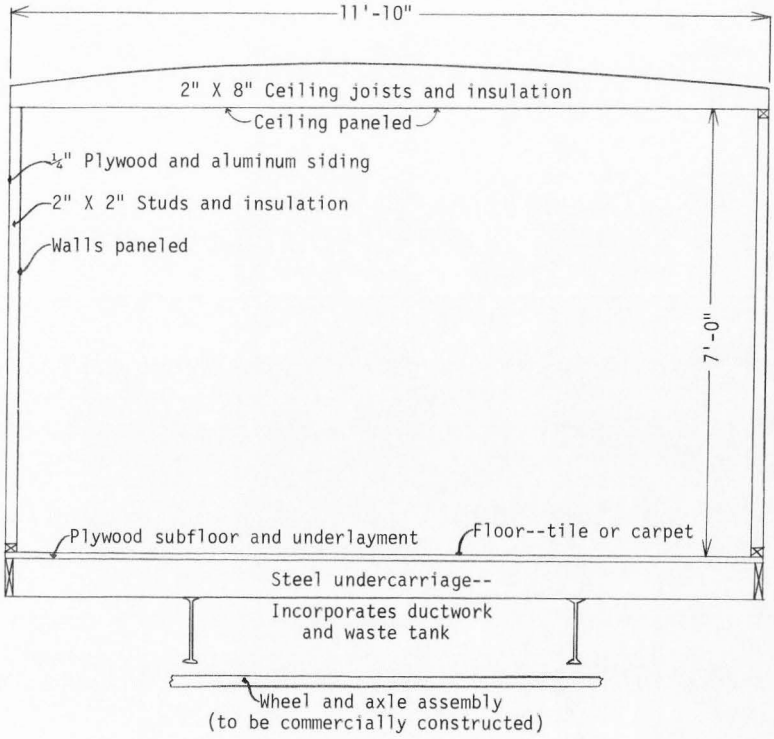


Figure 10. Sectional view showing proposed construction.

10.24 Special provisions.

10.241 The trade and industrial mobile unit should be constructed so that a 6'-6" X 12' section of the walls near the rear can be folded out as floor for additional working space.

10.242 A system must be devised to mount and demount tool cabinets, machines, and equipment on the walls and floors of the mobile units as equipment is changed for the various programs. Provision should be made to make equipment changes without numerous holes in floors and walls.

10.243 Special consideration must be given to the security of the contents of the mobile units, as they may be in remote locations for extended periods of time.

10.244 All storage cabinets and other facilities must be designed for the safe transport of contents over back-country roads.

10.245 Doors must be large enough to accommodate the largest piece of equipment or furnishings which may be utilized in the facility.

10.246 There should be sufficient seating, work spaces, and equipment for 12-15 students at one time.

10.247 Chalkboards, tackboards, and projection screen to be provided at front of each teaching area.

10.248 Coat rack should be provided near entrance door.

10.249 Provision should be made for evaporative air coolers in roof.

10.3 *Specifications of individual units.*

10.31 Home economics, guidance, business, and drafting unit.

10.311 Major equipment to be housed. Provision should be made for floor and/or wall space for the following furnishings or equipment:

Home economics:

Item	Approximate size
10 Work tables	2' X 4' X 29"
19 Stackable chairs	
1 File cabinet (4 drawer)	
1 Cutting table	4' X 8' X 36"
1 Twin bed	
1 Wardrobe storage unit	
1 Tote tray storage unit	
8 Portable sewing machines	
Storage for sewing machines	
Other storage as convenient for periodicals, catalogs, audio-visual equipment, etc.	

Guidance:

Item	Approximate size
10 Work tables	2' X 4' X 29"
19 Stackable chairs	

	Item	Approximate size
1	File cabinet (4 drawer)	
	Storage for audio-visual equipment	
	Storage for materials used in testing programs associated with guidance.	
	Storage for instructional materials used in guidance programs	
	Storage for books, periodicals, etc.	

Business education:

	Item	Approximate size
12	Typing tables	18" X 42" X 30"
12	Stackable chairs	
1	Instructor's table	2' X 4' X 29"
1	Instructor's chair	
1	File cabinet (4 drawer)	
12	Tables for business machines	2' X 4' X 29"
12	Stackable chairs	
	Storage for business machines and other equipment or instructional materials	

Drafting:

	Item	Approximate size
6	Drafting tables	3' X 4' X 38"
6	Student stools	
1	Instructor's table	2' X 4' X 29"

	Item	Approximate size
1	Instructor's chair	
1	File cabinet (4 drawer)	
1	Light table	
1	Blueprint machine	
6	Work tables	2' X 4' X 29"
6	Stackable chairs	
	Storage for books, periodicals, and drafting supplies	

Special provisions:

Item
Floor should be carpeted.
Numerous electrical outlets at convenient locations are required for business machines, typewriters, and sewing machines.
(See Figure 11 for suggested layout.)

10.32 Building trades, crafts, automotive, metal unit.

10.321 Major equipment to be housed. Provision should be made for floor and/or wall space for the following furnishings or equipment:

Building trades:

	Item	Approximate size
8	Work tables	2' X 4' X 29"
16	Stackable chairs	
1	Instructor's table	2' X 3' X 29"
1	Instructor's chair	
1	File cabinet (4 drawer)	

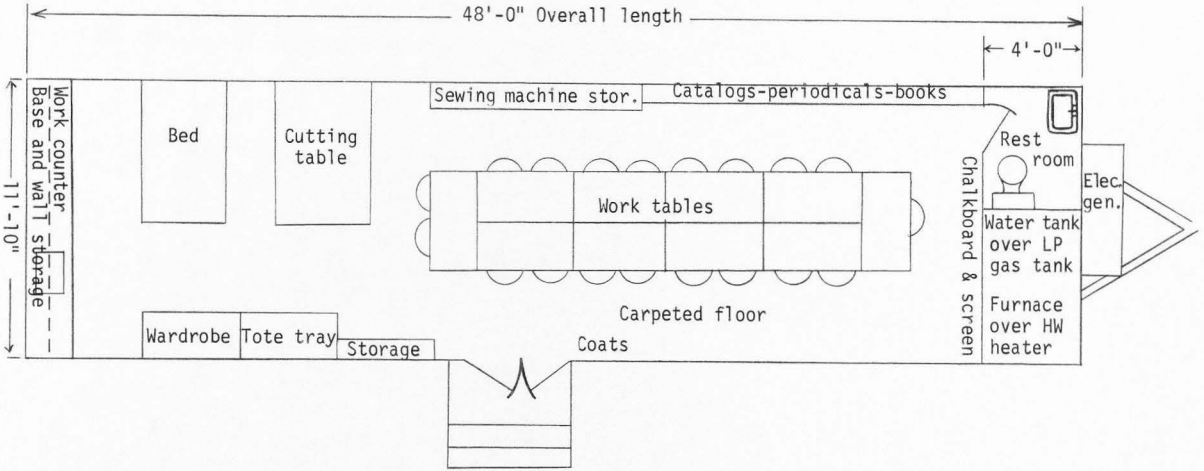


Figure 11. Mobile unit outfitted for home economics (suggested layout). (Equipment can be changed to accommodate: business education, drafting, or guidance. Work tables can be in a variety of arrangements.)

	Item	Approximate size
1	Bookcase	
1	Tool cabinet	15" X 3' X 78"
1	7" Grinder	
1	10" Table saw	
1	4-Place woodworking bench	

Crafts:

	Item	Approximate size
6	Potter's wheels	
	Storage for clay and pottery articles in various stages of production and finishing	
1	Trim saw-grinder-polisher unit (water required)	
1	Bench furnace (gas required)	
1	Tool cabinet	
1	Enameling kiln	
1	Tumbling machine	
2	Floor looms	
6	Table-top looms	
2	Work benches w/lockers	54" X 64" X 29"
1	Work bench w/lockers	54" X 64" X 33"
	Storage for materials and student projects	
1	Instructor's table	
1	Instructor's chair	
1	File cabinet (4 drawer)	

Automotive:

	Item	Approximate size
8	Work tables	2' X 4' X 29"
16	Stackable chairs	
1	Instructor's table	2' X 3' X 29"
1	Instructor's chair	
1	File cabinet (4 drawer)	
1	Solvent tank	
1	7" Grinder	
1	Small engine test stand w/dynamometer	
1	Tool cabinet	
1	Hydraulic floor jack	
2	Work benches w/lockers	54" X 64" X 33"
	Storage for supplies and student projects	
	Storage for 8 1-cylinder engines	

Metalworking:

	Item	Approximate size
8	Work tables	2' X 4' X 29"
16	Stackable chairs	
1	Instructor's table	2' X 3' X 29"
1	Instructor's chair	
1	File cabinet (4 drawer)	
2	Electric welders	
2	Portable oxy-acetylene units	
1	Quench tank	

Item	Approximate size
1 Box and pan brake	
1 Bar folder	
1 Combination rotary machine	
1 Soldering bench	
1 Work bench	40" X 60" X 30"
1 Stake bench	42" X 96" X 33"
1 Tool cabinet	
2 Metal lathes	
Storage for supplies and student projects	

Special provisions:

Floor should be asphalt tile.

6'-6" X 12' Wall sections near rear of unit are to be constructed so they can be folded down for additional floor space. Inside surface of these sections to be covered with 1/2" plywood, 3/8" underlayment, and asphalt tile. There should be convenient provision to raise the sections into locked position for security reasons and for transport. (See Figure 12 for suggested layout.)

10.33 Electronics-electrical repair unit.

10.331 Major equipment to be housed. Provision should be made for floor and/or wall space for the following equipment or furnishings:

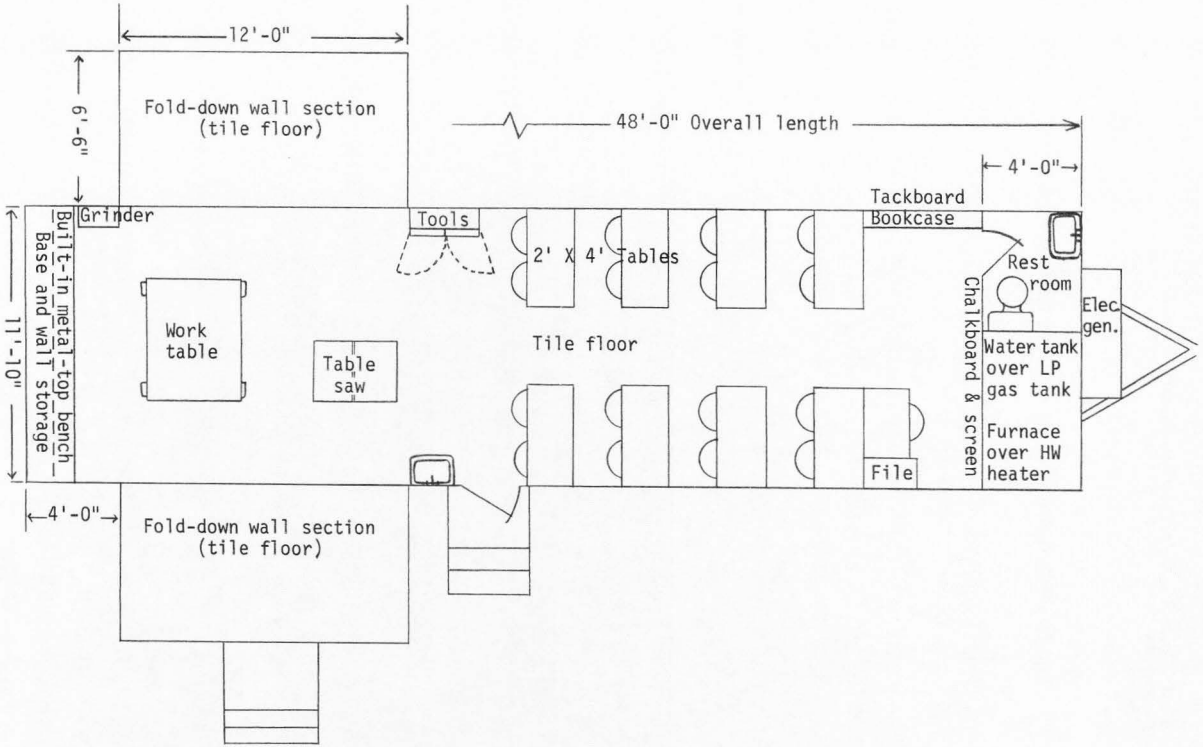


Figure 12. Trade and industrial mobile unit (suggested layout). (Outfitted for carpentry; equipment can be changed to accommodate: crafts, automotive, or metals.)

	Item	Approximate size	Utilities
3	Double face electrical benches	4' X 6' X 39"	115 V
2	Single face electrical benches	2' X 6' X 39"	115 V
16	Stools	26" high	
1	Demonstration table	2' X 4' X 39"	
1	Instructor's chair		
1	Bookcase	10" X 5' X 3'	
	Tool cabinets		
	Storage for meters, power supplies, scopes, generators, test equipment		
2	Metal work benches	3' X 6' X 32"	
	Mounted on bench:		
1	6" Grinder		115 V
1	15" Drill press		115 V
1	24" Sheet metal shear		
1	24" Box and pan brake		
1	Notcher		
2	Vises		

(See Figure 13 for suggested layout.)

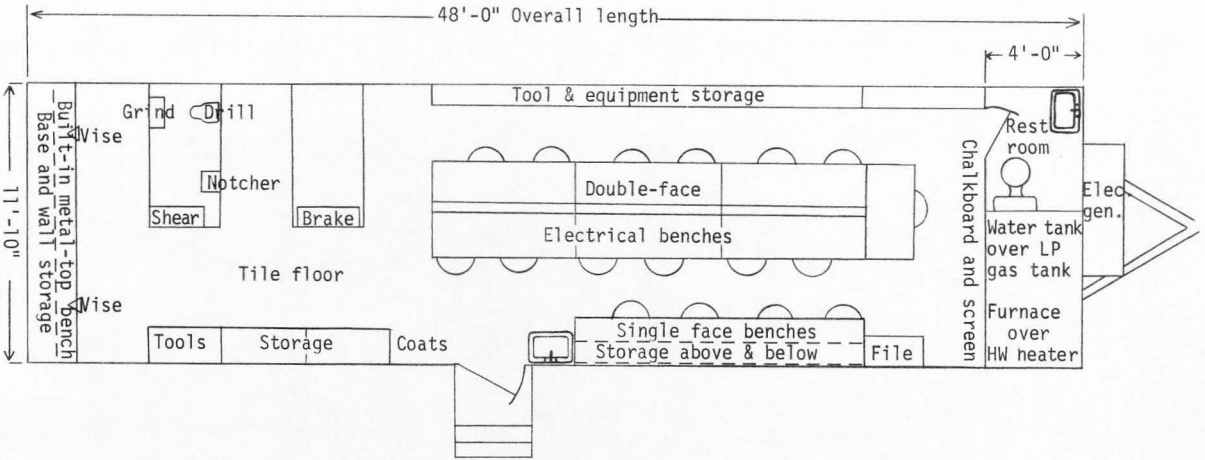


Figure 13. Electronics-electrical repair mobile unit (suggested layout).

LITERATURE CITED

Books and Pamphlets

American Council of Industrial Arts Supervisors. 1971. *Guidance in industrial arts education for the '70s.* American Industrial Arts Association, Washington, D.C. 21 p.

American Vocational Association. 1968. *New designs for the challenge of the 1970's.* Washington, D.C. 12 p.

American Vocational Association. 1971. *Vocational-technical terminology.* Publications Committee, Washington, D.C. 77 p.

Cochran, Leslie H. 1970. *Innovative programs in industrial education.* McKnight and McKnight Publishing Company, Bloomington, Illinois. 114 p.

Draper, Dale C. 1967. *Educating for work.* National Committee on Secondary Education of the National Association of Secondary School Principals, Washington, D.C. 115 p.

Nerden, Joseph T. [1970?] *Vocational-technical facilities for secondary schools: A planning guide.* Council of Educational Facility Planners, Columbus, Ohio. 44 p.

Rhodes, James A. 1969. *Alternative to a decadent society.* Howard W. Sams and Company, Inc., Indianapolis, Indiana. 108 p.

Schmitt, Marshall L., and James L. Taylor. 1971. Programming the I-A plant for new developments, p. 50-54. In *Modern school shop planning.* Sixth edition. Prakken Publications, Inc., Ann Arbor, Michigan.

Striner, Herbert E. 1967. *1984 and beyond: The world of work.* W. E. Upjohn Institute for Employment Research, Kalamazoo, Michigan. October. 8 p.

Tyler, Ralph W. 1971. Purposes of our schools, p. 59-68. In James C. Stone (Ed.). *Readings in the foundations of education.* Second edition. Thomas Y. Crowell Company, Inc., New York.

Venn, Grant. 1964. *Man, education, and work.* American Council on Education, Washington, D.C. 184 p.

Periodicals

Adams, Velma A. 1970. Vocational training: Still for someone else's children. *School Management* 14(9):12-15. September.

Arnold, Walter M. 1971. Washington report. *Industrial Arts and Vocational Education* 60(9):4-6. December.

Burkette, Lowell A. 1972. AVA formulates position on career education. *American Vocational Journal* 47(1):9-10. January.

Farnsworth, Clayton E. 1967. Trends in vocational technical education and how to plan facilities for them. *Industrial Arts and Vocational Education* 56(1):23-25+. January.

Feirer, John L. 1969. More on vo-tech facilities. *Industrial Arts and Vocational Education* 58(3):33. March.

Feldman, Marvin J. 1970. Zeroing in on a program of zero rejects. *School Shop* 29(8):86-90+. April.

Jelden, D. L. 1972. Learning activity packets for individualized instruction. *Man/Society/Technology* 31(5):138-140. February.

Kabakjian, Edward. 1971. Is career education the answer? *Monitor* 3(2):8. Fall.

Larson, Milton E. 1969a. A checklist of facilities planning musts. *School Shop* 28(8):98-99. April.

Larson, Milton E. 1969b. Planning concept: Facilities and equipment for technical education. *Industrial Arts and Vocational Education* 58(3):34-40. March.

Marland, Sidney P. 1971a. Commissioner of Education speaks out in support of vocational youth groups. *American Vocational Journal* 46(9):22-23. September.

Marland, Sidney P. 1971b. Marland on career education. *American Education* 7(9):25-28. November.

Mochon, Clint. 1970. An architect looks...new concepts in industrial technical education facilities. *Industrial Arts and Vocational Education* 59(3):TE6-TE10. March.

Resnick, Harold S., and Neil S. Levine. 1970. Detroit: A model for multi-faceted action. *School Shop* 29(8):91-94+. April.

Russo, Michael. 1965. The what and why of the area vocational school. *Industrial Arts and Vocational Education* 54(9):28-30. November.

Task force report on career education. 1972. *American Vocational Journal* 47(1):12-14. January.

Wenig, Robert E. 1969. A synthesis of industrial arts laboratory facility planning. *Industrial Arts and Vocational Education* 58(3):55-57. March.

Where the jobs will be in the '70s. 1971. *U.S. News & World Report* 71(10):68-71. September.

White, Thomas R. 1971. The area vocational school, an emerging institution. *Phi Delta Kappan* 53(3):189-191. November.

Williams, Robert Bruce. 1970. A philosophical reappraisal. *Journal of Industrial Arts Education.* Special convention issue, p. 13-15.

Wills, Vernon L. 1970. Education for the professional and the plumber. *School and Community* 56(8):27. April.

Government Publications

Department of Health, Education, and Welfare. 1968. *Organization and operation of a local program of vocational education.* Washington, D.C. 86 p.

Department of Health, Education, and Welfare. 1969. *Annual report.* National Advisory Council on Vocational Education, Washington, D.C. July. 15 p.

Kunzman, Leonard E. 1970. *Career education in Oregon.* Oregon State Board of Education, Salem, Oregon. August.

Sanders, George, and William A. Dennis. 1971. *A challenge to vocational education facility planners.* Bureau of Adult, Vocational, and Technical Education, U.S. Office of Education, Washington, D.C. April. 7 p.

Talagan, Dean P. 1970. *A comprehensive occupational education program.* Wyoming State Department of Education, Cheyenne, Wyoming.

Taylor, James L., and Johnie Christian. 1965. *Planning functional facilities for home economics education.* U.S. Department of Health, Education, and Welfare, Washington, D.C. OE-83015. 48 p.

United States Department of Labor. 1971. *Occupational manpower and training needs.* Bulletin 1701. Washington, D.C. 81 p.

United States Office of Education. 1969. *The vocational education amendments of 1968.* Washington, D.C. February. 10 p.

Utah Department of Employment Security. No date. Selected occupations and their training requirements for state of Utah. Salt Lake City, Utah. 5 p. (Mimeographed)

Utah Department of Employment Security. 1970. *Job information form series 1970.* Salt Lake City, Utah. n.p.

Utah Department of Employment Security. 1971. Utah comprehensive area manpower plan fiscal year 1971. Part A. Salt Lake City, Utah. (Unpublished)

Utah State Advisory Council for Vocational and Technical Education. 1970. *Annual report: But what about Utah's vital 80%.* Salt Lake City, Utah. n.p.

Newspapers

Berg, Robert. 1971. New education: Switch from liberal arts major to vo-ed course sweeps country. *Deseret News* (Salt Lake City, Utah), December 23, Section A, p. 21.

Carey, Max. 1971. The crafts: Five million opportunities. *Occupational Outlook Quarterly*, Spring, p. 2-11.

Cunniff, John. 1970. Is degree necessary? *Deseret News* (Salt Lake City, Utah), June 30, Section B, p. 6.

Education for jobs: Utah's new priority. 1971. *Deseret News* (Salt Lake City, Utah), November 11, Section A, p. 16.

Expand vo-ed, Utahn's agree. 1971. *Deseret News* (Salt Lake City, Utah), June 30, Section B, p. 7.

McDonald, Hugh. 1970. Jobs: What to look for in 1980. *Deseret News* (Salt Lake City, Utah), June 6, Section A, p. 12.

Rafferty, Max. 1970. It's his life, pop: Better a good plumber than a bad lawyer. *Salt Lake Tribune*, May 3, Section A, p. 10.

Unpublished Materials

Black, Calvin. 1972. San Juan County Commissioner. Personal interview, Blanding, Utah. March 21.

Cobb County Public Schools. 1971. Occupational and career development program. Reply by Georgia Marietta to personal correspondence from Joel Smith, project director. March 17.

Department of Employment Security. 1971. San Juan County Newsletter (Blanding, Utah), Fourth Quarter. 1 p.

Golden, Robert E. 1972. Public Information Officer, Arizona Department of Education. Personal correspondence. April 19.

San Juan High School. 1970. Enrollment Report, Blanding, Utah. October 1.

San Juan High School. 1971. Enrollment Report, Blanding, Utah. October 1.

San Juan School District. 1970. Enrollment Report, Monticello, Utah. October 1.

San Juan School District. 1971. Enrollment Report, Monticello, Utah. October 1.

Shumway, Bruce. 1971. Director, Division of Family Services, Blanding, Utah. Personal interview. November 17.

Warner, Ray D., Floyd Braunberger, Lila Lee Christensen, and Leland Stenquist. No date. World of work. Utah State Board of Education, Salt Lake City, Utah. 9 p. (Pamphlet)

Previous Studies of the Area

Bass, Willard P. 1969. *The American Indian high school graduate in the southwest.* Southwestern Cooperative Educational Laboratory, Inc., Albuquerque, New Mexico. July. 101 p.

Douglas, Dorothy, Charles W. Minshall, Fred Goodman, and Janet Baker. 1971. *An analysis of the economic structure and industrial potential of the Four Corners Region.* Battelle Memorial Institute, Columbus Laboratories, Columbus, Ohio. May.

Moffitt, J. C. 1971. An analysis of the educational program at San Juan High School. San Juan School District, Monticello, Utah. 92 p.

Navajo Area CAMPS Committee. 1971. The Navajo nation comprehensive manpower plan for fiscal year 1972. n.p.

Nichols, Mark. 1969. *A proposed supplement to the state plan for vocational-technical education in Utah.* Sterling Institute, Washington, D.C. September. 68 p.

Owens, Charles S., and Willard P. Bass. 1969. *The American Indian high school dropout in the southwest.* Southwestern Cooperative Educational Laboratory, Inc., Albuquerque, New Mexico. January. 37 p.

Planning and Research Associates. 1968a. *Master plan, San Juan County, Utah - Blanding, Monticello.* Salt Lake City, Utah. October. 29 p.

Planning and Research Associates. 1968b. *Population and economic base study, San Juan County, Utah.* Salt Lake City, Utah. 97 p.

Reno, Phillip. 1969. *Vocational education needs and opportunities for Indians.* Sterling Institute, Washington, D.C. September. 29 p.

Sterling Institute. 1969. *Vocational-technical education study--interim report.* Washington, D.C. March. 138 p.

Sterling Institute. [1971?] *A master plan for the development of vocational-technical education in the area served by the Four Corners Economic Development Region.* Washington, D.C. 136 p.

Utah State Board of Education. 1969. *San Juan School District study of curriculum and facilities.* Salt Lake City, Utah. June. 140 p.

Westinghouse Electric Corporation. 1969. *Four Corners Regional Development Study Program.* Baltimore, Maryland. June.

APPENDIX A

OCCUPATIONAL OUTLOOK AND EMPLOYMENT PROJECTIONS

Appendix A-1

Projections--State of Utah

Table 19. Utah nonfarm wage and salaried jobs--occupation by industry

Occupation	State total	Mfg.	Mining	Constr.	Transp.	Trade		Finance	Service	Govt.
						Whsle.	Retail			
1970 Projected										
Professional	83,500	8,200	1,100	1,300	3,000	3,400	4,500	2,900	17,600	41,600
Clerical	69,300	6,100	700	700	4,900	5,000	8,200	8,700	11,100	24,100
Sales	26,300	2,100	a	200	300	3,400	17,700	800	1,900	100
Service	54,500	1,300	100	100	500	200	15,400	1,500	20,100	15,200
Agricultural	2,900	100	--	a	a	100	a	100	500	2,100
Processing	12,800	9,800	1,200	100	a	900	500	--	100	200
Machine	23,500	7,900	1,700	600	2,400	1,200	2,700	a	1,300	5,700
Bench work	13,200	8,100	a	100	100	200	1,000	--	1,100	2,600
Structural	35,600	5,200	2,200	13,300	2,300	1,300	1,300	400	1,400	8,300
Miscellaneous	48,500	7,800	4,300	1,300	9,600	4,200	8,900	200	2,400	9,900
Total	370,100	56,600	11,300	17,500	23,100	19,800	60,100	14,700	57,400	109,600

Table 19. Continued

Occupation	State total	Mfg.	Mining	Constr.	Transp.	Trade		Finance	Service	Govt.
						Whsle.	Retail			
1975 Projected										
Professional	98,100	9,000	1,100	1,600	3,000	3,800	5,200	3,300	22,200	49,000
Clerical	79,100	6,800	600	900	4,900	5,600	9,300	10,300	13,600	27,100
Sales	30,200	2,300	a	200	300	3,800	20,300	900	2,300	100
Service	66,400	1,400	100	100	500	300	18,900	1,700	25,600	18,000
Agricultural	3,200	100	--	a	a	100	a	100	600	2,300
Process	13,300	10,100	1,200	100	a	1,000	600	--	100	200
Machine	26,100	9,700	1,600	700	2,100	1,400	2.900	a	1,800	5,900
Bench work	15,700	10,200	a	100	a	200	1,200	--	1,300	2,700
Structural	41,000	5,900	2,100	16,900	2,100	1,400	1,300	500	1,700	9,100
Miscellaneous	51,800	8,500	4,200	1,500	8.900	4,600	10,400	200	3,000	10,600
Total	425,000	64,000	11,000	22,000	21,800	22,200	70,000	17,000	72,000	125,000
Increase or decrease	+54,900	+7,400	-300	+4,500	-1,300	+2,400	+9,900	+2,300	+14,600	+15,400

[a]Less than 50.
Source: Nichols, 1969, p. 43.

Appendix A-2

Annual Openings--Selected Occupations--Utah

Table 20. Annual new and replacement jobs for selected occupations in Utah, 1967-1975[a]

Occupational title	New and replacement jobs			
	State	Salt Lake labor area	Ogden labor area	Balance of state
Automobile mechanic	200	120	30	50
Bookkeeper	300	180	50	70
Carpenter	300	180	40	80
Cashier	200	120	30	50
Clerk, general, and general office	700	420	110	170
Cook	500	275	75	150
Dental assistant	100	55	15	30
Electrician	100	60	15	25
Engineer	600	250	160	190
Nurses aide	600	325	95	180
Nurse, licensed practical	200	105	30	65
Nurse, registered	400	210	60	130
Operating engineer	200	120	30	50
Secretary	500	280	100	120
Sewing machine mechanic	200	110	40	50
Stenographer	300	175	50	75
Waitress	400	230	50	120
Welder	100	55	15	30

[a]Includes those occupations with substantial expected openings where a history of past shortages has existed (traditionally hard-to-fill occupations).

Source: Utah Department of Employment Security, 1971, insert between p. 5-6.

Appendix A-3

Annual Openings--Selected Occupations--Utah

Table 21. Projected job openings in Utah, 1970-1975[a]

Job	1970 employment	Average annual employment opportunities	Education required
Accountant	2,400	130	B.S.--accountant
Aircraft mechanic	1,100	50	H.S. + apprentice or military
Assembler, bench	1,300	200	10th grade or H.S.
Athletic coach	500	35	B.S. + certificate
Auto body repairman	600	50	H.S. or tech. school
Auto mechanic	3,500	130	H.S. or tech. school
Auto service station attendant	4,100	190	H.S. preferred
Baker		"Ample"	H.S. not required--apprentice
Barber	1,600	High turnover	H.S. + trade school
Bookkeeper	3,100	280	H.S. + preferred
Carpenter	3,700	260 + related	H.S. preferred
Cashier-checker	2,300	210	H.S. preferred
Cement mason	500	40	H.S. not required--apprentice
Clerk-typist	7,400	400	H.S. required + preferred
Compositor	800	50	H.S. required
Construction worker	1,700	150	No requirements
Cosmetologist	2,200	240	H.S. not required--vocational school
Counselor (rehab.)	400	45	B.S.--counseling
Cook (dinner-short order)	1,500	150	H.S. not required
Dental assistant	900	40	H.S. +
Detailer (drafting)	2,300	240	H.S. + trade school
Draftsman, commercial	2,300	240	H.S. + trade school
Electrical appliance repair	600	50	H.S. not required, OJT or voc. school
Electrician	1,500	80	H.S., voc. school--apprentice
Electronic assembler	1,300	50	10th grade H.S. preferred
File clerk	800	60	H.S. + voc. school
Firefighter	720	40	H.S., Civil Service test
Host/hostess	500	50	H.S. preferred

Table 21. Continued

Job	1970 employment	Average annual employment opportunities	Education required
Inventory clerk	640	50	H.S. + preferred
Key punch operator	2,000	200	H.S. + business school preferred
Librarian	500	60	B.S.--library science
Machinist	1,700	90	H.S. if apprentice
Manager, office	2,700	160	B.S. or business college
Medical secretary	500	50	H.S. + business school
Nurse aide	3,000	330	No requirements--18 years old
Nurse (LPN)	1,500	180	LPN course post-H.S.
Nurse (RN)	2,300	270	H.S. + 3-4 years college
Painter	1,300	70	H.S. if apprentice
Receptionist	1,000	110	H.S. + preferred
Roofer	300	40	No requirements--apprentice
Sales clerk	2,000	130	10th grade to college
Salesman, general	5,600	350	H.S. + preferred
Secretary	6,700	590	H.S. + business school preferred
Sewing machine operator	3,900	250	H.S. not required
Stenographer	4,600	380	H.S. + business school preferred
Stock clerk	2,800	170	H.S. preferred
Struc. steel worker	700	50	H.S. preferred--apprentice
Teacher, elementary	7,600	940	B.S. + certificate
Teacher, secondary	8,600	1,000	B.S. + certificate
Telephone operator	1,000	70	H.S. preferred + also
Technical writer	500	40	H.S. or BS in engineering
Teller, bank	1,200	110	H.S. + business school
Waiter-waitress	5,200	460	H.S. not required
Welder, combination	1,500	80	H.S. not required, OJT, vocational school
Teacher, handicapped	100	Shortage	B.S. + certificate

[a]Selected occupations showing substantial growth.
Source: Utah Department of Employment Security, 1970.

Appendix A-4

Projected Industry Growth--Four States

Table 22. Projected industry growth rates by state for the period 1967-1975

	Arizona (%)	Colorado (%)	New Mexico (%)	Utah (%)
Agriculture	-1.0	-1.0	-4.0	-3.5
Mining	1.0	1.0	-1.5	-2.5
Construction	-2.5	0.0	-1.0	2.0
Manufacturing	7.5	0.5	1.5	2.0
Trans., comm., and P.U.	1.0	1.0	0.0	0.5
Wholesale trade	4.0	2.0	2.0	3.5
Retail trade	4.0	2.0	2.0	2.5
Fin., ins., real estate	7.0	3.0	4.0	3.0
Services	7.5	4.0	5.0	6.5
Federal government	7.0	1.0	4.0	5.5
State and local government	7.5	3.0	4.0	8.0
Other	2.0	-0.5	0.0	0.5
Averages	4.9	1.9	2.0	3.6

Source: Sterling Institute (1971), p. 22.

Appendix A-5

Four Corners Projected Economy

Table 23. Four Corners Region economy projected to 1970, 1980, and 1990

	Four Corners Region (92 counties)					
	1960 Census	1967	1970	1980	1990	1990 Innovative
Manufacturing	57,158	50,000	57,100	82,000	112,000	137,000
Mining	32,486	34,000	35,000	45,000	58,000	80,000
Agriculture	49,566	47,000	48,000	54,000	63,000	70,000
Construction	45,750	42,000	47,000	62,000	80,000	110,000
Transport, etc.	39,855	39,000	41,000	47,000	55,000	62,000
Trade	101,143	125,000	140,000	180,000	230,000	275,000
Finance, etc.	16,737	21,000	23,000	30,000	39,000	55,000
Education	40,373	53,000	56,000	69,000	85,000	110,000
Public administration	35,812	45,000	48,000	60,000	75,000	98,000
All other	115,707	146,000	160,900	204,000	283,000	353,000
Total employment	534,587	602,000	656,000	833,000	1,080,000	1,350,000
Included in above						
Tourism	31,550	38,000	41,600	61,000	88,000	108,000
Research and development	15,000	17,000	19,000	30,000	48,000	70,000

Table 23. Continued

	SIC code	Four Corners Region (92 counties) 1967	1970	1980	1990	1990 Innovative
Manufacturing categories						
Food	20	8,300	9,000	11,500	14,400	16,100
Textiles	22	200	200	300	400	500
Apparel	23	1,200	1,500	3,500	6,000	7,200
Lumber and wood products	24	3,500	3,600	3,900	4,200	4,600
Furniture	25	1,000	1,300	1,700	2,200	2,500
Paper	26	700	900	1,300	1,800	2,200
Printing and publishing	27	4,800	5,200	6,800	8,600	9,900
Chemicals	28	800	1,000	1,600	2,400	3,200
Petroleum and coal	29	600	700	1,100	1,600	2,200
Rubber and plastics	30	800	1,100	2,400	4,000	5,200
Leather	31	200	300	400	500	600
Stone, clay, and glass	32	2,000	2,400	3,000	3,500	4,000
Primary metals	33	12,800	13,000	14,800	16,500	18,500
Fabricated metals	34	1,500	2,000	4,200	6,800	8,300
Machinery, non-electrical	35	2,000	2,500	4,400	6,700	9,000
Electrical machinery	36	3,300	4,500	8,500	14,000	18,300
Transportation equipment	37	1,100	1,500	2,200	3,000	4,400
Instruments	38	1,200	1,600	3,500	6,000	8,600
Miscellaneous	39	1,500	1,800	2.900	4,400	5,300
Ordnance	19	2,500	3,000	4,000	5,000	6,400
Total		50,000	57,100	82,000	112,000	137,000

Source: Westinghouse Electric Corporation (1969), p. D-8, D-9.

Appendix A-6

Core Area Projected Economy

Table 24. Four Corners core area economy projected to 1990

	Core area (thirteen counties)			
	1960	1967	1990	1990 Innovative
Manufacturing	5,015	5,100	16,400	21,500
Mining	6,690	6,200	12,000	16,400
Agriculture	5,497	5,000	6,800	7,800
Construction	7,067	6,500	13,000	17,500
Transport, etc.	6,251	6,100	8.800	10,800
Trade	11,070	12,800	24,200	30,700
Finance, etc.	1,352	1,600	3,700	5,300
Education	5,018	7,000	12,000	17,500
Public administration	4,005	5,000	9,200	14,000
All other	12,977	14,900	30,100	39,700
Total employment	64,942	70,200	136,200	181,200
Included in above				
Tourism	3,500	4,200	10,000	13,000
Research and development	50	100	8,000	15,000
Manufacturing categories				
Food	646	700	1,600	2,000
Textiles	50	100	200	200
Apparel	4	100	800	1,100
Lumber and wood products	1,800	1,100	1,300	1,400
Furniture	226	200	400	500
Paper	400	500	800	900
Printing and publishing	392	400	1,000	1,200
Chemicals	227	200	600	800
Petroleum and coal	200	300	600	800
Rubber and plastics	100	100	800	1,100
Leather	99	100	300	300
Stone, clay, glass	200	200	400	500
Primary metals	10	0	400	500
Fabricated metals	84	100	800	1,100
Machinery, non-electrical	163	200	1,000	1,400
Electrical machinery	16	500	2,800	3,600
Transportation equipment	13	0	400	700
Instruments	20	0	1,000	1,600
Miscellaneous	455	300	900	1,200
Ordnance	0	0	300	600
Total	5,015	5,100	16,400	21,500

Source: Westinghouse Electric Corporation (1969), p. D-10.

Appendix A-7

Most Feasible Industries--Four Corners

Table 25. Ranking of best industries for the Four Corners Region according to feasibility of an activity for a subregion[a]

1/0 Sector	SIC	Description	Subregions — Regions Immediately Surrounding San Juan																			
			Coconino, Ariz.	Mohave, Ariz.	Gila, Ariz.	Graham, Ariz.	Denver, Colo.	El Paso, Colo.	Pueblo, Colo	Alamosa, Colo.	LaPlata, Colo.	Mesa, Colo.	San Juan, N.M.	Taos, N. M.	Bernalillo, N.M.	Curry, N. M.	Grant, N.M.	Chaves, N.M.	Utah, Utah	Sevier, Utah	Iron, Utah	Uintah, Utah	Grand, Utah
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
23.02	2522	Metal office furniture	2	2	1	1	2	2	1	2	1	1	1	1	2	1	2	1	1	2	2	2	2
36.11	3272	Concrete products necessary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
47.04	3548	Metalworking machinery necessary	3	3	1	1	4	3	3	1	2	1	3	3	4	2	2	2	4	2	2	2	1
48.01	3551	Food products machinery	2	2	1	2	4	3	2	1	2	2	2	2	3	1	2	2	2	2	1	1	2
48.05	3555	Printing trades machinery	1	1	1	3	3	2	1	1	2	3	1	1	1	1	1	2	1	1	1	1	3
51.03	3576	Scales and balances	1	1	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
51.04	3579	Office machines necessary	1	1	1	1	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
53.01	3611	Electric measuring instruments	2	2	1	1	4	3	3	1	2	1	2	2	2	3	1	2	3	1	2	1	2
64.10	3988	Morticians goods	2	1	2	3	3	2	1	2	2	2	1	2	1	1	1	2	1	1	1	1	3
48.04	3554	Paper industries machinery	2	2	1	1	4	3	3	2	1	1	2	3	3	1	2	1	2	2	2	2	2
45.02	3532	Mining machinery	4	4	3	4	4	4	4	2	3	4	3			2	3	3	4	3	3	1	3
48.03	3553	Woodworking machinery	3	3	2	3			4	2	3	4	3	4	4	3	3	3	4	2	2	1	3
26.05	2751,2752	Commercial printing	2	3	4	3	1		4	2	3	3	2	3		4	2	3		1	2	2	4
36.15	3281	Cut stone and stone products	1	1	1	3			3	2		3	3	1	1	2	1	1	2	3	2	2	2
51.02	3572	Typewriters	1	3	2	2			2	4	3	2	2	1	1		1	1	2	1	1	1	3
17.09	2298	Cordage and twine	2	2	2	3				3	3	3	2	2	3	4	2	3		1	1	2	4
40.05	3442	Metal doors, sash, and trim	3	2			1	1	2	3	4		4	3	2	2	3	4	3	3	3	3	
44.00	3522	Farm machinery		4	3	2	2	3	4	3	2	2	3		4	2	4	3	3			4	2
47.01	3541	Machine Tools, metal cutting type	3	3	2	4	4	4	3	2			4	3	3	2	3	4	4	2	1	2	
62.04	3841	Surgical and medical instruments	2	2	3		2	1	3	4	4	4	4	2	2	3	3		2	3	3	3	
26.04	2741	Miscellaneous publishing	2	1			3	3	2	2	4		3	2	2	4	4	4		2	2	2	
27.02	2871,2872	Fertilizers	4	3		2	3	4	2		2	1	1	2	2	4	3	1	2				2
36.03	3253	Ceramic wall and floor tile	1	1	2	3	1	1	1		4	2	1	1	1	3	1	1	1				
49.03	3564	Blowers and fans		4	2	2				3	1	2	3		4	2	4	2	4	3	3	2	1
55.01	3641	Electric lamps	3	3	2	1				2	1	1	3	4	4		2	1		2	3	4	1
62.05	3842	Surgical appliances and supplies	2	2	3	4					4	3	3	2	2	3	2	3	4	4	4	4	
23.04	2541	Wood partitions and fixtures	3	2	3		1	1	2	4			4	2	2	2	4		2		4	4	
23.05	2542	Metal partitions and fixtures	4	3	4		3	2	3	3				3	3	3	4		2	2	2	3	
36.05	3259	Structural clay products necessary	1	1	3		2	1	1				2	1	1	3	1	3	1	3	2		
45.01	3531	Construction machinery		4	3	1	2	2	3	1	1	2	4			2	4	2	3				1
47.02	3542	Machine tools, metal forming type	4		2	1		4	3	1	1	2	3			3	4	2		3	3		1
23.01	2521	Wood office furniture	4	2			2	2	3				4	3	4		4	4	2	3	4	4	
40.08	3446	Architectural metal work		3	4		2	1	2	2				4	3	2	4		2	3	3	3	
48.02	3552	Textile machinery	3	3	4			4	4				4	4	3	3	3		3	3	3	3	

Table 25. Continued

1/0 Sector	SIC	Description	Coconino, Ariz.	Mohave, Ariz.	Gila, Ariz.	Graham, Ariz.	Denver, Colo.	El Paso, Colo.	Pueblo, Colo.	Alamosa, Colo.	LaPlata, Colo.	Mesa, Colo.	San Juan, N.M.	Taos, N. M.	Bernalillo, N.M.	Curry, N.M.	Grant, N.M.	Chaves, N. M.	Utah, Utah	Sevier, Utah	Iron, Utah	Uintah, Utah	Grand, Utah
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
49.07	3569	General industrial machinery necessary	4	4			2	1	1	1				3	3	1	4		2	2	1	3	
36.08	3264	Porcelain electrical supplies	3	4	3	2					2	3	2	4			3	2		4	4	2	3
36.09	3269	Pottery products necessary	3	4		3					2	3	2	4			3	3		4	4	3	3
36.10	3271	Concrete block and brick	1	1	4		1	1	1			4	2	1	1	2	2	3	1	4	3		
52.01	3581	Automatic merchandising machines		4	3		4	3	4	3				4		4		4	4	4		3	4
52.05	3589	Service industry machines necessary	4	4			3	3	3	4				4	3	4			3	3	3	3	
23.03	2531	Public building furniture			4	3	4	4	4	4	3	3		3				3	4				2
36.02	3251	Brick and structural clay tile	1			4	1	2	1			1	1	2	1		2	1	1				
20.02	2421	Sawmills and planing mills, general	4			2				4	1	2	3		3			4		4	4		1
51.01	3571	Computing and related machines	4		4	4	1		4														
23.07	2599	Furniture and fixtures necessary			3	2	3	4		3	3	2						4	3				1
46.02	3535	Conveyors and conveying equipment						4	4	4				4	4	3				4	4	4	
40.07	3444	Sheet metal work					2	3	4	4						4			4	4	4		
59.02	3715	Truck trailers		4			2	1	2	3						4			3			4	
53.08	3629	Electrical industrial apparatus necessary			4	4				3										4	4	3	4
63.01	3831	Optical instruments and lens			2	4					4	4	4									4	4
20.06	2432	Veneer and plywood				2					2	3	4					4					1
36.07	3262,3263	Food utensils, pottery	4			4							4	4			4	4					
46.03	3536	Hoists, cranes, and monorails				4		4		4	3	4											2
52.02	3582	Commercial laundry equipment					3	2							4	4				4	4		
27.01	281 (exc. 28195)	Industrial inorganic and organic chemicals				2	1				4							4					3
34.01	3131	Footwear cut stock								3	4	4										4	3
46.04	3537	Industrial trucks and trailers								4	4	4				4							3
48.06	3559	Special industry machinery necessary			4	4						4	4										4
55.02	3642	Lighting fixtures			4		4	4							4				4				
20.03	2426	Hardwood dimension and flooring				3						3	4										2
29.01	283	Drugs	3												4								
18.04	23 (exc. 239) 3992	Apparel made from purchased materials					1																
20.04	2429	Special product sawmills necessary																					4
23.06	2591	Venetian blinds and shades																					4
43.01	3511	Steam engines and turbines					4																
58.04	3694	Engine electrical equipment																					4

[a]1. Industry is among the top ten most desirable for a subregion.
2. Industry is among the top twenty most desirable for a subregion.
3. Industry is among the top thirty most desirable for a subregion.
4. Industry is among the top forty most desirable for a subregion.

Appendix A-8

National Job Outlook--Craft Occupations

Table 26. Rank order of numbers of annual job openings in craft occupations in the nation and how they are filled (projected to 1980)

Occupation	Annual openings	How filled	Reason for openings
Carpenters	39,300	Carpenters helpers, apprenticeship	Replacement
Electricians	21,200	Electricians helpers, trade schools, apprenticeship	Growth
Auto mechanics	19,600	Up through the ranks	Growth
Plumbers and pipefitters	19,500	Plumbers helpers, apprenticeship	Growth
Operating engineers	14,800	Up through the ranks	Growth
Machinists (and related)	14,200	Work experience, apprenticeship	Replacement
Aircraft mechanics	9,700	Mechanics helpers, school	Growth
Appliance repair	8,600	Repairmen helpers, work experience	Growth
Business machine service	8,500	Industry schools, work experience	Growth
Bricklayers	7,600	Bricklayer helpers, apprenticeship	Growth
Industrial machine repair	7,600	Work experience, apprenticeship	Growth
Stationery engineers	7,100	Tech. school, work experience	Replacement
Air conditioning and refrigeration	4,200	Mechanics helpers	Growth
Structural metal	3,900	Apprenticeship	Growth
Tool and die makers	3,800	Apprenticeship	Replacement
Auto body repair	3,500	Repairmen helpers, work experience	Growth
Composers-typesetters	3,200	Apprenticeship, work experience	Replacement
Television and radio service	3,000	School, military, work experience	Growth
Truck and bus mechanics	2,800	Work experience, school	Growth

Source: Carey (1971), p. 2-11.

Appendix A-9

National Job Outlook

People who are thinking about choosing or changing careers in the next few years will find timely and useful information in a report just issued by the Labor Department.

The 80-page booklet was put together mainly as a guide for companies, professional organizations, government planners and others involved in manpower-training programs for the 1970s.

But it gives a vast amount of detail on where jobs and job opportunities are likely to be. Parents who are trying to advise children on job prospects, for example, will find the report helpful.

Shortages and gluts. Among other things, the report, called "Occupational Manpower and Training Needs," estimates how many persons are being trained for key occupations--and whether there will be an excess or shortage of trained personnel in years ahead.

Also given are estimates on the number of workers who probably will be needed in 232 specific occupations by the year 1980.

For each position, there is a forecast of the annual average number of job openings in the '70s--as shown in the accompanying table [Table 27].

The Department was unable to get figures on current trainees for most of the occupations, but there are examples for key positions.

Some of the survey's findings:

•An oversupply of graduates is expected for teaching posts in elementary and secondary schools, based on current trends. About 4.1 million applicants could be available over the period--for some 2.4 million job openings.

•If medical schools are to keep up with the need for more physicians, the annual graduation classes must be more than doubled. The survey estimates that an average of about 20,000 additional doctors a year will be needed for the 1968-80 period. Around 8,000 are being trained yearly, it was reported. Approximately 2,000 immigrant doctors begin practice in the U.S. each year.

•An expected expansion of 2,300 jobs per year for architects is seen. The survey reports that architectural degrees granted will need to rise about 27 per cent over the 1969 level, but sees indications that this goal is being met.

•Training courses for auto mechanics will need to be enlarged to step up the number of graduates, the survey indicates. With annual openings for 17,300 mechanics estimated, existing programs trained some 12,000 in 1969.

•Law schools should be turning out about 20 per cent more lawyers each year than they did in 1968, to match 1980 requirements of 335,000. Because some graduates actually do not enter the profession, the study finds that about 20,000 law-school graduates per

year are needed to meet the yearly requirement of 14,500 new lawyers. A belief is stated that this output need probably is being met.

•An overabundance of economists is indicated, with 16,867 receiving bachelor's degrees each year--and some 2,200 positions due to open annually.

•About 800 positions will become available each year for historians. But the survey finds that nearly 41,000 bachelor's degrees are being issued yearly in this field.

The report concedes that its estimates are far from complete because of a lack of statistics on the actual output of educational and training programs for particular occupations.

Basic assumptions. As for estimates on future job openings in each occupation, the report points out that the projections are based on certain general assumptions on the future state of the economy. Thus, if the general situation changes, the figures could prove to be wrong.

The report, Labor Department bulletin 1701, is available for 75 cents a copy at regional offices of the Bureau of Labor Statistics. Checks should be made payable to the Superintendent of Documents.

Table 27. Report on which job fields are expanding, which are slowing down, and how many people are in training for key positions

	Latest Employment (1968 Estimate)	Annual Average of Job Openings in 1970s
BUSINESS ADMINISTRATION		
Accountants	500,000	33,000
Advertising workers	140,000	5,700
Marketing-research workers	20,000	2,700
Personal workers	110,000	6,900
Public-relations workers	100,000	8,800
CLERGYMEN		
Protestant clergymen	244,000	11,000
Rabbis	6,000	300
Roman Catholic priests	62,000	2,800
CONSERVATION		
Foresters	25,000	1,000
Forestry aides	13,000	900
Range managers	4,000	200
COUNSELING		
Employment counselors	5,300	700
Rehabilitation counselors	12,000	1,050
School counselors	54,000	3,800
ENGINEERS		
Aerospace	65,000	1,400
Agricultural	12,000	400
Ceramic	10,000	400
Chemical	50,000	1,600
Civil	180,000	11,500
Electrical	230,000	12,500
Industrial	120,000	7,200
Mechanical	215,000	8,600
Metallurgical	6,000	300
Mining	5,000	100
HEALTH SERVICE		
Physicians	295,000	20,000
Osteopaths	12,000	800
Dentists	100,000	4,900
Dental hygienists	16,000	2,400
Dental technicians	27,000	2,100
Registered nurses	660,000	65,000
Optometrists	17,000	800
Pharmacists	121,000	4,400
Podiatrists	8,500	200
Chiropractors	16,000	900
Occupational therapists	7,000	1,500
Physical therapists	14,000	2,800
Speech pathologists	18,000	2,300
Medical-lab workers	100,000	12,800
X-ray technologists	75,000	7,300
Medical librarians	12,000	1,400
Dietitians	30,000	2,700
Hospital administrators	15,000	900
Sanitarians	10,000	600
Veterinarians	24,000	1,400
MATHEMATICS		
Mathematicians	65,000	8,400
Statisticians	23,000	1,600
Actuaries	4,000	300
NATURAL SCIENCES		
Geologists	22,800	800
Geophysicists	6,800	300
Meteorologists	4,000	200
Oceanographers	5,200	500
LIFE SCIENCES		
Life scientists	170,000	15,200
Biochemists	11,000	700
PHYSICAL SCIENCES		
Chemists	130,000	12,800
Astronomers	1,400	100
PERFORMING ARTISTS		
Actors, actresses	14,000	900
Dancers	23,000	1,400
Musicians, music teachers	166,000	8,600
Singers, singing teachers	60,000	3,100
SOCIAL SCIENCES		
Anthropologists	3,000	200
Economists	31,000	2,200
Geographers	3,900	200
Historians	14,000	800
Political scientists	11,400	800
Sociologists	10,000	600
TEACHERS		
College teachers	286,000	17,000
Elementary-school teachers	1,230,000	99,000
Secondary-school teachers	940,000	101,000
TECHNICIANS		
Draftsmen	295,000	15,300
Engineering-science workers	620,000	31,000
WRITERS		
Newspaper reporters	37,000	1,800
Technical writers	30,000	1,300
OTHER PROFESSIONS		
Airline dispatchers	1,200	50
Air-traffic controllers	14,600	425
Architects	34,000	2,300
Broadcast technicians	20,000	400
College placement officers	2,500	200
Commercial artists	50,000	1,900
Flight engineers	7,500	225
Ground radio operators, teletypists	8,200	225
Home economists	100,000	7,800
Industrial designers	10,000	300
Interior decorators	15,000	700
Landscape architects	8,500	500
Lawyers	270,000	14,500
Librarians	106,000	8,200
Models	50,000	1,700
Photographers	60,000	2,200

Table 27. Continued

	Latest Employment (1968 Estimate)	Annual Average of Job Openings in 1970s
OTHER PROFESSIONS		
Pilots	52,000	1,800
Programmers	175,000	23,000
Psychologists	32,000	3,000
Radio, TV announcers	14,000	600
Recreation workers	40,000	4,100
Social workers	160,000	16,700
Surveyors	45,000	2,600
Systems analysts	15,000	27,000
Urban planners	7,000	800
MANAGERS		
Bank officers	125,000	9,900
Railroad conductors	38,000	2,500
Industrial-traffic managers	15,000	500
Hotels managers, assistants	150,00	9,500
Purchasing agents	140,000	6,700
CLERICAL		
Bank clerks	400,000	29,500
Bank tellers	230,000	20,000
Bookkeeping workers	1,200,000	78,000
Cashiers	730,000	69,000
Railroad clerks	93,000	2,700
Dental assistants	100,000	9,000
Computer operators	175,000	20,400
Hotel clerks	50,000	3,200
Library technicians	70,000	9,000
Mail carriers	246,000	12,200
Office-machine operators	325,000	25,000
Postal clerks	290,000	14,600
Receptionists	240,000	30,000
Shipping clerks	370,000	12,400
Railroad station agents	10,900	—225*
Stenographers and secretaries	2,650,000	237,000
Railroad telegraphers, telephoners, towermen	13,200	100
Telephone operators	400,000	28,000
Air-traffic agents, clerks	37,500	2,600
Typists	700,000	63,000
SALES		
Insurance agents, brokers	410,000	16,200
Manufacturers' salesmen	500,000	32,000
Real estate salesmen, brokers	225,000	14,200
Retail-trade salesworkers	2,800,000	150,000
Auto-parts countermen	65,000	2,500
Auto salesmen	120,000	4,400
Auto-service advisers	10,000	300
Securities salesmen	135,000	7,400
Wholesale-trade salesworkers	530,000	25,200
SERVICES		
Barbers	210,000	12,800
Hotel bellmen	30,000	1,100
Building custodians	1,100,000	80,000
Cooks, chefs	670,000	48,000
Cosmetologists	475,000	38,000
FBI agents	6,600	—
Fire fighters	180,000	7,700
Practical nurses	320,000	48,000
Hospital attendants	800,000	100,000
Hotel housekeepers	25,000	2,400
Police officers	285,000	15,000
Private-household workers	1,700.00	121,000
State police officers	35,000	2,800
Stewardesses	25,000	—
Waiters, waitresses	960,000	67,000
BUILDING TRADES		
Asbestos and insulating workers	22,000	800
Bricklayers	200,000	8,400
Carpenters	869,000	39,300
Cement masons	60,000	3,600
Electricians	190,000	10,500
Elevator builders	14,500	500
Floor-covering installers	37,000	1,700
Glaziers	9,000	500
Lathers	30,000	1,250
Operating engineers	285,000	14,800
Painters and paperhangers	430,000	18,200
Plasterers	40,000	700
Plumbers and pipe fitters	330,000	19,500
Roofers	55,000	3,000
Sheet-metal workers	50,000	2,500
Stonemasons	30,000	850
Ironworkers, machine movers	75,000	3,900
MACHINE OCCUPATIONS		
All-round machinists	400,000	12,600
Setup men	70,000	2,600
Tool and die makers	150,000	3,700
MECHANICS AND REPAIRMEN		
Air-conditioning, heating mechanics	100,000	5,000
Aircraft mechanics	135,000	9,700
Appliance servicemen	205,000	8,600
Auto-body repairmen	100,000	3,500
Auto mechanics	615,000	20,000
Bowling-pin machine mechanics	6,500	50
Business-machine servicemen	115,000	8,500
Electric-sign servicemen	6,100	300
Farm-equipment mechanics	40,000	1,100
Industrial-machinery repairmen	175,000	7,550
Instrument repairmen	85,000	4,600
Maintenance electricians	240,000	10,800
Millwrights	75,000	2,400
TV, radio-service technicians	125,000	3,000
Truck and bus mechanics	110,000	2,900
Vending-machine mechanics	16,000	650
Watch repairmen	20,000	1,400
PRINTING		
Bookbinders	30,000	400
Composing-room occupations	190,000	3,200
Electrotypers, sterotypers	8,000	—25*
Lithographic occupations	73,000	1,800
Photoengravers	18,000	300
Printing pressmen	90,000	2,850

Table 27. Continued

	Latest Employment (1968 Estimate)	Annual Average of Job Openings in 1970s
TELEPHONE INDUSTRY		
Central-office craftsmen	80,000	2,700
Central-office-equipment installers	22,000	400
Linemen, cable splicers	40,000	600
Telephone installers, repairmen	86,000	3,000
OTHER CRAFTS		
Auto upholsterers	8,000	350
Blacksmiths	15,000	500
Boilermakers	25,000	1,000
Dispensing opticians, optical mechanics	22,000	500
Foremen	1,444,000	56,200
Furniture upholsterers	32,000	800
Jewelers, jewelry repairmen	25,000	200
Locomotive engineers	35,000	1,350
Locomotive firemen (helpers)	19,000	−200*
Motion-picture projectionists	16,000	750
Shoe repairmen	30,000	1,500
Railroad-shop trades	87,000	2,250
Stationary engineers	26,000	7,050
DRIVING OCCUPATIONS		
Bus drivers, intercity	24,000	900
Bus drivers, local	65,000	500
Routemen	235,000	3,800
Taxi drivers	85,000	1,200
Truck drivers, local	1,200,000	37,000
Truck drivers, over-the-road	640,000	21,600
OTHER OPERATIVES		
Assemblers	785,000	26,000
Auto painters	30,000	1,200
Brakemen (railroad)	74,000	1,000
Electroplaters	13,000	600
Gas-station attendants	400,000	10,900
Inspectors (manufacturing)	585,000	19,200
Machine-tool operators	500,000	10,500
Meatcutters	200,000	4,500
Photo-lab occupations	30,000	1,600
Power-truck operators	163,000	4,100
Production painters	160,000	4,000
Signal-department workers (railroad)	12,100	− 450*
Stationary firemen (boiler)	73,000	− 600*
Waste-treatment-plant operators	23,500	2,500
Welders, arc cutters	480,000	23,000
LABORERS		
Bridge and building workers (railroad)	11,200	275
Track workers (railroad)	57,000	1,300
Construction laborers	750,000	29,000
FARM WORKERS	3,464,000	25,000

*Net loss in number of jobs.

APPENDIX B

SURVEYS OF COUNTY RESIDENTS

Appendix B-1

Survey of Student Interest Questionnaire

The Board of Education of San Juan School District is interested in expanding the vocational offerings in the high schools. We need to know the types of classes that students would be interested in taking if they were to be offered. Below are listed some of the courses which might be offered. Please choose three of the courses in which you are most interested and indicate your first (1), second (2), and third (3) choices. (Please mark only three.) Example: (1) Business Education, (2) Building Trades, (3) Drafting and Design.

___Agricultural (farming, ranching, equipment sales and repair, agri-business, mechanics)
___Auto Mechanics (repairing engines, transmissions, other mechical parts)
___Auto Body Repair (frame and body repair, painting)
___Building Trades (carpentry, plumbing, masonry, cabinetry)
___Business Education (typing, shorthand, bookkeeping, office machines)
___Commercial Art (lettering, design, painting, advertising)
___Cosmetology (hair waving, wigs, cutting, coloring, facials, barbering)
___Drafting and design (lettering, pictorial, machine and architectural drawing)
___Electricity, Electronics, and Communications (circuitry, meters, radio, T.V.)
___Graphic Arts (photography, silk screen, printing, newspaper type occupations)
___Health Occupations (nurses aides, laboratory technicians, pre-nurse, pre-doctor)
___Home Economics--Gainful (food preparation, catering, tailoring, design)
___Marketing and Distribution (retail-wholesale, buying, credit, display)
___Machine Shop (lathe, milling, other machine work)
___Welding (gas, electric, MIG)
___Other (please list other vocational classes you would be interested in)

_____

_____

If the above classes were offered, do you think you would register for the ones you have checked? ____Yes ____No

Your main interest in taking the above classes would probably be (check only one):
___Just for your own interest (elective credit for high school graduation)
___To pursue an occupation related to the class.
However, the other reason mentioned above would also be a concern.
____Yes ____No

What do you intend to do after you leave high school?

___Go to work	___Military service
___More education in a junior college	___Housewife
___More vocational education	___Other (please specify)
___More education in a university	_____

___Male	___Anglo	___Mexican-American	___Grade in school
___Female	___Indian	___Other	

Name_____

Appendix B-2

Tabular Results of Student Survey

Table 28. Indication of vocational programs desired by students in the seventh, eighth, and ninth grades[a]

Type of class	Male choice		Male total	Female choice		Female total
	Anglo	Indian		Anglo	Indian	
Agriculture	51	44	95	6	6	12
Auto mechanic	128	148	276	15	7	22
Auto body repair	38	79	117	4	9	13
Building trades	47	8	55	7	4	11
Business education	17	9	26	85	126	211
Commercial art	18	15	33	44	38	82
Cosmetology	1	2	3	131	108	239
Drafting & design	42	29	71	9	10	19
Electronics	57	41	98	3	3	6
Graphic art	10	8	18	11	19	30
Health occupations	6	3	9	56	65	121
Home economics	1		1	150	100	250
Marketing and distribution	8	5	13	6	13	19
Machine shop	17	40	57	1	3	4
Welding	54	50	104		6	6
Other	3	1	4	2		2

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

Table 29. Indication of vocational programs desired by students in the tenth grade[a]

Type of class	Male choice		Male total	Female choice		Female total
	Anglo	Indian		Anglo	Indian	
Agriculture	14	1	15			
Auto mechanics	28	32	60			
Auto body repair	10	14	24	2		2
Building trades	24	8	32	1	2	3
Business education	4	3	7	18	40	58
Commercial art	7	3	10	19	6	25
Cosmetology				22	15	37
Drafting & design	7	2	9		2	2
Electronics	11	11	22			
Graphic art		1	1	7	3	10
Health occupations	5		5	24	27	51
Home economics				15	23	38
Marketing and distribution	3		3		2	2
Machine shop	1	6	7			
Welding	11	3	14			
Other	7		7			

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

Table 30. Indication of vocational programs desired by students in the eleventh grade[a]

Type of class	Male choice		Male total	Female choice		Female total
	Anglo	Indian		Anglo	Indian	
Agriculture	12	3	15	3		3
Auto mechanics	40	17	57	3		3
Auto body repair	11	8	19			
Building trades	19	4	23			
Business education	4	1	5	29	35	64
Commercial art	7		7	16	1	17
Cosmetology				40	25	65
Drafting & design	6	2	8	6		6
Electronics	15		15		1	1
Graphic art				3	3	6
Health occupations	3		3	42	16	58
Home economics				39	23	62
Marketing and distribution	3		3	4	1	8
Machine shop	7		7			
Welding	11	4	15			
Other	6		6	19	3	22

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

Table 31. Indication of vocational programs desired by students in the twelfth grade[a]

Type of class	Male choice		Male total	Female choice		Female total
	Anglo	Indian		Anglo	Indian	
Agriculture	15	3	18			
Auto mechanics	26	18	44		1	1
Auto body repair	21	13	34			
Building trades	2		2			
Business education		1	1	28	17	45
Commercial art	6	7	13	5		5
Cosmetology				26	14	40
Drafting & design	8		8			
Electronics	12	5	17		2	2
Graphic art		1	1	5	4	9
Health occupations	6		6	24	11	35
Home economics				41	14	55
Marketing and distribution	7	2	9	5		5
Machine shop	1	2	3			
Welding	6	8	14			

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

Table 32. Indication of vocational programs desired by Anglo students at San Juan High School[a]

Type of class	Male students					Female students				
	Grade				total	Grade				total
	7-9	10	11	12		7-9	10	11	12	
Agriculture	51	14	12	15	92	6		3		9
Auto mechanics	128	28	40	26	222	15		3		18
Auto body repair	38	10	11	21	80	4	2			6
Building trades	47	24	19	2	92	7	1			10
Business education	17	4	4		25	85	18	29	28	160
Commercial art	18	7	7	6	38	44	19	16	5	84
Cosmetology	1				1	131	22	40	26	219
Drafting & design	42	7	6	8	63	9		6		15
Electronics	57	11	15	12	95	3				3
Graphic arts	10				10	11	7	3	5	26
Health occupations	6	5	3	6	20	56	24	42	24	146
Home economics	1				1	150	15	39	41	245
Marketing and distribution	8	3	3	7	21	6		4	5	15
Machine shop	17	1	7	1	26	1				1
Welding	54	11	11	6	82					
Other	3	7	6		16	2		19		21

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

Table 33. Indication of vocational programs desired by Indian students at San Juan High School[a]

Type of class	Male students					Female students				
	Grade				total	Grade				total
	7-9	10	11	12		7-9	10	11	12	
Agriculture	44	1	3	3	51	6				6
Auto mechanics	148	32	17	18	215	7				8
Auto body repair	79	14	8	13	114	9				9
Building trades	8	8	4		20	4	2			6
Business education	9	3	1	1	14	126	40	35	17	218
Commercial art	15	3		7	25	38	6	1		45
Cosmetology	2				2	108	15	25	14	162
Drafting & design	29	2	2		33	10	2			12
Electronics	41	11		5	57	3		1	2	6
Graphic arts	8	1		1	10	19	3	3	4	29
Health occupations	3				3	65	27	16	11	119
Home economics						100	23	23	14	160
Marketing and distribution	5			2	7	13	2	1		16
Machine shop	40	6		2	48	3				3
Welding	50	3	4	8	65	6				6
Other	1				1			3		3

[a]Numbers based on three points for a first choice, two points for a second choice, and one point for a third choice.

Appendix B-3

District Staff Questionnaire

We are interested in finding from the teaching and administrative staff of the district those vocational programs which they would suggest as most practical and beneficial for the students and adults of the area.

Below are listed some of the courses which might be offered. Please put a 1 (one) by each course which in your opinion should definitely be offered and a 2 (two) by each course which should be included if possible.

___Agricultural (farming, ranching, equipment sales and repair, agri-business, mechanics)

___Auto Mechanics (repairing engines, transmissions, other mechanical parts)

___Auto Body Repair (frame and body repair, painting)

___Building Trades (carpentry, plumbing, masonry, cabinetry)

___Business Education (typing, shorthand, bookkeeping, machines)

___Commercial Art (lettering, design, painting, advertising)

___Cosmetology (hair waving, wigs, cutting, coloring, facials)

___Drafting and Design (lettering, pictorial, machine and architectural drawing)

___Electricity, Electronics, and Communications (circuitry, meters, radio, T.V.)

___Graphic Arts (photography, silk screen, printing, composition, newspaper type occupations)

___Health Occupations (nurses aides, laboratory technicians, food services)

___Home Economics--Gainful (food preparation, catering, tailoring, food services)

___Marketing and Distribution (retail, wholesale, buying, credit)

___Machine Shop (lathe, milling, other machine work)

___Welding (gas, electric, MIG)

___Other (please list other courses which in your opinion could be offered and rate them 1 or 2 as above

_____

_____

No signature required but you may sign if you desire

_____

_____(Position)

Other suggestions you may have about vocational education:

Appendix B-4

Suggestions of District Staff Concerning Vocational Programs

Monticello area

There should be seminars and other meetings to inform school personnel and citizens about the need for vocational education.

There should be a vocational diploma separate from the regular high school diploma.

It would be nice to offer all the programs but it probably is not possible.

It would be good to offer some of the courses, such as Health Occupations, as short-term classes rather than continuous classes.

Blanding area

Classes should be given in outlying areas.

Classes which will lead to employment in or near the area are especially important. There should be coordination with businesses in the area in setting up programs.

There should be special adult English and Math classes for Navajos.

There definitely needs to be articulation between high school and post-high school institutions so students can receive advanced placement for high school programs.

Commercial Art and Arts and Crafts would be particularly beneficial to the Navajos.

There should be no discrimination--Anglos should have the same opportunities as the colored races. (Apparently there have been some instances of "reverse discrimination" in some of the programs--this was suggested by three persons.)

Appendix B-5

Letter and Employer Questionnaire

September 1971

To Alumni, Employers, Teachers,

The Board of Education of San Juan School District is interested in expanding the vocational offerings at the high schools. We are seeking information from students, teachers, parents, recent alumni, and employers in trying to determine the types of vocational programs that should be offered.

Would you please fill out the attached questionnaire. All information is strictly confidential and the questionnaires are coded for follow-up purposes only.

We appreciate your interest in helping to improve the educational programs for the students of the county. Please return the questionnaire in the enclosed envelope. This will take approximately 10 minutes of your time. No signatures are required but you may sign if you desire.

Sincerely,

Loren Martin

Loren Martin
Vocational Planning Consultant

EMPLOYER QUESTIONNAIRE

We are interested in knowing the types of vocational programs you think should be offered to high school students and adults. Please answer the following questions:

1). Type of business _____

2). Number of people employed _____

3). Do you anticipate your business:

_____ growing in numbers of employees
_____ remaining about the same
_____ decreasing in numbers of employees

4). What 3 basic manipulative skills would you suggest as most important in a new employee in your business? (Example: Typing, shorthand, clerical, machine operation (type of machine), mathematical computation, etc.)

_____
_____
_____

5). What 3 personality traits are most important in your business? (Example: Honesty, promptness, good attitude, etc.)

_____
_____
_____

6). Would you rate the manipulative skills you suggested as more important, equal, or less important than the personality traits?

_____ more important
_____ equal
_____ less important

Comment: _____
_____

7). In what ways could the school be beneficial in the training or upgrading of your present employees?

_____
_____

8). Would you hire a recent high school graduate who had the basic manipulative skills and personality traits to serve your business?

_____ Yes
_____ Probably not
_____ Undecided

Comment: _____
_____

9). Would you hire a high school dropout who had the basic manipulative skills and personality traits to serve your business?

_____ Yes
_____ Probably not
_____ Undecided

Comment: _____
_____

10). Which of the following types of vocational classes do you think would be most beneficial to the students and businesses in the area?

____Agricultural
____Auto Mechanics
____Auto Body Repair
____Building Trades
____Business Education
____Commercial Art
____Cosmetology
____Drafting and Design
____Electricity, Electronics, and Communications
____Graphic Arts
____Health Occupations
____Home Economics--Gainful
____Marketing and Distribution
____Machine Shop
____Welding
____Other

---

11). Which 2 or 3 of the above programs would be most beneficial to your business?

_____
_____
_____

12). Would you be interested in participating with the schools in a cooperative educational program where the student learns some basic skills and then is released for 1, 2, or 3 periods each day to work in your place of business? The student would also have a special class in school which provides further training related to his job.

____Yes
____No
____Undecided

If "Yes," for which types of jobs could you provide a work station? (Example: secretarial, machinist.)

13). Other suggestions you would make for vocational education in the area.

Appendix B-6

Comments by Employers [1]

Manipulative skills suggested by employers in the Blanding area

The following manipulative skills were suggested: typing (20); business machines (17); clerical (13); bookkeeping (4); shorthand (3); mathematical competency (16); heavy equipment operation and maintenance (5); mechanics (4); auto tune-up (2); front end alignment; tire changer; carpentry (2); general handy man (2); welding, metal fabrication; inventive skills; plumbing equipment operation; sales clerk; glazier; commercial laundry maintenance; reasoning ability; nursing; cooking; housekeeping; horticulture; stocking shelves; dexterity.

Personality traits suggested by employers in the Blanding area

The following personality traits were suggested: honesty (49), good attitude (27), good personality (21), dependability (19), promptness (16), willingness to work (6), personal grooming (4), neatness (3), ambition (3), loyalty to employer (3), aggressiveness (3), ability to communicate (2), creativity (2), well informed about area, willing to learn, competent, composure, quick reflexes, efficiency, care in handling valuable objects, follow-through, reliability, courteous, patience.

---

[1] Number of responses in parentheses if more than one.

Comments by employers as to respective importance of personality traits and manipulative skills

Obviously the right attitude and willingness to learn are essential or the manipulative skills cannot be fully utilized. (3)

Skills can be learned after employment but personality traits are harder to change. (4)

Personality is most important in making customers welcome. (3)

Without a good attitude, skills are useless. (2)

Given the proper desire, all obstacles fall.

One must know how to do something but also must meet and greet the public.

Accuracy overrides manipulative skills and speed. To do the thing right the first time is most important. (3)

A person must have the skills to do the job they are hired for but must be able to work with people also. (2)

Personality traits are of utmost importance. (4)

Ability to do work accurately and promptly is essential.

People working in public places should be efficient and personable. (2)

Public appearance is most important, manipulative skills are behind the scenes.

Attitude and willingness to accept instructions are most important.

Possible types of training stations for cooperative programs in the Blanding area

The following types of training stations were suggested: secretary (7), auto mechanics (2), building trades (2), electronics (2), refrigeration--air conditioning, service station, radio announcer, motel maid, nursing, waitress, cook, floral arranging, horticulture, small engine mechanics, grocery checker, police training.

Possible types of training stations for cooperative programs in the Monticello area

The following types of training stations were suggested: secretary (15), auto mechanics (3), clerical (2), meat cutting (2), machine shop, welding, grocery store (variety of jobs), short order cook, nursing, cosmetics (drug store), waitress, floral arranging, data processing, drafting, dental assistant, building trades.

Suggestions from employers concerning vocational education in the area

Offer training for tourist-oriented businesses--knowing the area and how to "sell" it, how to meet and serve travelers (service stations, motels, restaurants, cooks, waitresses, tour guides, marina workers, etc.). (3)

Offer classes in developing good attitudes, work habits, responsibility, etc.

What we need is a whole new concept of vocational education such as two days in school, three days on the job, or something similar.

Keep the graduates in the area by encouraging business and industry to move into the area.

There should be a follow-up program to get people in jobs after they are trained.

Because of the remoteness of our area, there should be classes of a more technical nature for adults, similar to Sevier Valley Tech or Utah Technical Colleges.

Vocational schools are way overdue for our area!

We urge this program. A college graduate or prep is of no use to us.

The public in general needs to know more about the American economic system, the causes of inflation, etc.

Because of limited industry, there is little demand for vocational skills in our immediate area. Skills should be taught which are not offered at every other school in the state such as baking and confectionary, meat cutting, etc.

Training is needed for making tourist souvenirs.

Most people need vocational training, either because they can't go to college or to help them get a job while in college.

Labor unions should be involved in program development.

Make information more available on schools which offer various types of post-high training.

Students need information on making job applications, social security, withholdings, etc.

Make students aware that missing work is different than missing school.

There is a definite need of vocational education among the Indians and more high school graduates need vocational training.

Work placement should be part of the program.

The school needs to work closely with area employers so their needs are met.

Girls need more training in home management. There is more to it than preparing meals, washing, ironing, cleaning, and sewing. They need to know how to buy and prepare all types of consumer items and how to use leftovers and scraps.

Present department could produce better. The present investment is not turning out results.

Drop athletics and substitute vocational programs for boys. Encourage girls to take traditional boys' classes (industrial arts) and vice versa.

Suggestions from employers concerning cooperative education

If teaching was sufficiently good, students could exchange ideas with present employees to the benefit of both.

Appendix B-7

Letter and Adult Questionnaire

September 1971

Dear Parents:

The Board of Education of San Juan School District is interested in expanding the vocational offerings at the high schools. We are seeking information from students, teachers, parents, recent alumni, and employers in trying to determine the types of vocational programs that should be offered.

We are sending a questionnaire home with all elementary students for their parents to fill out in regard to adult education programs.

If both mother and father desire adult programs, please fill out one form each. If you have more than one child who brought home these forms please return only one set. All information is strictly confidential.

Thank you for your time and interest. You may sign the questionnaire if you desire; however, no signature is required.

Sincerely,

Loren Martin

Loren Martin
Vocational Planning Consultant

SURVEY OF ADULT INTEREST IN VOCATIONAL CLASSES

Part of the purpose of the Vocational Center will be to train for new jobs and to offer refresher courses for adults. Below are listed some of the courses which might be offered. Please choose 2 of the subjects in which you are most interested and indicate your first and second choice. (Example: 1). Building Trades, 2). Business Education.)

____Agricultural (farming, ranching, equipment sales and repair, agri-business, mechanics)

____Auto Mechanics (repairing engines, transmissions, other mechanical parts)

____Auto Body Repair (frame and body repair, painting)

____Building Trades (carpentry, plumbing, masonry, cabinetry)

____Business Education (typing, shorthand, bookkeeping, machines)

____Commercial Art (lettering, design, painting, advertising)

____Cosmetology (hair waving, wigs, cutting, coloring, facials)

____Drafting and Design (lettering, pictorial, machine and architectural drawing)

____Electricity, Electronics, and Communications (circuitry, meters, radio, T.V.)

____Graphic Arts (photography, silk screen, printing, composition)

____Health Occupations (nurses aides, laboratory technicians, food services)

____Home Economics--Gainful (food preparation, catering, tailoring, design)

____Marketing and Distribution (retail, wholesale, buying, credit)

____Machine Shop (lathe, milling, other machine work)

____Welding (gas, electric, MIG)

____Other (please list other classes you would be interested in)

_____

_____

____Male ____Female ____Age ____Anglo ____Mexican-American

____Indian ____Other

What other suggestions would you make for vocational education in this area:

Please write the names of neighbors who do not have children in elementary school who should be contacted through other means.

_____ _____

_____ _____

Appendix B-8

Comments by Adults

I would like to see any of the health occupations where we are so far from training centers and a large part of our nurse's aid.

Plan to train for jobs which are regularly available such as waitress, motel maids, clerks, or cashiers in local stores, service station attendant, house keeper and so on so that students will be able to use this training to support themselves while attempting to get summer or part time jobs while gaining further training.

Encourage the welfare recipient to enroll to learn a trade so as to be self supporting.

Interested in almost any course if college credit could be obtained (given in La Sal).

Provision for continuing education to achieve high school diploma.

Don't build all the facilities in Blanding. Monticello's vocational program needs to be expanded also.

Don't understand English well enough to read, would love to take a class in English and Reading.

Appendix B-9

Indian Adult Questionnaire

In connection with planning the new vocational programs, the School District is interested in knowing about classes which would be particularly beneficial to Indian Adults. We would like to have your opinion on which classes should be offered. Please put a check mark (✓) by those classes which you think should be available for adults.

____Agriculture (farming, ranching, equipment mechanics)

____Auto Mechanics (repairing engines, transmissions, other mechanical parts)

____Auto Body Repair (frame and body repair, painting)

____Building Trades (carpentry, plumbing, masonry, cabinetry)

____Business Education (typing, shorthand, bookkeeping, office machines)

____Commercial Art (lettering, design, painting, advertising)

____Cosmetology (hair waving, wigs, cutting, coloring, facials)

____Drafting and Design (lettering, pictorial, machine and architectural drawing)

____Electricity, Electronics, and Communications (circuitry, meters, radio, T.V.)

____Graphic Arts (photography, silk screen, composition, newspaper-type occupations)

____Health Occupations (nurses aides, laboratory technicians, nursing, etc.)

____Home Economics--Gainful (food preparation, catering, tailoring, design)

____Marketing and Distribution (retail-wholesale buying, credit)

____Machine Shop (lathe, milling machine, other machine work)

____Welding (gas, electric, MIG)

____Others you think should be offered _____ _____

There is a possibility that some of the programs can be put in mobile trailers to be taken to various areas of the Reservation. Which programs would you suggest as being most beneficial in a mobile unit?

_____ _____

_____ _____

Various suggestions have been made concerning programs of Indian Arts and Crafts for both adults and high school students. What arts and crafts classes would you suggest to be included in the new vocational building or in mobile units?

New Building	Mobile Units
_____	_____
_____	_____
_____	_____

Appendix B-10

Alumni Questionnaire

We are interested in knowing what you are now doing and which vocational classes you think would have been most beneficial to you if you would have been given the opportunity to take them in high school.

Below are listed some of the courses which might be offered. Please choose only three of the subjects which you think would have been beneficial and indicate your first, second, and third choice. Example: (1) Building Trades, (2) Welding, (3) Business Education.

____Agriculture (farming, ranching, equipment mechanics)

____Auto Mechanics (repairing engines, transmissions, other mechanical parts)

____Auto Body Repair (frame and body repair, painting)

____Building Trades (carpentry, plumbing, masonry, cabinetry)

____Business Education (typing, shorthand, bookkeeping, office machines)

____Commercial Art (lettering, design, painting, advertising)

____Cosmetology (hair waving, wigs, cutting, coloring, facials)

____Drafting and Design (lettering, pictorial, machine and architectural drawing)

____Electricity, Electronics, and Communications (circuitry, meters, radio, T.V.)

____Graphic Arts (photography, silk screen, composition, newspaper-type occupations)

____Health Occupations (nurses aides, laboratory technicians, nursing, etc.

____Home Economics--Gainful (food preparation, catering, tailoring, design)

____Marketing and Distribution (retail-wholesale buying, credit)

____Machine Shop (lathe, milling machine, other machine work)

____Welding (gas, electric, MIG)

____Other (please list other classes you think would have been beneficial)

_____ _____

_____ _____

On the questions following, please put a check (✓) by all answers that apply and fill other blanks as indicated.

____I probably would not have taken any vocational classes in high school

____Male
____Female

____Mexican-American
____Anglo
____Indian
____Other

I am presently:

____Employed (type of job)_____

____Planning to attend (or already attending) a post-high school institution.

Name of institution_____ Major_____

____In military service.

____Housewife.

____Unemployed (but have had the following jobs)_____

_____

_____

____Other (please specify)_____

In which cities or communities have you worked since leaving high school? Approximately how long did you work there and what type of job were you doing?

City or community	Length of time	Type of work
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Did you take any vocational classes in high school?

____Yes Types of classes_____ _____

_____ _____

____No

What is your present annual income (approximately)? _____

Do you think a vocational class in high school related to your present or past job would have substantially increased your income?

____Yes

____No

If vocational classes were offered to those already out of high school, would you enroll?

____Yes Types of classes desired_____

_____

____No _____

_____

Appendix B-11

Data from Alumni

San Juan High School girls

Five of the young ladies said that they probably would not have taken any vocational classes in high school.

In response to being asked what they are presently doing, they indicated the following: employed, 9; attending school, 22; housewife, 10; unemployed, 3.

Of those who are employed, four are secretaries, three are cashier/clerks, and two are waitresses.

The 22 in school are attending the following institutions: BYU, 4; Weber, 3; U of U, 2; USU, 2; SUSC, 1; business college, 2; junior colleges (in-state), 3; junior colleges (out-of-state), 5.

They are majoring in the following programs: health occupations, 5; education, 5; secretarial occupations, 5; cosmetology, 2; fashion merchandising, 1; speech therapy; general, 1; undecided, 2.

Other former students who were not presently working or attending school indicated that they have had the following jobs: secretarial, 4; cashier/clerk, 3; waitress, 4.

In response to the question of where they had held jobs, how long they had worked, and the type of work they were doing, they indicated: Blanding area, 17; Monticello area, 3; other San Juan area, 2; Wasatch Front, 8; other Utah area, 3; out-of-state, 11.

Seventy-four percent of those who had worked in the immediate vicinity held a job for six months or less, while only 10 percent had worked more than one year. They had been engaged in the following

occupations: secretarial, 5; waitress, 5; cashier/clerk, 5; teacher aide, 3; recreation, 2; cook, 2.

Of those who had left the area for employment, 9 had worked for 3 months or less, 4 had worked from 3 to 12 months, and 4 had worked more than one year. Their jobs included: secretarial, 10; waitress, 6; motel manager, 3; health occupation, 2; ranch work, 1; college library, 1; cannery, 1; baby sitting, 1.

Thirty-eight percent indicated that they had taken vocational classes in high school, with 5 indicating home economics classes and 15 mentioning business classes.

Seventy-two percent said that they thought a vocational class would have substantially increased their income and 78 percent would enroll in vocational classes if they were available. They indicated an interest in the following classes: health occupations, 10; home economics, 10; business education, 8; cosmetology, 6; commercial art, 3.

San Juan High School boys

Of those who answered the question concerning current endeavors, 10 were employed, 16 were enrolled in school, 2 were on missions, and 3 were in military service. The 10 who were employed had the following jobs: building construction/maintenance, 5; mechanics, 2; road construction, 1; logging, 1; mining, 1.

Those attending school were enrolled in the following institutions: BYU, 4; U of U, 4; Weber, 2; USU, 1; Utah Technical, 2; junior college (in-state), 1; junior college (out-of-state), 2.

They were majoring in: health occupations, 3; education, 3; mechanics, 2; electronics, 2; business management, 1; accounting, 1; industrial technology, 1; liberal arts, 1; undecided, 2.

Sixteen of the young men had worked in the Blanding area previously, with 9 of them working for 3 months or less. Only two had worked at one job for more than a year. They had been employed in the following jobs: building trades, 10; service station, 2; mining, 2; ranching, 2; teacher's aide, 1; logging, 1; recreation, 1; common labor, 1.

Seven of the young men had worked in other areas of the state. Three had gone to the Wasatch Front area and five had worked at jobs out of state. Four of them had worked at one job for six months or less and only one had worked at one job for a year or more. They had worked in the following jobs: building construction, 3; mechanics, 2; oil well, 2; tree service, 1; logging, 1; cashier/clerk, 1.

Fifty-seven percent of the young men said they had taken vocational classes in high school. They mentioned the following classes: welding, 7; drafting, 6; woodwork, 4; shop, 4; vocational agriculture, 2; leatherwork, 1.

Fifty-seven percent also indicated that a vocational class in high school would probably have substantially increased their income.

Fifty-three percent said they would enroll in vocational classes offered to those already out of high school and suggested the following classes: building trades, 6; auto mechanics, 5; electronics, 4; welding, 4; drafting, 2; machine shop, 1; arts and crafts, 1; health occupations, 1.

Appendix B-12

Letter and College Student Questionnaire

January 1972

Dear Student:

San Juan School District (San Juan County, Utah) is planning to build an Area Vocational Center in Blanding, Utah, to serve high school students and adults. We do not feel that we have had sufficient information from the Indian population to determine which vocational programs will be most beneficial to the Indian people. Therefore, we are contacting the Indian students at the colleges and universities to ask their opinion on which programs should be offered.

Would you please fill out this questionnaire so that we may have your opinion.

Thank you very much for your help.

Sincerely,

Loren Martin

Loren Martin
Vocational Planning Consultant
San Juan School District

We are interested in knowing which vocational classes you think would be most beneficial to high school students and also adults.

Below are listed some of the courses which might be offered. Please choose three of the subjects you think would be most useful and indicate your first, second, and third choice. Example: (1) Building Trades, (2) Welding, (3) Business Education.

___Agricultural (farming, ranching, equipment sales and repair, agri-business, mechanics)
___Auto Mechanics (repairing engines, transmissions, other mechanical parts)
___Auto Body Repair (frame and body repair, painting)
___Building Trades (carpentry, plumbing, masonry, cabinetry)
___Business Education (typing, shorthand, bookkeeping, office machines)
___Commercial Art (lettering, design, painting, advertising)
___Cosmetology (hair waving, wigs, cutting, coloring, facials)
___Drafting and Design (lettering, pictorial, machine and architectural drawing)
___Electricity, Electronics, and Communications (circuitry, meters, radio, T.V.)
___Graphic Arts (photography, silk screens, printing, newspaper-type occupations)
___Health Occupations (nurses aides, laboratory technicians, food services)
___Home Economics--Gainful (food preparation, catering, tailoring, design)
___Marketing and Distribution (retail, wholesale, buying, credit)
___Machine Shop (lathe, milling, other machine work)
___Welding (gas, electric, MIG)
___Other (please list other classes you think should be offered)

_____

_____

Do you think a program of Indian Arts and Crafts should be offered?

___Yes If "yes" check all that should be offered.

___No _____Silversmith _____Pottery
_____Rug Weaving _____Basket Weaving
_____Leather Work _____Other (specify)_____

Did you take any vocational classes in high school?

___Yes If "yes" which classes did you take?

_____

_____

___No If "no" do you wish you had taken vocational classes?

___Yes Type of classes

_____

_____

___No _____

Write on back any other suggestions you might have concerning vocational education.

Appendix B-13

Comments by College Students

The students were asked for other suggestions concerning vocational education. These suggestions included:

It is a good idea to build a vocational school which is closer to the Indians (2).

I agree with vocational programs for the Indians. These may also benefit us in further education.

Make your vocational classes more interesting--mine were really boring.

Vocational training is widely needed on the reservation. All types of skilled workers are needed. It is a big move to offer vocational training.

I sincerely suggest that you think of younger elementary and junior high students. They should have an opportunity to make things in ceramics, wood, painting, etc.

Most of the programs listed are interrelated. It is wise to help the student correlate the ideas.

Eliminate BIA concentrated schools.

I would like to see more of the younger Indians learning the traditional arts and crafts. They are beginning to die out with fewer and fewer younger generations learning them. There is a good demand for Indian arts and crafts.

Such a program should include information related on how to meet people. Also in planning their future within their abilities, but with higher hopes and aspirations than just a farmer. Other classes geared toward the home and family relationships.

VITA

Loren Martin

Candidate for the Degree of

Doctor of Education

Dissertation: An Analysis of Area Interests and Employment Projections with a Recommended Program of Study and Educational Specifications for an Area Vocational Center for San Juan County, Utah

Major Field: Industrial Education

Biographical Information:

Personal Data: Born at Jackson, Wyoming, January 6, 1936, son of Warren R. and Iris Imeson Martin; married Myrtle Jackson August 24, 1962; five children--Lori, Loren (deceased), Kenneth, Keith, and David.

Education: Attended elementary school at Boulder, Wyoming; graduated from Pinedale High School in 1954; received the Bachelor of Science degree from Brigham Young University in 1965, with a major in industrial education; received the Master of Science degree from Stout State University in 1966, with a major in industrial education; completed requirements for the Doctor of Education degree, majoring in industrial education, at Utah State University in 1972.

Professional Experience: NDEA Fellowship, Utah State University, 1970-72; developed materials on vocational advisory committees for State Department of Education, Utah, 1971; instructor in industrial education, Wasatch High School, Heber City, Utah, 1966-70; teaching assistantship, Stout State University, 1965-66; laboratory assistantship, Brigham Young University, 1964-65; hold trade and industrial certificate in carpentry; member: Phi Delta Kappa, Phi Kappa Phi.