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ABSTRACT

Occupational versatility is an innovative approach to the teaching of industrial arts which began in the fall of 1969 in three pilot schools, two junior high (Grades 7, 8, and 9) and one middle (Grades 6, 7, and 8). The major components are a multi-experience general shop facility, team teaching, student management, a self-instructional system for learning, ungraded heterogeneous grouping, career guidance opportunities, and a non-graded approach to reporting student performance and granting course credit. Students who elect to participate in the program select their own work areas, manage their own shop activities, keep their own records, instruct themselves in procedures and equipment usage, and judge their own performance and abilities. The instructor provides guidance but the student is the director of his experiences. A notebook system is an essential feature of the program, providing operational guidance for students and also forms on which students maintain their own attendance and performance records. Evaluations of the 1970-71 and 1971-72 program operational years are included. Reactions of teachers, parents, and students have been positive and the program will be continued and extended to other schools and districts in the following school year. Shop area layouts and forms used in the program are appended. (MF)

Occupational Versatility

Final Report

for the

3-year period,

July, 1969 through June, 1972

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I. Narrative Report

SUMMARY

Occupational Versatility is an innovative approach toward the teaching of industrial arts. This approach is designed around the learning methods which students can employ in an industrial arts facility, and the focal point is the individual student.

Occupational Versatility developed, as do many innovative projects, from the frustrations which teachers were experiencing within the existing educational system. These teachers did not see the conventional methods of industrial arts instruction as providing adequately for the needs of the students. Emerging from these perceptions was the suggestion that if attention were to be focused on both the learner and the ways in which he learned, it might be possible to find better ways to teach. The major objective then, as Occupational Versatility commenced, was to help students learn in the industrial arts environment --- and not to teach industrial arts to students.

With this focus as a design base, the next step was to identify "what should teachers know about the learners when they enter the program?" and "what changes in behavior are desired upon exit?" During the planning period, these exit behaviors --- attitudes and abilities --- were determined and the program was designed to facilitate their occurrence. The personalization of the program, with each student entering the shop as an individual and setting his own goals and working toward them at his own pace, was determined as the key to meeting the students' needs.

The student who elects to participate in the Occupational Versatility industrial arts program is encouraged to:

1. Select the area in which he wants to work, elect the project he wishes to produce, make the project and evaluate the results.

2. Manage his activities in the shop, which includes being responsible for attendance and time utilization, material purchases, project planning, performance records, and facility maintenance.

3. Instruct himself in planning procedures, material changing processes and tool and equipment usage.

4. Investigate career opportunities and make judgments about these with consideration to his own abilities and interests.

These experiences occur under the guidance of an instructor - but not by the direction of an instructor. The instructor is the facilitator of the learning, while the student is the director. The instructor is a resource for the student to call upon for assistance and counseling; the student is the manager of his activities. These roles are different than they were before, but are considered to be essential to facilitate the desired student growth and development.

In order to permit students to work independently on their own interests, several major methodological changes were necessitated. The separate unit shops for wood, metal, and drawing were remodeled into a large, single-room general shop. Three teachers were teamed together as instructors in Chinook and Keithley Junior High Schools, and two in McKnight Middle School. Activity areas were expanded so the program could offer the students experiences in woods; plastics; power; electricity and electronics; bench, sheet, art and machine metals; forge and foundry; arc and gas welding; graphics; planning and drafting; general industries including construction, manufacturing, masonry, glass, tile, etc.; crafts; and career guidance.

Each of the areas is self-contained and is organized with open storage, making all tools, supplies, instructional materials and project samples readily available to the students. Planning areas and necessary power equipment are easily accessible. The areas are color coded for easy maintenance, and all tools and materials are labeled to make them readily identifiable. Machines are also color-coded, to national standards, to facilitate improved operational learning.

A notebook was devised which enables the student to manage his own activities. When the student enters the shop he picks out his notebook, which is numbered and color-coded to the period in which he is enrolled. The office girl takes attendance by checking the notebook bookcase; notebooks remaining in the bookcase indicate the student is absent that period. Within the notebook, the student maintains his attendance record, materials purchased record, performance record and power equipment usage record on the forms provided. He also keeps all his plans and procedure records in the notebook.

The student takes the notebook to his work area, which insures that it is always near at hand for his use and for student-teacher conferences. This is an essential feature of the program in facilitating student-teacher relationships. The notebook system serves as a catalyst between the student and the industrial arts facility, and has helped to provide much of the guidance necessary for independent student action.

The learning system is of a self-instructional nature. The student is charged with the responsibility for instructing himself in any process, procedure, or tool or machine operation he needs or desires to learn. He may call upon a wide variety of information resources to assist him which include loop films, cassette tapes, film strips, charts, instruction sheets, and other students. The teacher's role, as an information resource, is to be the last resort if all else fails. The teacher is also responsible for checking the efficiency of students' self-instruction, such as on power machines, to see if learning is thorough and accurate. Finally, he is also an observer, who may offer suggestions as needed or requested. This new role required considerable training experiences to prepare the teachers to operate in the Occupational Versatility industrial arts environment.

Students from all grade levels (7, 8 & 9 in junior high schools, or 6, 7 & 8 in middle schools), boys and girls, beginners and industrial arts veterans, are mixed together to form a truly heterogeneous class. This makes for an excellent cooperative learning situation among students. The students receive course credit, but no grades. They maintain a performance record which they use in the program, take home as a reporting instrument, and carry on into their high school industrial arts programs.

Students are encouraged to work both independently and to team together. They may set up assembly lines and mass produce, they may pursue construction activities, or they may focus on individual projects and learning experiences which are of interest to them. Systems have been developed to assist the students in their teaming activities. Although the students themselves must determine the number on a team and the operations which each will perform, the system provides them with guidance and general structure.

The opportunity for career guidance was another of the methodological changes which occurred in the development of Occupational Versatility. A career guidance area, prominently located in the shop, is available for students' use according to their needs and interests. The area has two large boards with over 300 careers listed on them. These boards are an easy-to-use directory to books, catalogs, films and tapes which can provide the student with information on careers. The students often become interested in gaining information about careers or future employment related to areas in which they have worked and, at this time, they can come to the Career Guidance area to gain this information regarding these careers of their choice.

Summarily, Occupational Versatility is a new and innovative approach to industrial arts education which is personalized for the student. The major components are a multi-experience general shop facility, team teaching, student management, a self-instructional system for learning, ungraded heterogeneous grouping, career guidance opportunities, a non-graded approach to reporting student performance and granting course credit. The Occupational Versatility approach is designed around the learning methods which students can employ in an educational setting, and the focal point is the individual student.

CONTEXT

Occupational Versatility has been located in three school districts during the July 1, 1969 through June 30, 1972 granting period. These districts are Highline, Renton and Franklin-Pierce; all are located in the western sector of the State of Washington. Highline, serving as local education agency for the grant, houses the project director and his staff.

Occupational Versatility Programs

District	School	Grade Levels Served
Highline	Chinook Junior High School	7-8-9
Renton	McKnight Middle School	6-7-8
Franklin-Pierce	Keithley Junior High School	8-9

The Highline School District, which houses the Occupational Versatility program at Chinook Junior High, is a major suburban community of Seattle with as estimated population of 129,000 residents. The area has rapidly evolved from an agrarian economy into a major suburban center over the last two decades and is situated south of Seattle, the major metropolitan city in Washington State. The district serves an area of approximately 35 square miles, which is the most densely populated suburban community in the Northwest with an approximate population of 3,700 people per square mile. The Seattle-Tacoma International Airport is situated within the confines of the district.

The economic base of the residents of the Highline District ranges from lower-upper class homes in distinct areas to a large area of lower-class homes on the northern perimeter of the district. Approximately 20% of the students in the schools come from homes which meet the poverty criteria as outlined by the U. S. Office of Economic Opportunity. The vast preponderance of remaining students come from either blue-collar or middle-class and professional homes, and apparently make an attempt to continue their education beyond high school, as follow-up studies have indicated that approximately sixty percent of the Highline District's graduating high school students enter either a junior or a four-year college.

The economic trend in the area was one of stable growth for more than 20 years until the economic recession began with employment layoffs at the Boeing Company, the areas's largest employer. A majority of the workers in the Highline District were employees of Boeing, and the reduction in the work force has seriously affected the economic situation for a large number of the residents within the area, to the extent that present unemployment comprises approximately 18% of the available work force.

The Highline School District is the fourth largest school system in the State of Washington, with just over 27,000 students enrolled at the conclusion of the 1971-72 school year. Facilities include 5 senior high schools, 9 junior high schools, 33 elementary schools, 2 special education schools and a vocational school. A declining economic and employment picture has had the effect of causing a 7.2% decline in student population over the past three years, with a concurrent drop-out rate of just less than 4%.

The average yearly education cost per pupil in the district is $823.00, which is above the statewide cost per pupil of $741.13 and indicative of the community's confidence in the school system.

Support for the public schools has been outstanding, despite the unfavorable economic climate. The citizenry in the Highline District has voted favorably on all levies and bond issues since 1951. The total amount of special funding approved by the voters has totaled in excess of 87.8 million dollars from March, 1952 through February, 1972. Community support for the schools has been, and continues to be, at a very high level.

The Renton School District, which houses the Occupational Versatility program at McKnight Middle School, is located in the city of Renton. This is a highly industrialized city, located adjacent to the southeast boundary of Seattle on the south end of Lake Washington. Similar to other industrial communities in metropolitan areas, Renton has experienced a pronounced population growth which is presently leveling off. Present population for the city itself is 28,000 with another 47,000 people living in adjacent unincorporated areas.

The last two years in this area has found the added problem of unemployment. The Boeing Company located in Renton proper has been faced with serious problems requiring extreme cut-backs in level of employment. The unemployment rate in this area is now estimated to be in excess of 18%. Approximately 44% of the school population is included under the Title I Program, and 9% of the families in the community are receiving food stamps while 3% are receiving aid to dependent children. Adults in the community complete a median of 10.5 school years and approximately 30% of each high school graduating class enters a four year college.

The Renton School District is organized on a 6-3-4 basis with eighteen elementary schools (K-5), three middle schools (6-8) and three high schools (9-12).

The total student enrollment is just under 16,000, with a slight decrease over the past year due to the economic problems in the area. The dropout rate is approximately 4.5% with the transfer rate just over 13%; the cost of education per pupil is approximately $700.00.

The District was unable to pass its maintenance and operation special levy in 1971 and operated on a minimum budget basis during the 1971-72 school year. This minimal operating condition will continue in 1972-73, as two of three levy measures were defeated at the polls.

The Franklin-Pierce School District houses the Occupational Versatility program at Keithley Junior High School. The District is located in Parkland, a community just southeast of the State's third-largest city of Tacoma; it represents one of the typical suburban-rural "bedroom" communities on the periphery of a major city.

The population is estimated at 26,000 in a 25 mile square area. Approximately 25% of the working class are directly involved in military positions or military related employment. The majority of all workers are involved in technical employment which is generally unionized. Approximately 10% of the residents are professionally employed, primarily in public school and higher education. No recent figures exist showing the median number of school years completed by adults because census figures include the metropolitan Tacoma area. A postcard survey has recently been completed showing that 170 out of 468 of the 1969 graduating class applied for college entrance.

The Franklin Pierce School District is organized under the 6-3-3 plan with nine elementary schools, two junior high schools, two senior high schools, and a district special education diagnostic center. The district has a total enrollment of just over 8,200 students, and employs nearly 400 certificated faculty members. Two vocational-technical schools, two junior colleges, and two private liberal arts colleges in the greater metropolitan area provide additional educational resources.

Enrollment in the school district grew at a very rapid rate from 1950 to 1968. In 1950 the enrollment was slightly over 1,700, and by 1968 it had reached 8,476. There were 4,585 students enrolled in 1955 and 8,476 in 1968 -- a growth of 84%. The growth rate during this time of expansion usually averaged between 5% and 10%. Recently this growth rate has reversed itself because of a declining birth rate, a sluggish housing market, the lack of sewers and increasing unemployment.

The district has the lowest valuation of any first class district in the state but has had remarkable success at the polls. The district, though, has never failed to receive less than a 60% favorable vote on any issue submitted to the electorate. Two issues, in the history of the district failed to validate because of the 40% requirements, but these issues were subsequently approved. The per pupil expenditures, due to the low valuation, are approximately $75.00 less per pupil than the state average at both the elementary and secondary levels.

The Occupational Versatility program, in addition to continuing operation in these three school districts, will begin operation in six additional districts in September, 1972.

II. Program Description

SCOPE OF THE PROGRAM

Need for the Program

A significant facet of contemporary American culture is continual and rapid change; science and technology have been instrumental in bringing tremendous changes to the lives of the American people. Probably one of the most important by-products of this change is the explosion of knowledge, which is having considerable effect on education. In his book, The Secondary Phase of Education, Lawrence C. Downey discusses this effect:

> "Worthwhile learning takes place, not just in the traditional and formal teaching situation as was once assumed, but rather in a wide variety of situations and as a consequence of a wide variety of teaching techniques.
>
> These situations and techniques fall into three broad categories: (1) learning through receiving knowledge from an expert -- or being taught directly by a teacher; (2) learning through sharing knowledge with colleagues or discussing issues with classmates; and (3) learning through discovering knowledge -- or pursuing individual inquiry."

Former Secretary of Defense, Robert McNamara, in describing a new policy for upgrading the educational qualifications of men inducted into the armed forces, states in an article in the Phi Delta Kappan (Oct. 1966):

> "Students clearly differ in their learning patterns. It is the educator's responsibility to deal with that pattern in each individual case and to build on it. More exactly, it is the educator's responsibility to create the most favorable conditions under which the student himself can build on his own learning pattern, and at his own pace. Ultimately, it is not the teacher who teaches at all. It is the student who teaches himself."

Although many industrial arts educators strongly supported the views of Downey, McNamara and others, there remained a question as to the ways and means to be followed in designing, evaluating, and finally adopting an individualized program. Most industrial arts programs, at the time Occupational Versatility was being conceptualized, were characterized by the instructor being the primary source of information and the lone demonstrator of the manipulative activities. This situation created deterrents to good student machine and tool utilization since the instructor must restrict usage to insure proper and safe standards of operation. Multiple area (wood, plastics, electricity, etc.) activities were also restricted since the instructor can supervise only a limited number of activities.

Many times industrial arts experiences were offerred on the basis of expedient scheduling, rather than student interest. Woodshops, scheduled full of students during the Fall semester, would lie closed and empty during the Spring semester when the instructor was shifted across the hall to teach metal shop. Expensive tools and equipment and large rooms were not being utilized as they might have been. Development of each students' potential could not be realized in such situations.

Often, the lack of instructors was a primary reason for the shifting of industrial arts courses from one shop facility to another. If a lone industrial arts instructor were teaching in the metal shop, the woodshop was closed; if he was in the mechanical drawing classroom, both shops were closed. Modern technological devices and procedures, however, showed promise of assisting the instructor and improving the utilization of facilities. If a student could learn from several sources such as tape recordings, loop films, programmed manuals and other students, the teaching burden on the instructor could be decreased and he could assume the role of a learning facilitator. With the instructor assuming this role, many industrial arts experiences could be made available to the students simply by knocking down the connecting walls of various shops and combining them into a single general shop facility. This thinking crystalized into the Occupational Versatility program.

While many experimental approaches toward improving industrial arts programs are being tested throughout the country, the majority are centered or designed around a certain body of knowledges and skills considered essential for life in today's world. The social implications of our industries and technologies and industrial organizations and operation seem to be the focal points of the curricular design for many approaches.

Occupational Versatility, however, is an innovative approach toward the teaching of industrial arts designed around the learning methods the students employ in the industrial arts environment. Its focal point is the student - the individual - and how he functions in a shop setting.

The major objective established for the student is for him to find his identity in an industrial arts environment, and to have the opportunity to develop his abilities to be self-sufficient, productive, and adaptable. A student exhibiting these abilities will be able to select a problem from a wide range of areas, develop a plan and procedure for solving that problem, draw from resources and instruct himself in the processes and operations required, produce a product, and evaluate the product against his design standards. He will do this independently, utilizing a "mode of operation" that is his; a mode designed by him to fit his needs and his rate of performance.

The development of these characteristics should prepare the student for confronting future problem solving situations in his life, whether they be vocational or avocational. He would be an individual considered to be "occupationally versatile," and could approach a problem being able to saw "I know I am capable and I'm willing to try."

These needs, then, were the basis for a proposal designed by the Metropolitan Area of Seattle Industrial Arts Consultants and titled "Project Occupational Versatility." It was submitted under Title III, "Innovative and Exemplary Approaches to Education." E.S.E.A., Public Law 89-10, and was funded for planning and operation which commenced in the fall of 1969.

Procedures

Four counties with 46 school districts comprise the Project area, with the total population being approximately two million or about two-thirds the State of Washington. One hundred and seventeen junior high and/or middle schools benefit from the operation of the three pilot schools. One pilot school is Chinook Junior High (7-8-9) in the Highline School District, a large suburban district bordering Seattle on the south. Another is McKnight Middle School (6-7-8), in the City of Renton. Renton is a small city of about 28,000 and the

home of the commercial division of the Boeing Airplane Company. The third pilot school is Keithley Junior High School (7-8-9) in the Franklin Pierce School District, which is a suburban community just southeast of Tacoma.

To meet the objectives designed for operational testing of Occupational Versatility, the following general procedures were adopted:

The program will be ---

- personalized; the student will elect the activity areas he desires, select the problem he wishes to solve, and will perform at a rate established by his abilities.
- non graded and ungraded; all class and experience levels will work together and will record their performances for reporting purposes.
- team taught in a large single general shop facility.
- self instructional; media of all types will provide the necessary instructions.

The 1969-70 school year was the planning year for the program. The Project staff, consisting of a Director and an Assistant Director, the five pilot school teachers, and the Metropolitan Area Industrial Arts Consultants, designed the methods and the particulars to be used to meet the general objectives and procedures. Facilities were remodeled in the summer of 1970. In the fall of 1970, Chinook and McKnight went into operation with Keithley being opened in the Fall of 1971.

The facilities at Chinook Junior High and McKnight Middle School both have areas of 6500 square feet, with Keithley Junior High being 5600 square feet. There are three teacher stations and enrollment limitations are set at 90 students. The shop facilities are often described as a supermarket of activities, as they are one large room with activity areas around their perimeter (see pictures on pgs. 41, 42 & 43. Finish rooms and teachers offices are the only separated areas.

The activity areas are: woods, both hand and machines; plastics; power, primarily small gas engines; electricity/electronics; graphics; metals, including gas and arc welding, forge, foundry, bench, sheet and art metal; crafts, including leather, jewelry, and carving; general industries, including masonry, glass, tile, roofing, laminates, drywall, etc.; drawing, both freehand and instrument; and career guidance.

Each area is self-contained and color-coded. All materials are open and housed within their respective areas. Open tool panels and project displays are on the walls and the necessary instructional media and machines are on the specifically designed work stations. Planning stations are also provided in each area. No chairs or stools are provided as all stations are designed for stand up activities. Machine areas are compatibly located and removed from natural traffic flow. Machines are color-coded, and the area is entered only by those students wishing to operate.

All three schools operate on a regular scheduling basis. New students come to the shop every hour. The class structure (grouping by grade level) is not a concern of the shop program as each student is considered as an individual. When entering the shop they take a colored, numbered notebook from the record case. The color indicates the period, and the number of the student. They proceed

immediately to the elected activity area and go to work. Role is taken by the office girls and an absent student is indicated by his notebook still being in the case.

The notebook serves two major purposes. First, it provides housing for the students records. Secondly, it provides the basis or the medium for a teacher-student relationship. The teacher's role is to provide guidance and assistance in helping the student solve his problems. The notebook reflects the student's progress, and conferences with teacher and student are enhanced through this record.

Operational guidance material is provided for students in their notebooks, as well as the following record keeping forms:

Attendance and Time Utilization Record - the student maintains his attendance record as well as indicating start and completion dates of his projects.

Materials Cost Record - the student may cut material as he needs it and he computes the cost and enters it on this form; he also enters his payments and keeps a current balance.

Student Performance Record - the students record their activities and operations as well as stating their opinions on their activities; this form is used for reporting to parents.

Machine Operation Check List - the student prepares himself for machine operation and then asks the instructor to check him; the form records this information.

Planning Records - the student records and files his plans and procedures in this section.

In the activity areas, a student is presented with three options from which to select. He may elect to work on one of the projects and experiences designed by the staff, a model displayed, and a plan and procedure available; or he may wish to work with an idea in one of the many reference books; or, he may wish to design his own project or experiment. He is encouraged to progress to the design stage, but it is not a requirement.

As the student progresses toward the solution of his elected problem, many instructions are necessary. The objective of the program is for the student to seek out the type of instruction that will serve him best, and many avenues are available for him in this aspect. He may elect to use one of the 200 loop films available, (see recommendations section) or perhaps where video is not necessary, one of the cassette tapes. He could use one of many instruction sheets, charts, programmed texts, or other printed materials. Quite commonly though, it has been found that he may prefer to ask an experienced classmate to teach him how. The teacher is also available if requested and, through his communications, can help the students evaluate the effectiveness of the procedures they are using.

If a machine is needed, the student is to prepare himself for operation and should feel "I am ready to operate this machine" when the time arrives to do so. The analysis procedure is utilized for this preparation. The student may take a specially prepared manual and study the machine. He also may call upon films, texts, and other students to assist him. When he feels he is adequately prepared for operation, he requests a teacher to check him out. A satisfactory

performance demonstration by the student is the key to safe and efficient machine operation.

The career guidance system operates in the same manner as an activity area. A prerequisite to its use, the need of the student, is hopefully established as the student works in the various activity areas. His curiosity as to what the future may be in a career related to areas that interest him often leads him to the "Career Guidance Program Directory." This directory, on two 4 x 8 boards, lists over 300 careers. The Occupational Outlook Handbook, a government publication, was the selection base for the listed careers. The board's function is to direct the student to films, tapes, college catalogs, apprenticeship programs, vocational schools, and any other material that he can utilize for analyzing the careers that interest him. All these materials are readily available to him in the career guidance activity area. A career selection for the future in the working world is not promoted for this age student, but the ability he gains to analyze career opportunities should provide him with a basis to choose wisely when a selection time approaches.

The Occupational Versatility program has been well received by teachers and students alike. Students can and will accept the responsibility of managing their activities. They can and will instruct themselves with a high degree of efficiency and, perhaps most importantly, they enjoy being independent and being able to direct their own learning experiences. The students' productivity has increased markedly, as will be documented in the evaluation section. The teachers have been pleased with how well the program has functioned, and are now assisting in its exportation to other schools and districts. The demand for exportation is, perhaps, one of the most significant measures of the program's success.

Personnel

Occupational Versatility requires no additional personnel; the present industrial arts teaching staff of any school should be fully capable of implementing the program. The size of the industrial arts staff is not a crucial factor; Occupational Versatility is operable with one, two or three teachers. Two of the pilot programs were staffed by three teachers, and the other by two; the program beginning in September of 1972 at Anacortes Junior High School will be staffed by a single teacher as will that at Snoqualmie Middle School in September, 1973.

In remodeling an existing industrial arts shop into an Occupational Versatility design, additional floor space is gained. This increase occurs through the elimination of closed storage areas, which are generally separate rooms. All materials storage in Occupational Versatility is open and located within or adjacent to the appropriate activity areas. With a few additional physical modifications, Occupational Versatility can also accomodate art and home economics programs.

Administratively, the scheduling of students becomes more flexible and simplified. As groupings are heterogenous in regard to sex and grade level, any student may be scheduled into the shop during any period. As the curriculum is individualized and personalized, a student may enter at any time during the year and not be penalized by lacking knowledge of what occurred in the program prior to his entry. These administrative advantages facilitate easier scheduling and transfer, and do not lock the student into a fixed-length curriculum.

Although a district adopting Occupational Versatility will not incur the expense of additional personnel, budgeting for staff salaries to prepare the shop in the Versatility model and also for teacher training and development is strongly advised. It is suggested that the industrial arts teaching staff be contracted for a period of time during the summer in order to prepare the physical facilities to accommodate the program. Funds should also be made available to allow for training and development in methods and operating techniques for each staff member who will be teaching in the program.

developmental costs in adopting the program are now at a level considerably lower than those encountered in opening the pilot programs at Chinook Junior High and McKnight Middle School in September of 1971. The summer workshop for those teaching staffs was eight weeks in length, and the teachers were also contracted for an additional four hours per week during the 1971-72 school year (a total of 144 additional hours). This was followed by another summer workshop in August of 1971, four weeks in length. Developmental time, as a result of the progress made during the pilot phase, has been considerably reduced from the original amount required to implement the program.

The following descriptive table may provide potential adopters of Occupational Versatility with general information concerning the range of shop sizes and number of teachers and activity areas.

District	School	Number of Teachers in the Shop	Square Feet of Floor Space	Number of Activity Areas	Date Program began Operation
Highline	Chinook Jr. Hi	3	6500	10	Sept. 1970
Renton	McKnight Middle School	2	6400	11	Sept. 1970
Franklin-Pierce	Keithley Jr. Hi.	3	5500	11	Sept. 1971
Anacortes	Anacortes Jr. Hi.	1	3600	8	Sept. 1972
Auburn	Cascade Jr. Hi	3	5800	11	Sept. 1972
Everett	Carver Middle School	2	5000	10	Sept. 1972
Franklin-Pierce	Ford Jr. Hi.	3	5600	10	Sept. 1972
Mount Vernon	LaVenture Jr. Hi.	2	4300	6	Sept. 1972
Renton	Nelson Middle School	2	5800	5	Sept. 1972
Bend (Oregon)	Pilot Butte Jr. Hi.	3	6400	9	Sept. 1972
Everett	Port Gardner Middle School	2	4600	9	Sept. 1972
Highline	Sylvester Jr. Hi.	2	5800	9	Sept. 1972
Tacoma	Jason Lee Jr. Hi.	3	8500	8	Sept. 1972

Although the recommended amount of floor space per student in an industrial arts shop is 100 square feet, the Occupational Versatility program has functioned very effectively while allowing 70 square feet of floor space per student.

The staff members who taught in the pilot programs at Chinook, Keithley and McKnight ranged in age from 33 to 52, with the mean average age among all eight teachers being 40.5 years. They averaged 14.1 years of previous teaching experience, ranging from 5 to 22 years. Their level of training averaged a bachelor's degree plus 60 credit hours, with a range from a B.A. with no additional training to a B.A. plus 105 credit hours. Although these statistics are essentially descriptive of veteran teachers, the Occupational Versatility learning method should be applicable for teachers of all ages, experience and training levels. The

following table describes the twenty-three staff members who will begin teaching in Occupational Versatility programs in September of 1972:

New Staff Members who will Teach

Occupational Versatility

September, 1972

District	Teacher	Age	Years of Teaching Experience	Level of Education
Anacortes, Wash.	a	29	1/2	B.A. + 30
Auburn, Wash.	a	29	3	B.A. + 45
	b	30	6	B.A. + 45
	c	49	13	B.A. + 60
Bend, Oregon	a	25	2	B.A.
	b	36	7	M.A.
	c	45	22	M.A. + 15
Everett, Wash.	a	34	9	B.A. + 45
	b	36	14	B.A. + 45
	c	52	19	B.A. + 45
Franklin-Pierce, Wash.	a	25	1/2	B.A.
	b	32	8	M.A. + 15
	c	40	16	B.A.
Highline, Wash.	a	28	3	B.A.
	b	36	8	B.A. + 60
Mount Vernon, Wash.	a	37	10	B.A. + 90
	b	51	7	B.A. + 60
Renton, Wash.	a	27	5	B.A. + 45
	b	44	14	B.A. + 90
Tacoma, Wash.	a	29	5	B.A. + 105
	b	31	4	B.A. + 45
	c	38	7	B.A. + 135
	d	46	18	B.A. + 135
Range		25 to 52 yrs.	1 to 22 yrs.	B.A. to M.A. + 15
Mean Average		36.1 yrs.	8.7 yrs.	B.A. + 60

Evaluation data should be collected by the adopting district, and this will require the use of some teacher and clerical time. Districts which have data processing or research departments could utilize the services of these divisions to evaluate the program. The amount of time required would vary according to the number of students in the Occupational Versatility program, and by the number of objectives evaluated. Many evaluation forms have already been developed and refined which, if used by the importing district, could minimize those evaluation expenses.

Budget

The major source of funding for Occupational Versatility has been Title III, E.S.E.A. although the Highline School District, local education agency for the grant, has contributed to the total expenditure budget by providing custodial services, and utilities, telephone and mailing costs, and assuming the cost of remodeling the shop facility at Chinook Junior High School. The District is also assuming housing costs for the Occupational Versatility staff during the upcoming 1972-73 exportation period.

Title III support for Occupational Versatility was granted initially in July of 1969 and will culminate following the exportation efforts in June of 1973. An annual summary of grant support follows:

1969-70	$59,995.00	Planning Year
1970-71	$63,500.00	Operational Year
1971-72	$70,000.00	Operational Year
1972-73	$55,150.00	Exportation Year
Total	$248,645.00	4 years

The major costs absorbed by this Title III support as the program developed were primarily the professional and non-professional salaries of the staff, which constituted approximately 75% of the developmental expenses. The remainder of the monies purchased equipment, supplies, materials, travel and contracted services.

As the program is now ready for exportation, an overview of the cost to an adopting school district is appropriate. Because Occupational Versatility is a learning method, the number of activity areas in the program is flexible and dependent upon the needs and interests of the importing school district. Generally, the greater the number of activity areas the higher the cost, as activity areas require self-instructional materials, tools, and equipment.

Facility remodeling expenses will likely range from $1,000.00 to $15,000.00, depending upon the size of the shop and the extent of remodeling necessary. Just in converting closed storage to open storage, the average shop facility will increase about 10 - 20% in square feet of floor space. Removing walls to include another classroom and/or hallway space also provides for a significant increase in available floor space.

Self-instructional materials expenses are likely to range from about $3,000.00 to $5,000.00, depending upon the quality and quantity of the materials and equipment purchases. Included in this category are loop films, projectors, screens, tapes, cassette tape recorders, and instruction sheets.

The student management system has been found to cost approximately $1.50 per student. This figure includes notebooks, forms, and secretarial time in duplicating forms and related materials.

Casework will probably range in cost from $1,000.00 to $15,000.00, again dependent upon the required quantity and the desired quality, and whether the work is done by the existing industrial arts staff or contracted to a commercial firm. Included in casework expenses are the general notebook case, area notebook holders, book racks, film racks, area signs, tape racks, area stations and planning stations.

New equipment expenses depend upon the equipment presently available, and the needs and interests of the importing district. Not only may the number of activity areas vary from shop to shop, but also the depth of experiences offered in the same area may vary widely from program to program. As an example, the graphics area may include any or all of the following equipment: sign press, engraving machine, paper cutter, stamping machine, block printer and/or offset press. No range of new equipment expenses is indicated; this depends entirely upon the adopting district.

As was mentioned in the Personnel section, funds should be budgeted to allow additional time for the industrial arts staff to prepare the physical facilities in the shop to accommodate the program. Funds should also be made available to allow for training and development in methods and operating techniques for each staff member who will teach in the program.

A district adopting the program that wishes to gain more detailed information should contact either:

Mr. John Lavender, Director or
Mr. Bill Guise, Assistant Director
Project Occupational Versatility
Highline Public Schools
P. O. Box 66100
Seattle, Washington 98168.

EVALUATION

Objective evaluation of Occupational Versatility was undertaken during the 1970-71 and 1971-72 operational years of the program. For the convenience of the reader, each objective being assessed is stated immediately preceding the discussion of its evaluation.

Operational Year 1970-71

Student Objective #1

The student will manage his activities in the shop. He will:
- record his daily attendance
- compute and record his material & supply purchases for each project
- maintain a neat and orderly work station.

The recording of daily attendance was accomplished by the students through filling in their Attendance and Time Utilization Record forms. This form may be found in the Appendix on page 44. Every student notebook was examined by the Occupational Versatility Director or Assistant Director on three occasions at Chinook Junior High School and on two occasions at McKnight Middle School to determine how accurately the students had maintained these forms. A summary of the resulting data follows:

Reporting Period	Percent of Students Recording Own Attendance	Percent of Students not Recording Own Attendance
1st Quarter (Chinook)	79%	21%
1st Trimester (McKnight)	90%	10%
2nd Quarter (Chinook)	95%	5%
2nd Trimester (McKnight)	90%	10%
3rd Quarter (Chinook)	97%	3%
Totals	90.2%	9.8%

This data reflected a level of student performance which was judged to be satisfactory by the Occupational Versatility teachers. The attendance system is so designed that even though 9.8% of the students did not have their attendance records maintained up-to-date, attendance was still accurately recorded by the office girls every day by marking absent those students whose notebooks were not removed from the general notebook case.

Students were required to enter their material purchases, their shop payments, and their balance of funds on the Material Cost Record form. To determine how accurately the students had maintained these forms, every notebook was examined by the Occupational Versatility Director or Assistant Director. The data collection schedule was the same as that employed for assessing the attendance records. A summary of the materials cost record maintenance follows:

Reporting Period	Percent of Students Recording Materials Costs & Expenditures	Percent of Students not Recording Materials & Expenditures
1st Quarter (Chinook)	90%	10%
1st Trimester (McKnight)	91%	9%
2nd Quarter (Chinook)	99%	1%
2nd Trimester (McKnight)	96%	4%
3rd Quarter (Chinook)	99%	1%
Totals	95.0%	5.0%

This data reflected a level of student performance which was judged to be satisfactory by the Occupational Versatility teachers. An analysis of materials purchases according to monetary receipts in the school office at Chinook not only supported the adequacy of student performance in maintaining their Materials Cost Record forms, but also revealed that productivity had doubled. In 1969-70, with a non-Occupational Versatility industrial arts program, student expenditures totaled $2,227.04. In 1970-71, with the Occupational Versatility program in operation, student expenditures were $4,480.48, reflecting an increase of 101.2 per cent.

Clean-up was also a responsibility of the students. No organizational systems were utilized and students were counseled, rather than directed by the teachers, as to their responsibilities. By November, the clean-ups were satisfactory to the teachers and students. This activity has become a natural response for the students and they have accepted it as part of their responsibility in a shop setting. No formal measurements were designed to assess the adequacy of clean up activities, as teacher and student satisfaction seemed to be more important considerations than some mode of structured observational assessment.

Seventy-one visiting educators, responding to the following questionnaire, indicated they believe the students in Occupational Versatility can and do take the responsibility of managing their activities in the shop and, further, that they do so to a high degree of efficiency.

Questionnaire

THE STUDENTS

		1	2	3	4	5
1.	Did the students appear to be able to follow the procedures of the program? Mean = 1.48	(47) Most of Them	(19)	(4) Some of Them	(2)	None of Them
2.	Did the students appear capable of independent action? (Not relying on direction from the teacher). Mean = 1.59	(42)	(19)	(7)	(3)	
3.	Did the students appear to accept responsibility? Mean = 1.61	(38)	(22)	(8)	(2)	
4.	Did the students appear to be able to plan their procedures? Mean = 2.00	(26)	(27)	(14)	(5)	
5.	Did the students appear capable of self-instruction? Mean = 1.85	(32) Most of Them	(20)	(17) Some of Them	(2)	None of Them

Student Objective #2

The student will at the end of the school year, be able to select an instructional device and/or develop his own procedure that will:

- direct his operation of tools and equipment
- give the steps necessary for completing a process
- direct him to a needed resource.

Student selection of instructional devices was assessed by seventy-one visiting educators, who responded to the following questionnaire, after observing the students working in the Occupational Versatility shop:

To get the instruction they needed, what resources do you think the students went to, and what percent of the time to each? In the second column, indicate resource use and percent of time in your own industrial arts program.

Instructional Resources	Percent of Time Utilized by: Occupational Versatility Students	Your Industrial Arts Students
Books	7.1%	10.4%
Tapes	10.2%	.9%
Instruction Sheets	12.2%	7.1%
Other Students	45.2%	13.8%
The Teacher	11.4%	65.6%
Films	13.9%	2.2%

The above observations indicate that the Occupational Versatility students utilized instructional resources other than the teacher nearly 89% of the time as they developed their own operating procedures. In comparison, the visiting educators indicated their own industrial arts students utilized instructional resources other than the teacher only 34% of the time.

The Student Performance Record forms provided documentation of the activity areas in which the students worked, and also the operations that were performed in those processes which they undertook. Every student notebook was examined by the Occupational Versatility Director or Assistant Director on three occasions at Chinook Junior High School and on two occasions at McKnight Middle School to determine what performance had occurred. A summary of the resulting data follows:

Reporting Period	Average Number of Activity Areas in which Students Worked	Average Number of Operations which Students Performed
1st Quarter (Chinook)	5.2	14.3
1st Trimester (McKnight)	4.5	10.0
2nd Quarter (Chinook)	6.7	24.5
2nd Trimester (McKnight)	6.0	14.5
3rd Quarter (Chinook)	8.4	34.8

* Chinook figures may be viewed as cumulative; those for McKnight are separate and distinct due to an entirely new student population in the 2nd Trimester.

The above figures established that the students were exploring several activity areas in the shop, and that they were performing numerous different oper-

ations in those processes which they pursued.

An assessment of how students planned their projects was undertaken concurrently with the study of the Student Performance Record. A summary of this data follows:

Reporting Period	Percent of Students with Complete or Partial Project Plans	Percent of Students with Complete or Partial Step-by-Step Procedures
1st Quarter (Chinook)	19%	35%
1st Trimester (McKnight)	76%	71%
2nd Quarter (Chinook)	50%	88%
2nd Trimester (McKnight)	67%	66%
3rd Quarter (Chinook)	81%	92%

The planning done by the students was not of as high a quality as was desired. Although the students indicated that planning was their least-liked activity area in the shop, it was felt that some improvement in planning could be generated. This was accomplished by upgrading the self-instructional system for planning, and through a late-year thrust by the teachers to encourage better planning.

The teachers, since becoming aware of the need for more assistance in the planning phase, revised the planning form and required the students to have their plans checked before starting a project. This provided an opportunity to assist students as needed and the results have proved positive (see Chinook, 3rd Quarter).

Student Objective #3

The student will develop a safety perception and safe habits as determined by:

- the operation and use of tools and equipment
- the concern for his fellow worker
- the recognition of unsafe conditions.

Two of the statements on the Student Performance Record which the student uses to evaluate himself are concerned directly with his attitude toward operating machines. These statements, and the cumulative student responses to them, are summarized below:

Reporting Period	Statements: "I only operate a machine when I"m positive I know how"	Statements: "I know the safety rules of any machine before turning it on"
1st Quarter (Chinook)	4.77	4.72
1st Trimester (McKnight)	4.50	4.50
2nd Quarter (Chinook)	4.59	4.59
2nd Trimester (McKnight)	4.39	4.39
3rd Quarter (Chinook)	4.61	4.51
Totals	4.57	4.54

Scale: 5.0 = All of the time
4.0 = Most of the time
3.0 = Half of the time
2.0 = Some of the time
1.0 = None of the time

Mean Average for all student self-evaluation statements = 4.16

The safety statements were found to be the two items which received the highest rating from the students. This is indicative of their perception toward safety, and it also indicates that they feel their safety habits are good. The teachers have stated that almost all of the students have not attempted to use any machine without going through the procedure set for them. These statements also suggest a very positive attitude on the part of the students toward general safety and safe machine operation.

Student Objective #4

The student records his activities and evaluates his performance by:

- recording on his Performance Record the areas he worked in and the operations he performed
- expressing his opinion of his activities in the shop.

Student recording of activities and self-evaluation of performance was accomplished through utilization of the Student Performance Record. The student keeps a master copy of this record, makes a copy and consults with his teachers at grading period, and then takes it home. The efficiency of the students in following this procedure is indicated in the following table:

Reporting Period	Percent of Students Accurately Maintaining their Performance Records	Percent of Students Maintaining their Self-Evaluation Forms
1st Quarter (Chinook)	96%	92.2%
1st Trimester (McKnight)	94%	93.1%
2nd Quarter (Chinook)	94%	90.6%
2nd Trimester (McKnight)	97%	94.8%
3rd Quarter (Chinook)	100%	99.0%
Totals	96.2%	93.9%

This data reflected a level of student performance which was judged to be satisfactory by the Occupational Versatility teachers.

The following table indicates the students' opinions of their activities as recorded on the back of their Performance Records. No significant difference was found between 7th, 8th, and 9th graders; between experienced and inexperienced students; or between boys and girls. All students seem to have a positive feeling about their work and this substantiates the similar observations by visitors.

APPENDIX "B" TABLE 13

EXAMPLE - PLACE ARROWS PERIODICALLY	(NOV.)	(DEC.)	(SEPT.)		
I MARK MY NOTEBOOK REGULARLY	ALL OF THE TIME	MOST OF THE TIME	HALF OF THE TIME	SOME OF THE TIME	NONE OF THE TIME

	ALL OF THE TIME	MOST OF THE TIME	HALF OF THE TIME	SOME OF THE TIME	NONE OF THE TIME
I HELP MY FELLOW STUDENTS WHEN THEY ASK ME TO.		↓			
I ASK OTHER STUDENTS TO HELP ME WITH MY PROBLEMS.			↓		
I LEAVE MY WORK AREA IN GOOD SHAPE FOR THE NEXT PERSON.		↓			
IF I SEE AREAS THAT NEED CLEANING, I GO AHEAD AND CLEAN THEM.			↓		
MY TIME IS VALUABLE SO I USE EVERY MINUTE.		↓			
I KNOW THE SAFETY RULES OF ANY MACHINE BEFORE I TURN IT ON.	↓				
I ONLY OPERATE A MACHINE WHEN I'M POSITIVE THAT I KNOW HOW.	↓				
MATERIALS COST MONEY SO I AM CAREFUL IN SELECTING PIECES THAT WILL ELIMINATE WASTE.	↓				
BEFORE WORKING ON A PROJECT I MAKE A LIST OF THE NECESSARY STEPS IN THE ORDER THEY OCCUR.	↓				
I FIND THINGS THAT I WANT TO MAKE.	↓				
I COMPLETE PROJECTS THAT I START.	↓				
WHEN TEAMING WITH OTHER STUDENTS ON A PROJECT I DO MY SHARE.		↓			
I USE THE PLANNING SHEET IN THINKING THROUGH MY ACTIVITIES.		↓			
I HAVE THE TIME TO ACCOMPLISH ALL THAT I WANT TO DO.		↓			
I AM PROUD OF MY ACCOMPLISHMENTS IN THE SHOP.		↓			
I LIKE TO MAKE PROJECTS OF MY OWN DESIGN.			↓		
I KEEP MY NOTEBOOK UP TO DATE.		↓			
I USE THE RESOURCE MATERIALS PROVIDED IN THE SHOP.		↓			
I KNOW WHAT I'M CAPABLE OF DOING AND I WORK WITHIN THOSE LIMITS.		↓			

AVERAGE MARKING BY BOTH SCHOOLS BASED ON (4) RECORDING PERIODS

Conclusions Regarding Student Objectives, 1970-71

The evaluations of the student objectives this year clearly indicate the students can and will manage their affairs and can and will instruct themselves. The Project staff and observers agree that the students are responsible both to self and the shop society.

It would appear that the Occupational Versatility learning system does allow the student to find his identity and develop the abilities to become self-sufficient, productive, and adaptable. Observations say "yes", this has been accomplished; a doctoral study conducted by Dr. Jack Starr, (of Oregon State University, 1971) substantiates this position. In his study, Dr. Starr utilized the Student Performance Observation Sheet (see Appendix, page 47) and three industrial arts consultants as observers. These professionals rated the Occupational Versatility students significantly higher on the traits of self-sufficiency, productivity and adaptability than their counterparts in non-Occupational Versatility industrial arts programs. A summary of their findings follows:

		Self-Sufficiency	Productivity	Adaptability	Total
(n = 138)	Occupational Versatility students	10.96	10.44	10.59	31.99
(n = 137)	Non-Occupational Versatility students	8.93	9.20	9.55	27.68

Analysis of Variance

Area	F-ratio	Meaning
Self-Sufficiency	F = 45.76	Occupational Versatility significantly higher (.005) than traditional industrial arts.
Productivity	F = 25.98	Occupational Versatility significantly higher (.005) than traditional industrial arts.
Adaptability	F = 20.38	Occupational Versatility significantly higher (.005) than traditional industrial arts.

Dr. Starr also studied problem solving beliefs and problem solving self-confidence of these students, using the Childhood Attitude Inventory for Problem Solving. He found that Occupational Versatility students showed significantly greater gains in both of these areas than did the non-Occupational Versatility students. The following tables show these differences:

Mean Gains

	Problem Solving Beliefs	Problem Solving Self-Confidence	Total Score
Occupational Versatility Students (n = 69)	4.19	3.80	7.99
Non-Occupational Versatility Students (n = 68)	0.57	0.51	1.08

Post Test Scores

	Problem Solving Beliefs	Problem Solving Self-Confidence	Total Score
Occupational Versatility Students (n = 138)	55.23 **	56.49 *	111.72 **
Non-Occupational Versatility Students (n = 137)	52.84	54.62	107.46

* Significantly higher, .05 level of confidence.
** Significantly higher, .01 level of confidence.

Operational Year 1971-72

Student Objective #1: The students will show significant growth in recognizing the necessity of planning their activities, as indicated by movement to higher order responses on an instrument designed to assess recognition of the necessity for planning.

An evaluation instrument, Recognizing the Necessity of Planning, was developed from suggestions made by the eight teachers currently working in Occupational Versatility shops. A field test was then run with 42 industrial arts students in another school district to determine construct validity of the instrument. The students were divided into two groups, A and B, with 21 in each group. Those in Group A were selected by the industrial arts teachers on the basis of positive attitude, excellence in planning, and excellent productivity. Group B was composed of students observed to have negative attitudes, do inferior quality planning, and show minimum productivity in their industrial arts classes. The field test results were revealing; differential recognition of planning and no significant difference existed between the mean averages of the groups. As the previous shop experience of the two groups was extremely similar, these field test results suggested that growth to higher order responses in recognizing planning necessity would be no more likely to occur than a reverse trend to lower order responses. In other words, change might reasonably be neither significant nor linear with similar probability of increase and decrease.

A baseline mean score for the instrument was established using these 42 students who participated in the field testing and 126 students from Franklin-Pierce (prior to their entry into Occupational Versatility on September 15, 1971). This mean score, 69.58, has provided a comparative statistic in addition to scale position (which established 56.00 as the neutral or mid-point score).

The evaluation was administered monthly to a 25% sample (non-replacement) of the students in Occupational Versatility's three shops, with the October through May results summarized in the following table:

	Mean Score	n
October	72.17	273
November	76.67	256
December	73.64	201
January	67.34	148
February	71.82	167
March	71.40	174
April	70.56	185
May	70.01	148
Sept.-May Mean Average	71.20	1552

Interpreting the statistical results, it is apparent that there is no consistent movement toward higher order responses. The typical student seems to view planning as rather important, significantly higher at the .01 level of confidence, than the instrument's neutral point of 56.00 and approximately three points higher than typical industrial arts students in non-Occupational Versatility shops. It seems apparent, from these results, that Occupational Versatility students are recognizing the necessity of planning to a commensurate if not higher degree than are their counterparts in other industrial arts programs.

Student Objective #2: The students will exhibit a significant increase in positive attitude toward planning their activities, as measured by a scale designed to assess attitudes toward the planning of activities.

An evaluation instrument, Attitude Toward Planning, was developed from recommendations made by the eight teachers currently instructing in the existing Occupational Versatility shops. A field test of this instrument was run with 42 industrial arts students in a neighboring school district to determine construct validity. The student groupings for this field test were explained under Student Objective #1.

The field test results indicated that considerable differences in attitude toward planning existed within groups, though differences between groups did not reach the .05 level of statistical significance. Directionality was as predicted; the positive attitude student group scored a mean average of 99.81, while the negative attitude group had a mean average of 91.52. Previous shop experience of the two groups was similar.

The field test results suggest that attitude toward planning is likely an individual matter. Attitude scores correlated to a significant degree (r= .81, significant at .001 level of confidence) with students' recognition of the necessity of planning (i.e., cognitive-affective relationship was observed to be high in the area of planning).

A baseline mean score for the instrument was established using the 42 students who participated in the field testing, and 127 students from the Franklin-Pierce School District. This mean score, 91.64, has provided a comparative statistic in addition to scale position (which established 80.00 as the neutral or mid-point score).

The evaluation was administered monthly to a 25% (non-replacement) sample of the students enrolled in Occupational Versatility's three shops, with the October, 1971, through May, 1972 results summarized in the following table:

	Mean Score	n
October	95.78	279
November	99.53	245
December	97.34	184
January	92.00	168
February	93.60	180
March	95.80	156
April	96.80	164
May	97.44	148
Sept.-May Mean Average	96.04	1524

Interpreting the statistical results, it is found that the movement is variable rather than toward higher order responses. The typical student appears to like planning, as the mean average score is significantly higher at the .01 level of confidence than the instruments' neutral point and approximately six points higher than the average score of typical industrial arts students in non-Occupational Versatility shops. It seems apparent, from these results, that Occupational Versatility students have variable feelings averaging to a "like" or positive attitude toward planning which are commensurate with, if not higher than, the slightly positive attitude toward planning of their counterparts in other industrial arts programs.

Student Objective #3: The students will be able to plan a project to their own satisfaction and to the satisfaction of the Project Occupational Versatility staff, and the satisfaction of students and instructors will show a 90% level of mutual agreement by the conclusion of the 1971-72 school year.

A pair of evaluation instruments, Student Satisfaction Index and Teacher Satisfaction Index, were developed with the assistance of the eight teachers currently instructing in the Occupational Versatility shops. These instruments have six questions, identical for both students and teachers, which directly assess degree of satisfaction. Direct comparison of these questions from both the student's and teacher's form yields a level of mutual agreement, determined as a percentage figure. These instruments were not formally field-tested; they appear, however, to have face validity as determined subjectively by Occupational Versatility teachers and a sampling of students.

In the Spring of 1972, a minimal amount of baseline data was collected from a non-Occupational Versatility industrial arts program in a neighboring junior high school. Utilizing a sample of 23 students, the following results occured: general agreement between teacher and student, 63.8%; student mean score, 32.06; and teacher mean score, 31.86. This information has provided comparative statistics in addition to scale position, which establishes 24.00 as the neutral or mid-point score.

The evaluation has occurred on a differential basis for the three Occupational Versatility shops, and has resulted in fluctuating monthly sample sizes. Generally, students and teachers completed a Satisfaction Index only if a project took two weeks or longer to complete. Data was collected for the 1st, 2nd and 3rd quarters at Chinook, the 1st and 2nd trimesters at McKnight, and for the entire year (excluding the interim month of January) at Keithley Junior High School. The use of the Satisfaction Index was initiated in late October of 1971, and summary tables of results follow:

Chinook

	Degree of Agreement	Student Mean Score	Teacher Mean Score	N
October	70.2%	32.66	35.96	50
November	79.8%	31.64	34.22	93
December	78.4%	33.90	35.51	48
January	84.2%	33.20	35.42	20
February	82.9%	34.31	36.49	35
March	82.3%	32.19	34.52	31
Total	78.8%	32.73	35.16	277

McKnight

	Degree of Agreement	Student Mean Score	Teacher Mean Score	N
November	77.9%	34.75	38.47	77
December	91.7%	37.04	39.21	22
January	79.6%	36.22	36.57	34
February	85.7%	35.42	37.04	28
Total	81.5%	35.49	37.92	161

Keithley

	Degree of Agreement	Student Mean Score	Teacher Mean Score	N
November	72.1%	32.86	31.93	27
December	72.2%	32.78	32.35	42
January	-----	-----	-----	--
February	77.5%	33.00	35.43	23
March	76.9%	32.42	35.84	31
April	77.1%	33.31	35.75	16
May	72.0%	32.46	35.50	22
Total	74.3%	32.76	34.16	161
	78.3%	33.47	35.63	599

Interpreting the statistical results, it is found that a high level of mutual agreement, 78.3%, exists between teachers and students on the Satisfaction Index. Although the 90% level stated in the objective was not attained, this 78.3% level of agreement was appreciably higher than the 63.8% reached in a non-Occupational Versatility industrial arts program. The students were found to be somewhat more critical in evaluating their own work than were their teachers; the mean score for 599 student self-evaluations was 33.47, about two points lower than the teachers' mean score of 35.63. The students' mean scores reflected a high degree of satisfaction with their work, and was somewhat higher than that expressed by their counterparts in a non-Occupational Versatility program. Those staff members who had previous experience teaching in the Occupational Versatility program expressed a somewhat higher level of satisfaction with their students' work (36.17) than did those teachers who were experiencing their initial year in the program (34.16).

Student Objective #4: The students will develop significantly more positive attitudes toward self instruction as indicated by their increasing satisfaction in instructing themselves, as measured by a scale designed to assess attitude toward self instruction.

An evaluation instrument, Attitude Toward Self-Instruction, was developed from the suggestions of the Project staff and the eight teachers currently employed in the three Occupational Versatility shops. The developers reviewed the final instrument and were in agreement that it had face validity. A field test was not possible, as there presently are no industrial arts programs at the junior high or middle school level in Western Washington which are self-instruct-

ional, other than the Occupational Versatility shops.

Due to the absence of self-instructional programs which could be used to collect comparative student data, no baseline mean score was established for this evaluation instrument. The only comparative statistic available at this time for the Attitude Toward Self-Instruction instrument is a scale position, on which the value 72.00 has been established as a neutral or mid-point score.

The evaluation was administered monthly to a 25% non-replacement sample of the students in Occupational Versatility's three shops. The October, 1971 through May, 1972 results are summarized in the following table:

	Mean Score	N
October	94.98	261
November	92.59	299
December	92.22	186
January	93.06	152
February	95.04	167
March	93.24	148
April	92.52	148
May	90.54	152
Sept.-May Mean Average	93.02	1513

Interpreting these statistical results, it is observed that no consistent movement toward higher order esponses occurred. The movement which occurred was variable, and tended to go slightly downward as the end of the school year approached. On a comparative basis, the student's average attitude toward self-instruction is positive; the overall mean of 93.02 from October, 1971 to May, 1972 is significantly higher at the .01 level of confidence than the scale mid-point of 72.00 and indicates that the students enjoy working within a self-instructional system.

Student Objective #5: The students will be able, by the conclusion of the 1971-72 school year, to show a significant declining dependence upon the instructor as an information resource when working on their projects, as measured by their responses to an information resource scale.

An evaluation instrument, Use of Information Resources, was developed from recommendations made by the Project staff and the eight participating teachers; development was primarily on the basis of available media and information sources in the three Occupational Versatility shops. A field test of this instrument was run with 42 industrial arts students in a neighboring school district, to determine construct validity. The student groupings for this field test were explained under Student Objective #1.

The field test results were substantial; 59.5% of the students listed the teacher as their primary (#1) source of information in non-Occupational Versatility industrial arts programs. Another 31.0% of the students rated the teacher as an important (#2) source of information. Only 9.5% of the students rated the teacher lower than #2 as an information source, and these ratings were either a #3 or #4. The weighted mean for teachers as an information source was 1.46.

No significant differences were found between the two student groups, although slightly more students (14) in the positive attitude group rated the teacher #1 than did those (11) in the negative attitude group.

Baseline weighted mean scores for all information resources were established by utilizing the responses of the 42 students who participated in the field testing, and those of an additional 126 students in the Franklin Pierce School District. These weighted means, listed on the following table, have provided comparative statistics:

Information Resource	Weighted Mean Score
Teacher	1.46
Books	2.47
Other Students	3.97
Magazines	5.31
Instruction Sheets	5.85
Filmstrips & Slides	6.03
Movies (film loops)	6.69
Cassette Tapes	7.94

The evaluation was administered monthly to a 25% (non-replacement) sample of the students enrolled in Occupational Versatility's three shops, with the September, 1971 through May, 1972 results summarized in the following table:

	Weighted Mean Scores									1971-72 School Year
Information Source	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
1. Other Students	2.93	3.24	2.94	2.71	2.75	2.89	3.04	3.11	2.86	2.94
2. Teachers	3.26	3.27	3.24	3.06	3.09	3.33	3.60	3.38	3.55	3.31
3. Movies	3.17	3.88	3.62	4.16	4.05	3.96	4.24	4.52	4.27	3.98
4. Instruction Sheets	4.41	3.93	3.44	4.14	4.19	4.10	3.84	3.94	3.78	3.97
5. Filmstrips	4.33	4.75	4.69	4.98	4.81	4.85	4.98	5.22	4.96	4.84
6. Books	4.81	4.52	4.81	4.87	5.22	4.49	4.35	4.37	4.33	4.64
7. Magazines	6.36	6.46	6.13	6.27	6.03	5.61	5.87	5.89	5.70	6.04
8. Cassette Tapes	6.04	6.66	6.53	6.58	6.17	5.68	6.22	5.88	5.98	6.19

Interpreting the statistical results, it is found that the teacher is not viewed as the primary source of information. Additionally, the "Teacher" weighted mean score is nearly two points (or places) lower for Occupational Versatility than for other industrial arts programs. Using the analysis of variance, this difference was found to be significant at the .005 level of confidence. Introspection of the weighted mean scores over the Fall months indicates there is not a tendency for students to show declining dependence upon the teacher. Instead, the decline appears to be sudden and abrupt, as indicated by the data from the shop in Keithley Junior High School, which began its Occupational Versatility program in September, 1971:

Weighted Mean Scores

Information Sources	Sept.	Oct.	Change
Teachers	1.45	3.87	-2.42
Books	2.39	2.79	- .40
Other Students	4.24	3.25	+ .99
Movies	7.21	3.97	+3.24
Instruction Sheets	6.02	4.04	+1.98

It seems apparent, from the preceding results, that students in Occupational Versatility shops are significantly less dependent upon their teachers as a primary information source than are students in other industrial arts programs.

Student Objective #6: The students will be able, at the completion of their projects, to evaluate their products by stating what they felt they did well, what they did not do well, and what they would do differently if they were to do the same project again.

An evaluation instrument, the Student Satisfaction Index, was constructed to measure progress toward this objective. This instrument was developed with the assistance of the Project staff and the eight teachers currently instructing in the Occupational Versatility shops. The Student Satisfaction Index was designed with 14 questions, including three which directly assess this objective and six which assess progress toward Student Objective #3. Scoring for each of the questions which pertain to Student Objective #6 is on a 0-or-1 point basis, convertible to percentage figures for students and total groups. The instrument has not been formally field-tested at this time; however, it does appear to have face validity, as determined subjectively by Occupational Versatility teachers and a sampling of students.

No baseline mean score has been established for the set of questions pertaining to Student Objective #6. Comparative statistics, collected from 55 students in two non-Occupational Versatility industrial arts programs in neighboring junior high schools, are limited to an "occurred--did not occur" basis, scored "1" and "0" respectively and reported as percentages. The comparison sample yielded these figures: Student stated what he did well, 92.7%; did not do well, 90.9%; would do differently 87.3%. (The instrument does not provide neutral, or mid-point, scores.)

The evaluation occurred on a differential basis for the three Occupational Versatility shops, and has resulted in fluctuating monthly sample sizes (discussed under Student Objective #3). Data was collected for the 1st, 2nd and 3rd quarters at Chinook, the 1st and 2nd trimesters at McKnight, and for the entire year (excluding the interim month of January) at Keithley Junior High School. The use of the Satisfaction Index was in late October of 1971, and summary tables of the results which pertain to Student Objective #6 follow:

		Student Stated What He:			
		Did Well	Did Not Do Well	Would Do Differently	N
Chinook					
October		98.0%	98.0%	98.0%	50
November		95.7%	94.6%	95.7%	93
December		95.8%	91.7%	89.6%	48
January		100.0%	95.0%	95.0%	20
February		97.1%	97.1%	94.3%	35
March		100.0%	96.8%	96.8%	31
	Total	97.1%	95.3%	95.0%	277
McKnight					
November		88.3%	87.0%	87.0%	77
December		95.5%	90.9%	90.9%	22
January		97.1%	94.1%	91.2%	34
February		96.4%	92.9%	92.9%	28
	Total	92.6%	90.1%	89.4%	161
Keithley					
November		96.3%	92.6%	85.2%	27
December		95.2%	92.9%	92.9%	42
January		-----	-----	-----	--
February		95.7%	95.7%	95.7%	23
March		96.8%	96.8%	93.5%	31
April		100.0%	93.8%	93.8%	16
May		100.0%	95.5%	95.5%	22
	Total	95.9%	94.4%	92.6%	161
Grand	Total	95.6%	93.7%	92.8%	599

Interpreting the statistical results, it is found that the objective is being successfully attained. It was indicated in the 1971-72 Continuation Grant Application that a level of 90% completion by all students filling out the evaluation forms would be regarded as successful attainment of Student Objective #6. The final percentages, based upon the responses of 599 students, are slightly above the necessary figure -- ranging from 92.8% to 95.6%. It appears the Occupational Versatility students are successfully evaluating the products of their own work; they are stating what they feel they have done well, have not done well, and what they would do differently if they were to do the same projects again.

(Auxiliary)Student Objective #7: Those students using the career guidance area will be able to select a career choice, gain information about this choice, and record specific information regarding this career choice on a form provided for this purpose.

An evaluation instrument, The Career Choice Form, was refined to assess this auxiliary objective. This instrument, developed for experimental use during the 1970-71 school year, was revised by the Project staff in August of 1971 to provide a more thorough structure for those students utilizing the Career Guidance Board. The refined instrument consists of eleven questions designed to

help students acquire comprehensive over-views of whatever occupations they may choose to study. Instructions for using the form are listed by the Career Guidance Board.

The instrument appears to have face validity, as its entire question structure may be completed after studying any occupation presently listed on the Career Guidance Board. It speaks directly to the factors of education, training, interest, working conditions and employment outlook.

No mean score has been established for the instrument as the questions are designed for a "completion -- non-completion" scoring system. The possibility of making arrangements to collect comparative data did not progress beyond the discussion stage. No comparative or scale-point statistics are presently available for the instrument.

Data collection was possible in the programs at Chinook and McKnight, where the shops have complete career guidance areas, but not at Keithley where the career guidance area is just now being constructed. As was stated in the 1971-72 Continuation Grant Application, the Project staff is interested in how many students will avail themselves of this area and with what effect. Data collection is, therefore, selective, only those students who utilize the area and complete the Career Choice Form are included. The following table summarizes this information:

Use of the Career Guidance Area
September-December, 1971.

	Completed Career Choice Form	Percent of Questions Answered	Number of Students Enrolled
Chinook	9	88.9%	415
Keithley	--	--	--
McKnight	3	100%	370
	12	91.7%	785

Interpreting the statistical results, the objective that 90% of the Career Choice Forms filled out by the students contain at least one response to each question is being successfully attained. The extremely small number of students using the career guidance area and completing the form (12 of 785); 1.53%) however, raised considerable question about the usefulness of this area. To seek possible answers, further evaluation was undertaken. This involved the use of a Quarter Check-Out Survey for 7th graders at Chinook, a Trimester Checkout Survey for 6 and 7th graders and a Semester Checkout Survey for 8th graders at McKnight. Among the questions on each survey were these:

A. Did you use the career guidance area?
Yes _____ No _____

B. Do you know what career you will go into when you finish school and enter the world of work? Put a check (✓) after your answer.

Yes; I know for sure _____
Yes; I think I know _____
Maybe; I have some ideas _____
Not really; I'm not sure _____
No; I don't know _____

With a total of 384 students completing these surveys, the following results were obtained:

Did you use the career guidance area?

	Grade 6	Grade 7	Grade 8	All Students
Yes	20.6%	22.1%	20.4%	21.4%
No	79.4%	77.9%	79.6%	78.6%

Do you know what career you will go into?

	Grade 6	Grade 7	Grade 8	All Students
Yes; I know for sure	6.7%	13.5%	12.5%	12.1%
Yes; I think I know	16.7%	29.8%	26.8%	26.8%
Maybe; I have some ideas	33.3%	25.5%	26.8%	27.1%
Not really; I'm not sure	23.3%	21.1%	17.8%	20.5%
No; I don't know	20.0%	10.1%	16.1%	13.5%

Interpreting these results, it is apparent that significantly more students (21.4%) used the Career Guidance Area than the number who filled out the Career Guidance Form (1.5%). Also, the level of student need for using this resource seems to be differential; the students exhibit varying levels of career choice with considerable similarity among the three grade levels sampled.

During follow-up informal interviewing, many students indicated they would rather work on projects than study about careers. Others stated they did not like to fill out forms, and some suggested that more audio visual media (movies, filmstrips, tapes) be made available to supplement the existing printed material. A few mentioned changing the location of the area.

This information is being considered, and will provide valuable guidelines for (1) revising the present career guidance areas and (2) installing new career guidance areas in other shops as Occupational Versatility is exported to other school districts.

(Auxiliary) Student Objective #8: Those students using the Career Guidance Area will, after completing a Career Choice Form, be able to write opinions as to the desirability of that career to them.

The results obtained in evaluating Student Objective #7 strongly indicated that, considering the present physical placement and use of the Career Guidance Area by students, this objective may not be appropriate to pursue further at this time. Student needs should play a vital part in the instructional objectives of any program; the survey of needs has shown this objective may currently be neither appropriate nor necessary. The objective will not be pursued until changes are effected in the career guidance area to stimulate greater use by the Occupational Versatility students.

Conclusions Regarding Student Objectives, 1971-72

The evaluative information collected during the 1971-72 school year has further substantiated that Occupational Versatility is a functional learning method which is well received by participating students. Occupational Versatility students recognize the necessity of planning to a commensurate, if not higher degree, than their counterparts in other industrial arts programs. Their attitude toward planning activities is also commensurate with, if not slightly more positive than that of their counterparts. They have demonstrated the ability to plan and construct projects with a high degree of personal satisfaction which is also expressed, to an even higher degree, by their teachers.

The Occupational Versatility students utilize all available resources in seeking information, with other students being the most frequently used resource. Occupational Versatility students are significantly less dependent upon their teachers as a primary information source than are students in other industrial arts programs where comparative data was collected. The students' attitude toward working in a self-instructional system is significantly positive. They learn from their various experiences what they have done well, have not done well, and what they could do differently in future situations.

Occupational Versatility students' productivity, assessed in 1970-71, was underscored by the following expenditure summaries compiled in June, 1972:

Dollar cost; Materials Purchased By

Industrial Arts Students

Chinook Junior High

	1969-70 (Regular Program)	1970-71 (Occ. Vers.)	1971-72 (Occ. Vers.)
September-December	$647.49	$1,834.71	$2,280.86
January-June	1,580.55	2,645.77	2,672.37
Entire School Year	$2,227.04	$4,480.48	$4,953.23
Dollar Increase	-----	2,253.44	2,726.19
Percent Increase	-----	101.2%	122.4%

Keithley Junior High

	1969-70 (Regular Program)	1970-71 (Regular Program)	1971-72 (Occup. Vers.)
September-December		$ 750.75	$1,977.68
January-June		611.28	2,055.64
Entire School Year		$1,362.03	$4,033.32
Dollar Increase		------	2,671.29
Percent Increase		------	97.4% *

Percent Increase is determined by adjusting the 1970-71 figures to compare similarly with those of 1971-72. In the 1970-71 school year, the number of shop classes requiring materials purchases was 10; in 1971-72 this number is 15 (3 teachers X 5 periods). The percent increase is within 3% of the increase experienced by Chinook Junior High when they adopted the Occupational Versatility program.

McKnight Middle School

	1970-71 (Occup. Vers.)	1971-72 (Occup. Vers.)
September-December	-----	$1,414.05
January-June	-----	796.06
Entire School Year	-----	$2,210.11

Bookkeeping methods prior to September 1, 1971 prevented retrieval of student expenditures in the regular and Occupational Versatility industrial arts programs. Comparative figures which could provide information on expenditure increases are therefore unavailable.

Student expenditures for materials and supplies have doubled during the first year when Occupational Versatility replaces the regular industrial arts program. Further expenditure comparisons will be made in those schools adopting Occupational Versatility in September, 1972.

Periodic evaluation check-sheets have shown that woods and plastics have continued to be the best liked and most worked in activity areas of the shops. The other activity areas, however, have also received considerable use and are similarly enjoyed by the students. Less than 5% of the students responding to check-sheets indicated "very little" or less enjoyment of the Occupational Versatility program.

Pre- and post-testing, using the Childhood Attitude Inventory for Problem Solving and the Intellectual Achievement Responsibility index, was also undertaken during the 1971-72 school year. Due to student turnover and identification by group rather than individual, it was not possible to determine individual gain scores. A comparison of pre- and post group data showed some positive change in problem solving beliefs and self-confidence. This change of approximately three points was of somewhat lesser magnitude, but in the same direction, as that shown by Dr. Jack Starr's well controlled study during the 1970-71 school year. Responsibility as measured by the I.A.R., showed a slight positive change of less than a point when pre- and post data were compared. This was not particularly surprising, as other studies had suggested that "responsibility" as measured by the I.A.R. was fairly stable and unlikely to reflect much change when administered to students beyond the elementary school. It appears that an instrument composed of questions which would reflect what teachers determined to be "responsible behavior in the industrial arts shop" would be more likely to reflect changes in the degree of responsibility exhibited by students.

More than 70% of the Occupational Versatility students when asked "would you like to take shop again next year?" answered "yes", approximately 26% replied "maybe", while only 4% said "no." Some 99% indicated they helped other students with projects in the course of their shop experience, and better than 97% indicated they had received such help from other students.

Further evaluation will be conducted during the 1972-73 school year in those schools which are importing the Occupational Versatility program. It appears likely, from studies conducted to-date, that the resulting information will further support the adequacy of the program.

DISCUSSION AND RECOMMENDATIONS

Occupational Versatility should be viewed as a learning method, not as a content program. Although the project has operated in curricular area of industrial arts, utilizing a shop facility, it is neither subject area nor content tied. Occupational Versatility has as its focus the individual student, around whom a learning system has been designed. This learning system is student managed, personalized, self-instructional, ungraded and non-graded ---- it is operable with a single teacher or a team of teachers. Content is personalized on the basis of student interest and need, within the parameters of opportunity designated by the school district operating the program.

Acceptability

Occupational Versatility has been one of the most widely-accepted Title III initiated programs to be operated in the State of Washington. It currently has expanded to another school in each of the three districts which operated pilot programs, and is opening in seven other schools in six additional school districts in September, 1972. Another 20 schools have committed themselves to Occupational Versatility and expect to have operable programs within the next two years.

Parents and students are favorable toward the programs, and there is a notable absence of controversy. The shop at Chinook and Keithley has been opened to parents one evening per week during the school year, and numerous people in the community have utilized the facilities. Students have indicated on questionnaires and in casual conversation, that they prefer Occupational Versatility over their other industrial arts experiences. Also, the overwhelming majority of them have indicated a strong desire to continue in the Occupational Versatility program during the upcoming school year.

The reactions of teachers in the program have been positive. Collectively, they see this learning method as more successfully meeting student needs than the teacher-directed, content-centered industrial arts classes which were previously offerred. For the reader interested in the detailed reactions of the Chinook and McKnight teachers to their initial year of teaching in the program, these statements may be found in the Appendix on pages 58 through 62.

Teacher interest in the Occupational Versatility learning method led to the establishment of inservice classes, through the Department of Continuing Studies at Western Washington State College. Six classes have already been offerred, serving more than two hundred teachers from several school districts in Western Washington. Another six are scheduled during Fall Quarter of 1972, and it is anticipated that these will serve a similar number of teachers. A follow-up study of the 119 industrial arts teachers involved in the in-service classes showed that a remarkable 71% (84 persons) were to be implementing Occupational Versatility in total (39) or in part (45) during the 1972-73 school year. The other participants may also be interested in implementing the program, but they have not been in contact with the Director since completing the inservice classes and thus it is not possible to make a definite statement of their intentions.

Communications have been received from a national publisher and a corporation specializing in furnishing educational facilities. Considerable interest has been expressed by both to assist with national dissemination of the Occupational Versatility program.

Effectiveness

Occupational Versatility has shown itself to be an effective program. Studies undertaken during the 1970-71 and 1972-73 school years presented evidence that students using the Occupational Versatility learning method have successfully managed their own learning and maintained their own records. Their productivity has increased nearly 100%, they have become more versatile problem-solvers, and they have assumed responsibility for teaching themselves in the manner they find most satisfying. They have availed themselves of a wide range of diverse learning experiences, have found machines and supplies to be more readily available for use, and have repeatedly demonstrated that the Occupational Versatility learning method is mechanically functional and personally satisfying.

The Occupational Versatility program has also facilitated more flexible and simplified scheduling of students, providing for more administrative efficiency. As groupings are heterogenous in regard to sex and grade level, any student may be scheduled into Occupational Versatility during any period. As the curriculum is individualized and personalized, a student may enter at any time during the year and not be penalized by lacking knowledge of what occurred in the program prior to his entry. These administrative advantages facilitate easier scheduling and student transfers, and do not lock the student into a fixed-length curriculum.

Occupational Versatility is a program which the present industrial arts teaching staff of any school, regardless of how strong or weak any teacher may be, should be fully capable of implementing. Further, the structure of the program provides the teacher who may have difficulty handling students as a group with the opportunity to relate to them as individuals, thus reducing group management problems. Occupational Versatility also provides all teachers with more time to give personalized individual attention to the students.

The question, "Does Occupational Versatility facilitate better learning, in terms of knowledge and skills, than other industrial arts programs?" has been raised and will be studied during the 1972-73 school year utilizing the E.T.S. Cooperative Industrial Arts Tests. Results of this forthcoming study will be made available during the Summer of 1973, as addenda to this report. The study undertaken in 1970-71 by Dr. Jack Starr, Tacoma Public Schools, did indicate that better learning had occurred in Occupational Versatility as measured by the Childhood Attitude Inventory for Problem Solving and the Student Performance Observation Sheet, yet did not investigate the content question as the Cooperative Industrial Arts Tests should do.

Economics

Occupational Versatility costs no more to operate than other industrial arts programs. It is 30% more efficient in the number of students which can be accommodated, as only 70 square feet of floor space is required per student as compared with the recommended 100 square feet for other industrial arts programs.

The installation costs are a factor which of course must be considered by potential adopters of the program. These costs are discussed in the Budget section of this report, and may be found on pages 14 and 15. Essentially the installation costs could range approximately from $2,000.00 to $40,000.00.

Exportation

Occupational Versatility has been granted a fourth year of Title III funding for exportation purposes, which includes several responsibilities for the dissemination of the program throughout our nation's schools. The staff will be involved in designing a system for installation of Occupational Versatility, and will be able to gain practical information for this design from the nine schools which will be gained during the development of the installation system.

Career Guidance, an activity area which has received some informal attention from the students, appears to be a worthwhile aspect of the Occupational Versatility program. This activity area, however, might be strengthened by some changes which could make it more attractive to the students. Consideration is being given to placing Career Guidance in a more visible place within the total shop facility, referencing careers to "Basic 10" plan sheets, adding sound loop films of careers and other attractive media, and generating school-wide awareness regarding career exploration. Further information regarding the Career Guidance activity area will be forthcoming in the addenda to this report, during the Summer of 1973.

Three corporations will be helping to facilitate national dissemination of Occupational Versatility. One of these will be concerned primarily with furnishings, facilities and program design; another with audio-visual media, particularly loop films; and the third with teacher training. The program staff will be working with these corporations to coordinate the dissemination efforts and assure responsible representation of the Occupational Versatility program.

Inservice classes, through Western Washington State College, will be continued. Six classes are already scheduled for Fall Quarter, 1972 and will encompass other disciplines in addition to industrial arts. The Occupational Versatility learning method exemplifies the currently advocated contemporary educational trends of individualization of instruction, criterion referenced objectives, personalized learning, ungraded scheduling, and responsible non-graded evaluation of student performance.

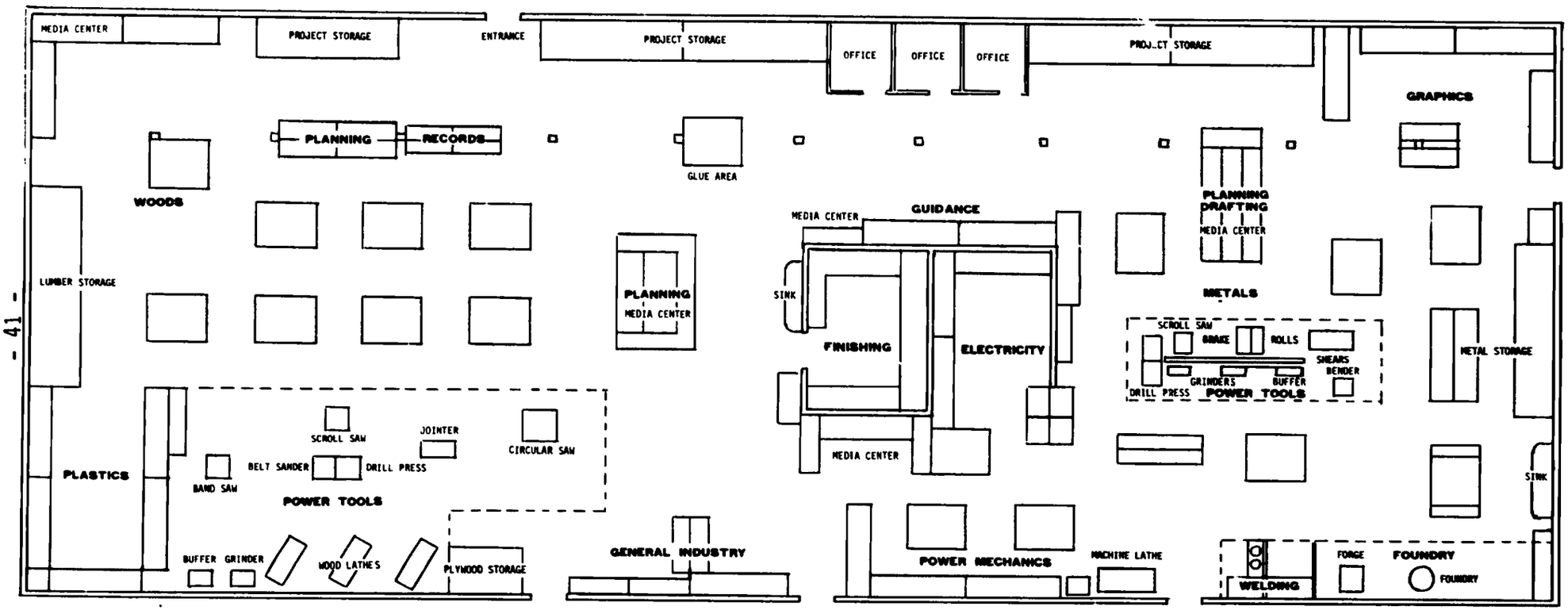
Recommendations

For the school districts who may desire to adopt Occupational Versatility, the following recommendations are advanced:

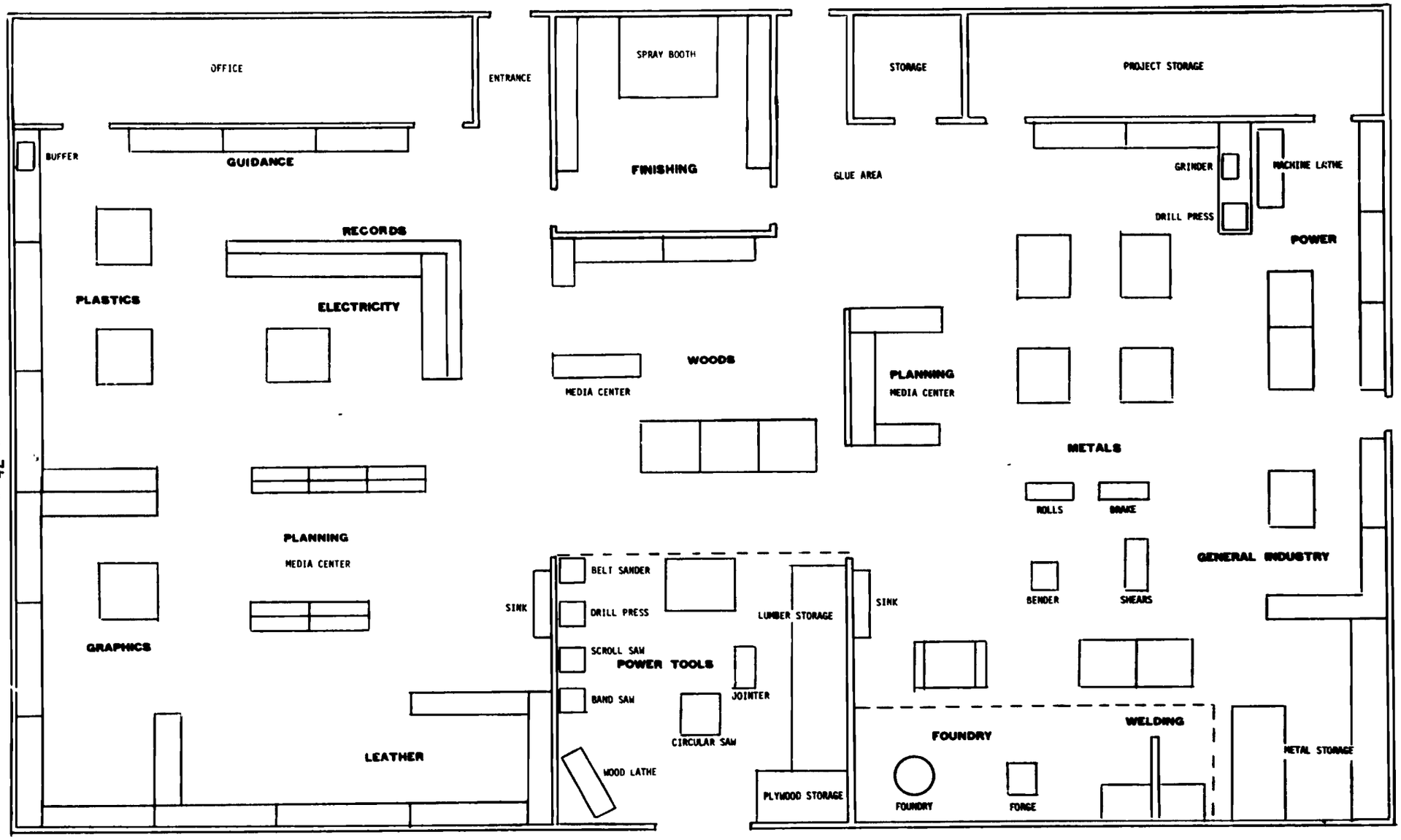
1. A financial and staff committment to the program should be made one full year in advance of the actual implementation.
2. A thorough working knowledge of the total Occupational Versatility program should be gained before attempting to adopt portions of the program.

3. Inservice training for those staff members who will be involved in implementing the program should be provided.
4. The Occupational Versatility learning method can be applied to other disciplines, particularly art, home and family living, and physical education.
5. This Occupational Versatility learning method can be applied to other grade levels (elementary and senior high school) through redesigning the program to objectives appropriate to these levels.

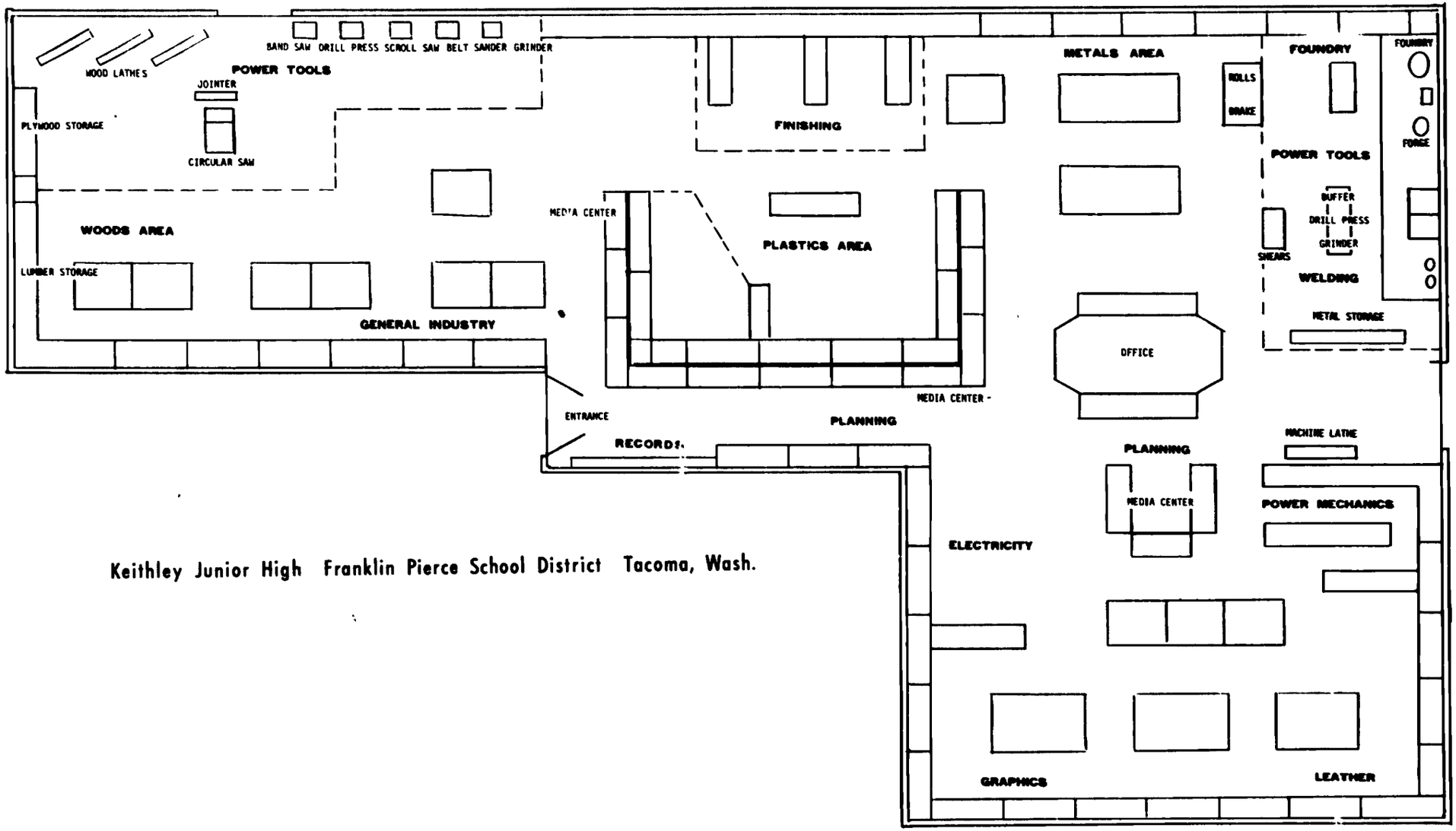
APPENDICES



Chinook Junior High Highline School District Seattle, Wash.



McKnight Middle School Renton School District Renton, Wash.



Keithley Junior High Franklin Pierce School District Tacoma, Wash.

ATTENDANCE AND TIME UTILIZATION

NAME ______________________________ PERIOD # ______ GRADE LEVEL ______ NOTEBOOK # ________

TEACHER NAME ______________________________

EXAMPLE: PRESENT, TARDY, SCHOOL VACATION, ABSENT, ABSENT (SCHOOL ACTIVITY)

ORIENTATION	PLAN	TURN	BOWL	PLAN	SIGN PRESS
1 2 3	V 7 8	9 10	13 14 15	A 16 17	20 21 22 23 24

1971 - 72

Month																									
SEPT.			1	2	3	6	7	8	9	10	13	14	15	16	17	20	21	22	23	24	27	28	29	30	
OCT.					1	4	5	6	7	8	11	12	13	14	15	18	19	20	21	22	25	26	27	28	29
NOV.	1	2	3	4	5	8	9	10	11	12	15	16	17	18	19	22	23	24	25	26	29	30			
DEC.			1	2	3	6	7	8	9	10	13	14	15	16	17	20	21	22	23	24	27	28	29	30	31
JAN.						3	4	5	6	7	10	11	12	13	14	17	18	19	20	21	24	25	26	27	28
FEB.		1	2	3	4	7	8	9	10	11	14	15	16	17	18	21	22	23	24	25	28	29			
MAR.			1	2	3	6	7	8	9	10	13	14	15	16	17	20	21	22	23	24	27	28	29	30	31
APR.						3	4	5	6	7	10	11	12	13	14	17	18	19	20	21	24	25	26	27	28
MAY	1	2	3	4	5	8	9	10	11	12	15	16	17	18	19	22	23	24	25	26	29	30	31		
JUNE				1	2	5	6	7	8																

ATTENDANCE RECORD

	DAYS PRESENT	DAYS ABSENT	% OF ATTENDANCE
6 WK.			
12 WK.			
18 WK.			
24 WK.			
30 WK.			
TOTAL			

REV. 8/19/71 (YELLOW)

MATERIAL COST RECORD

NAME ______________________ PERIOD # ______ GRADE LEVEL ________ NOTEBOOK # ________

DATE	MATERIAL OR PROJECT	DEBIT (MONEY SPENT)	CREDIT (MONEY PAID)	BALANCE (MONEY LEFT)
9/25/70	EXAMPLE: MATERIAL PAYMENT		1.50	1.50
9/26/70	CARVING PROJECT	.60		+.90
9/27/70	ABRASIVE CLOTH	.05		+.85

7/28/71

DATE	MATERIAL OR PROJECT	DEBIT (MONEY SPENT)	CREDIT (MONEY PAID)	BALANCE (MONEY LEFT)

(BLUE) 7/28/71

STUDENT PERFORMANCE RECORD

NAME _____ GRADE _____

SCHOOL _____ PERIOD _____

FILL IN THE CIRCLE AFTER YOU COMPLETE THE OPERATION

EXAMPLE: ● STEP BY STEP PROCEDURE

PLANNING

0 _____
0 SKETCHING
0 STEP BY STEP PROCEDURE
0 BILL OF MATERIALS
0 DIMENSIONING
0 ORTHOGRAPHIC (2 VIEW)
0 ISOMETRIC DRAWING
0 OBLIQUE DRAWING
0 CABINET DRAWING
0 PERPECTIVE DRAWING
0 SCHEMATIC DRAWING
0 LAYOUT DRAWING
0 DEVELOPMENT DRAWING
0 JIG DESIGNING & BUILDING
0 DRAWING INSTRUMENTS
0 TEMPLATE MAKING
0 ARCHITECTURAL DRAWING
0 ASSEMBLY DRAWING

STATIONARY EQUIPMENT

0 _____
0 ARC WELDER
0 BAND SAW
0 BENDER
0 BELT-DISC SANDER
0 BUFFER
0 COMBINATION ROTARY
0 DRILL PRESS
0 FORGE
0 FOUNDRY FURNACE
0 FORMING ROLLS
0 GRINDER
0 INJECTION MOLDER
0 JOINTER
0 METAL LATHE
0 MITER BOX SAW
0 OXYACETYLENE WELDER
0 OVEN
0 PAN BRAKE
0 PLATEN PRESS
0 POWER HACK SAW
0 ROTATIONAL MOLDER
0 SCROLL SAW
0 SHEAR
0 STRIP HEATER
0 SIGN PRESS
0 SOLDERING FURNACE
0 SPOT WELDER
0 TABLE SAW
0 VACUUM FORMER
0 WIRE WHEEL
0 WOOD LATHE

PORTABLE POWER TOOLS

0 _____
0 HOT WIRE KNIFE
0 HEAT GUN
0 BELT SANDER
0 CIRCULAR SAW
0 DRILL
0 SANDER VIBRATOR
0 ROUTER
0 SABER SAW
0 DISC SANDER
0 VIBRO TOOL ENGRAVER

HAND TOOL OPERATIONS

0 _____
0 BORING
0 CABINET SCRAPER
0 SANDING
0 CHISEL
0 MEASURING
0 PLANING
0 SAWING
0 SURFORM SHAPING
0 WOOD FILING

NAILS AND FASTENERS

0 _____
0 CORREGATED FASTENERS
0 HANGER BOLT
0 NAILS
0 WOOD SCREWS

GLUING PROCESSES AND JOINTS

0 _____
0 EDGE GLUING
0 FACE GLUING
0 LAMINATING OF VENEER
0 LAP
0 MITER
0 RABBET
0 BUTT
0 DADO
0 DOWEL

FINISHING

0 _____
0 POLISHING
0 BRUSHING
0 OIL FINISH
0 SEALING
0 SPRAYING
0 STAINING
0 WOOD FILLER

POWER MECHANICS

0 _____
0 ASSEMBLE 2 STROKE
0 ASSEMBLE 4 STROKE
0 CHECK COMPRESSION
0 REPLACE RINGS
0 CLEAN AND ADJUST BREAKER POINTS
0 CLEAN AND GAP PLUG
0 DISASSEMBLE 2 STROKE ENGINE
0 DRAIN AND REFILL CRANKCASE
0 LAP VALVES
0 TUNE UP SMALL ENGINE

POWER MECHANICS TOOLS

0 _____
0 FEELER GAUGE
0 RIDGE REAMER
0 RING COMPRESSOR
0 TORQUE WRENCH
0 COMPRESSION GAUGE
0 VALVE SPRING COMPRESSOR
0 WHEEL PULLER
0 MICROMETER

SHEET METAL

0 _____
0 FORMING
0 BENDING
0 CHASING
0 CUTTING
0 ETCHING
0 HEMMING
0 PATTERN LAYOUT
0 PEENING
0 RIVETING
0 ROLLING
0 SEAMING
0 SOLDERING
0 SPINNING

BENCH METALS

0 _____
0 COLD BENDING
0 CUTTING
0 DRILLING WITH CUTTING OIL
0 FILING
0 HOT BENDING
0 RIVETING
0 TAP AND DIE THREADING
0 TWISTING

FOUNDRY EXPERIENCES

0 _____
0 POURING ASSISTANT
0 PATTERN MAKING
0 SINGLE PATTERN CASTING
0 SPLIT PATTERN CASTING
0 STYROFOAM CASTING
0 MATCH PLATE

WELDING

0 _____
0 ARC
0 BRAZING
0 CUTTING
0 GAS - FUSION & ROD
0 SILVER SOLDERING
0 SPOT WELDING

PLASTICS

0 _____
0 ACRYLIC MEMORY
0 CASTING RESIN
0 EXPANDABLE POLYSTYRENE
0 FIBERGLASS LAMINATING
0 PLASTISOL DIP COATING
0 PRESS MOLDING

CRAFTS

0 _____
0 STAMPING
0 TOOLING LEATHER
0 COPPER ENAMEL
0 TOOLING FOIL
0 WOOD CARVING
0 CARVING LEATHER
0 DYING

GRAPHICS

0 _____
0 SIGN PRESS
0 PANTOGRAPH ENGRAVING
0 VIBRO TOOL ENGRAVING
0 CARVE AND PRINT LINOLEUM BLOCK
0 CUT STENCIL
0 ENGRAVE AND PRINT DRY POINT
0 PRINT STENCIL
0 SET RELIEF TYPE
0 SET TYPE FOR NAME STAMP
0 MARBLING
0 THERMOGRAPHY

ELECTRICITY

0 _____
0 BUILD A RUNNING MOTOR
0 DEVRY EXPLORER
0 KIT CONSTRUCTION
0 MCKNIGHT EXPERIMENTER
0 PARALLEL WIRING
0 SERIES WIRING
0 SOLDERED CONNECTIONS
0 VOLT-OHM METER
0 COIL CONSTRUCTION
0 LAB VOLT EXPERIENCES
0 PRINTED CIRCUIT
0 RADIO CIRCUITRY
0 HOUSE WIRING
0 HICKOCK

GENERAL INDUSTRY

0 _____
0 CASTING
0 TILE
0 CUT RAFTERS
0 FRAMED WALL
0 LAY BRICK & STONE
0 MIX CONCRETE
0 MIX MORTAR
0 PLUMBING
0 ROOFING
0 GLASS
0 DRYWALL
0 MODEL ASSEMBLY
0 MASS PRODUCTION
0 1/2 SCALE CORNER CONSTRUCTION
0 FULL SCALE CORNER CONSTRUCTION
0 SHED CONSTRUCTION

CAREER GUIDANCE

0 _____
0 OCCUPATION ANALYSIS

PLACE MARK WITH MONTH NUMBER PERIODICALLY

EXAMPLE: MY TIME IS VALUABLE SO I USE EVERY MINUTE

ALL OF THE TIME	MOST OF THE TIME	HALF OF THE TIME	SOME OF THE TIME	NONE OF THE TIME
6	10 12	3		

	ALL OF THE TIME	MOST OF THE TIME	HALF OF THE TIME	SOME OF THE TIME	NONE OF THE TIME
I HAVE A TEACHERS APPROVAL BEFORE OPERATING EQUIPMENT.					
I FIND THINGS THAT I WANT TO MAKE.					
I USE THE PLANNING SHEET IN THINKING THROUGH MY ACTIVITIES.					
I USE THE MEDIA PROVIDED IN THE SHOP.					
I LIKE TO MAKE PROJECTS OF MY OWN DESIGN.					
I COMPLETE PROJECTS THAT I START.					
MATERIALS COST MONEY SO I AM CAREFUL IN SELECTING PIECES THAT WILL ELIMINATE WASTE.					
MY TIME IS VALUABLE SO I USE EVERY MINUTE.					
I KNOW WHAT I'M CAPABLE OF DOING AND I WORK WITHIN THOSE LIMITS.					
I AM PROUD OF MY ACCOMPLISHMENTS IN THE SHOP.					
I HELP MY FELLOW STUDENTS WHEN THEY ASK ME TO.					
I ASK OTHER STUDENTS TO HELP ME WITH MY PROBLEMS.					
WHEN TEAMING WITH OTHER STUDENTS ON A PROJECT I DO MY SHARE.					
I LEAVE MY WORK AREA IN GOOD SHAPE FOR THE NEXT PERSON.					
IF I SEE AREAS THAT NEED CLEANING, I GO AHEAD AND CLEAN THEM.					

STUDENT PERFORMANCE OBSERVATION [illegible]

Student _____

Instructor _____

School _____

Evaluator _____

The above-named student is judged by mutual teacher and evaluator agreement in regard to student performance for the following three abilities.

Please place a cross (X) under the appropriate scale.

	Poor	Fair	Average	Good	Excellent
SELF-SUFFICIENT - The student has initiated and carried through to satisfaction of self and instructor, a project of his own choosing.					
PRODUCTIVE - The student has increased his efficiency in operation in the industrial arts facility as indicated by a decreasing amount of time spent on non productive activities and a decreased number of requests for assistance.					
ADAPTABLE - The student more readily accepts changes and deterents as indicated by a decreasing of waiting time between various task performance and a decrease in the number of requests for direction					

DATE ______________ PERIOD # ________

NAME: ____ STUDENT # ______________

LAST FIRST MIDDLE INITIAL

SCHOOL: ____ ______________

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE ______________

GRADE: 6 7 8 9 ______________

SEX: MALE FEMALE ______________

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS ______________

LISTED BELOW ARE FOURTEEN QUESTIONS ABOUT PLANNING FOR PROJECTS WHICH YOU MIGHT MAKE IN THE SHOP OR AT HOME. THERE ARE NO RIGHT OR WRONG ANSWERS FOR ANY QUESTIONS. YOU SHOULD SELECT THE ANSWER WHICH SHOWS WHAT YOU THINK ABOUT THAT QUESTION. ANSWER EACH QUESTION BY MAKING A CIRCLE AROUND THE NUMBER TO THE RIGHT WHICH SHOWS YOUR THINKING. BELOW ARE TWO SAMPLE QUESTIONS:

SAMPLE QUESTIONS

WHEN YOU ARE COACHING A FOOTBALL TEAM, HOW IMPORTANT DO YOU THINK IT IS--	NOT IMPORTANT AT ALL			MODERATELY IMPORTANT			VERY IMPORTANT
A. TO HAVE THE PLAYERS PRACTICE BLOCKING?	1	2	3	4	(5)	6	7
B. TO HAVE THE PLAYERS PRACTICE KICKING?	1	2	(3)	4	5	6	7

ANSWER EACH QUESTION. SHOW WHAT YOU THINK BY MAKING A CIRCLE AROUND ONE OF THE NUMBERS FROM "NOT IMPORTANT AT ALL" TO "VERY IMPORTANT."

* *

WHEN YOU ARE GOING TO MAKE A PROJECT IN THE SHOP, HOW IMPORTANT DO YOU THINK IT IS --

	NOT IMPORTANT AT ALL			MODERATELY IMPORTANT			VERY IMPORTANT
1. TO MAKE A DRAWING OF WHAT THE PROJECT SHOULD LOOK LIKE?	1	2	3	4	5	6	7

GIVE ANY REASONS YOU CAN THINK OF FOR ANSWERING THE WAY YOU DID: ______________

____

____

2. TO PUT THE MEASUREMENTS FOR THE PROJECT ON YOUR DRAWING (IF YOU MAKE ONE)?	1	2	3	4	5	6	7

____

____

____

WHEN YOU ARE GOING TO MAKE A PROJECT IN THE SHOP, HOW IMPORTANT DO YOU THINK IT IS TO --	NOT IMPORTANT AT ALL			MODERATELY IMPORTANT			VERY IMPORTANT
3. TO MAKE A LIST OF THE MATERIALS YOU WILL NEED IN YOUR WORK?	1	2	3	4	5	6	7
4. TO FIGURE OUT THE COST OF ALL THE MATERIALS YOU WILL BE USING?	1	2	3	4	5	6	7
5. TO MAKE A LIST OF THE TOOLS AND EQUIPMENT YOU WILL NEED TO USE IN YOUR WORK?	1	2	3	4	5	6	7
6. TO GET INFORMATION ON HOW TO DO IT?	1	2	3	4	5	6	7
7. TO PLAN EVERYTHING YOU MUST DO ON THE PROJECT, BEFORE YOU BEGIN WORKING ON IT?	1	2	3	4	5	6	7

WHEN YOU ARE GOING TO MAKE A PROJECT AT <u>HOME</u>, HOW IMPORTANT DO YOU THINK IT IS --

8. TO DRAW A PICTURE OF WHAT THE PROJECT SHOULD LOOK LIKE?	1	2	3	4	5	6	7

	NOT IMPORTANT AT ALL			MODERATELY IMPORTANT			VERY IMPORTANT

WHEN YOU ARE GOING TO MAKE A PROJECT AT HOME, HOW IMPORTANT DO YOU THINK IT IS --

9. TO WRITE THE MEASUREMENTS FOR THE PROJECT ON YOUR PICTURE (IF YOU DRAW ONE)?	1	2	3	4	5	6	7
10. TO MAKE A LIST OF THE MATERIALS YOU WILL NEED IN YOUR WORK?	1	2	3	4	5	6	7
11. TO FIGURE OUT THE COST OF ALL THE MATERIALS YOU WILL BE USING?	1	2	3	4	5	6	7
12. TO MAKE A LIST OF THE TOOLS AND EQUIPMENT YOU WILL NEED TO USE IN YOUR WORK?	1	2	3	4	5	6	7
13. TO GET INFORMATION ON HOW TO DO IT?	1	2	3	4	5	6	7
14. TO PLAN EVERYTHING YOU MUST DO ON THE PROJECT, BEFORE YOU BEGIN WORKING ON IT?	1	2	3	4	5	6	7

DATE _____ PERIOD #_____

NAME: _____ STUDENT # _____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE

GRADE: 6 7 8 9

SEX: MALE FEMALE

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS

LISTED BELOW ARE TWENTY QUESTIONS ON HOW YOU FEEL ABOUT PLANNING PROJECTS. THERE ARE NO RIGHT OR WRONG ANSWERS FOR ANY QUESTIONS. YOU SHOULD SELECT THE ANSWER WHICH REFLECTS HOW YOU FEEL ABOUT THAT QUESTION. ANSWER EACH QUESTION BY MAKING A CIRCLE AROUND THE NUMBER TO THE RIGHT WHICH SHOWS HOW YOU FEEL ABOUT THAT QUESTION. BELOW ARE TWO SAMPLE QUESTIONS:

SAMPLE QUESTIONS HOW DO YOU FEEL ABOUT --	DISLIKE VERY MUCH			DON'T LIKE OR DISLIKE			LIKE VERY MUCH
A. GOING TO SCHOOL?	1	2	3	4	(5)	6	7
B. MOWING THE LAWN?	1	2	(3)	4	5	6	7

NOW ANSWER THE FOLLOWING QUESTIONS. SHOW HOW YOU FEEL BY MAKING A CIRCLE AROUND ONE OF THE NUMBERS FROM "DISLIKE VERY MUCH" TO "LIKE VERY MUCH."

* *

HOW DO YOU FEEL ABOUT --	DISLIKE VERY MUCH			DON'T LIKE OR DISLIKE			LIKE VERY MUCH
1. PLANNING YOUR PROJECTS IN THE SHOP BEFORE YOU BEGIN WORKING ON THEM?	1	2	3	4	5	6	7
2. PLANNING YOUR PROJECTS AT HOME BEFORE YOU BEGIN WORKING ON THEM?	1	2	3	4	5	6	7
3. MAKING A DRAWING THAT SHOWS WHAT YOUR PROJECT SHOULD LOOK LIKE?	1	2	3	4	5	6	7
4. PUTTING DIMENSIONS ON THE DRAWING OF A PROJECT YOU ARE GOING TO MAKE IN THE SHOP?	1	2	3	4	5	6	7
5. MAKING A LIST OF THE MATERIALS YOU WILL NEED TO MAKE YOUR PROJECT?	1	2	3	4	5	6	7

HOW DO YOU FEEL ABOUT --	DISLIKE VERY MUCH			DON'T LIKE OR DISLIKE			LIKE VERY MUCH
6. FIGURING OUT THE COST OF THE MATERIALS YOU WILL NEED TO MAKE YOUR PROJECT?	1	2	3	4	5	6	7
7. GETTING HELP FROM YOUR FRIENDS AND CLASSMATES IN PLANNING A PROJECT?	1	2	3	4	5	6	7
8. FINDING OUT WHAT TOOLS AND EQUIPMENT YOU WILL NEED TO MAKE YOUR PROJECT?	1	2	3	4	5	6	7
9. LOOKING THROUGH SETS OF PLANS TO FIND A PROJECT YOU WOULD LIKE TO MAKE?	1	2	3	4	5	6	7
10. LOOKING AT FILMS AND MOVIES TO FIND OUT HOW TO MAKE A PROJECT?	1	2	3	4	5	6	7
11. HAVING YOUR TEACHER HELP YOU WHEN YOU ARE PLANNING A PROJECT?	1	2	3	4	5	6	7
12. FIGURING OUT HOW MUCH MONEY IT WILL COST TO MAKE A PROJECT?	1	2	3	4	5	6	7
13. READING BOOKS AND MAGAZINES TO GET INFORMATION ABOUT HOW TO MAKE A PROJECT?	1	2	3	4	5	6	7
14. PLANNING AS A PART OF THE WORK YOU DO IN THE SHOP?	1	2	3	4	5	6	7
15. FINDING OUT WHAT MATERIALS YOU WILL NEED BEFORE YOU BEGIN WORKING?	1	2	3	4	5	6	7
16. FINDING OUT WHAT TOOLS AND EQUIPMENT YOU WILL NEED TO USE BEFORE YOU BEGIN WORKING ON A PROJECT?	1	2	3	4	5	6	7
17. PLANNING A PROJECT CAREFULLY BEFORE YOU BEGIN WORKING ON IT?	1	2	3	4	5	6	7
18. FINDING OUT HOW MUCH ALL THE MATERIALS WILL COST BEFORE YOU BEGIN WORKING ON A PROJECT?	1	2	3	4	5	6	7
19. STUDYING THE PLANS FOR A PROJECT BEFORE YOU BEGIN WORKING ON IT?	1	2	3	4	5	6	7
20. HOW DO YOU FEEL ABOUT WORKING ON A PROJECT AFTER YOU HAVE DONE CAREFUL PLANNING?	1	2	3	4	5	6	7

NOTEBOOK #: _____

DATE: _____

PERIOD: _____

NAME: _____ STUDENT # _____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____

DISTRICT: HIGHLINE RENTON FRANKLIN-PIERCE _____

GRADE: 6 7 8 9 _____

SEX: MALE FEMALE _____

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS _____

LISTED BELOW ARE SIX QUESTIONS WHICH ARE CONCERNED WITH YOUR SATISFACTION IN MAKING A PROJECT. THERE ARE NO RIGHT OR WRONG ANSWERS FOR ANY QUESTIONS. YOU SHOULD SELECT THE ANSWER WHICH SHOWS WHAT YOU FEEL ABOUT THAT QUESTION. ANSWER EACH QUESTION BY MAKING A CIRCLE AROUND THE NUMBER TO THE RIGHT WHICH REFLECTS HOW YOU FEEL ABOUT THAT QUESTION. BELOW ARE TWO SAMPLE QUESTIONS:

SAMPLE QUESTIONS	VERY UNSATISFIED						VERY SATISFIED
HOW DO YOU FEEL ABOUT --							
A. THE WAY YOU PLAY FOOTBALL?	1	2	3	4	(5)	6	7
B. THE WAY YOU SING?	1	2	(3)	4	5	6	7

NOW ANSWER THE FOLLOWING QUESTIONS. SHOW HOW YOU FEEL BY MAKING A CIRCLE AROUND ONE OF THE NUMBERS FROM "VERY UNSATISFIED" TO "VERY SATISFIED."

* *

HOW DO YOU FEEL ABOUT ___	VERY UNSATISFIED						VERY SATISFIED
1. THE WAY YOU PLANNED YOUR PROJECT?	1	2	3	4	5	6	7
2. YOUR CHOICE OF MATERIALS IN MAKING YOUR PROJECT?	1	2	3	4	5	6	7
3. THE WAY YOU USED TOOLS AND EQUIPMENT WHEN YOU WERE MAKING YOUR PROJECT?	1	2	3	4	5	6	7
4. HOW HARD YOU WORKED IN MAKING YOUR PROJECT?	1	2	3	4	5	6	7
5. THE QUALITY OF YOUR PROJECT, NOW THAT YOU HAVE FINISHED IT?	1	2	3	4	5	6	7
HOW DO YOU THINK --							
6. YOUR TEACHERS FEEL ABOUT THE QUALITY OF YOUR PROJECT?	1	2	3	4	5	6	7

ON QUESTIONS 7 THROUGH 12, WRITE YOUR ANSWER ON THE LINES PROVIDED.

7. WHAT PROJECT DID YOU JUST COMPLETE?

_____

8. WHICH AREA OF THE SHOP WAS THIS PROJECT FROM?

_____

9. HAVE YOU MADE OTHER PROJECTS IN THIS AREA OF THE SHOP?

_____

10. WHAT DO YOU FEEL YOU <u>DID WELL</u> ON THIS PROJECT? _____

_____

_____

_____

11. WHAT DO YOU FEEL YOU <u>DID NOT DO WELL</u> ON THIS PROJECT? _____

_____

_____

_____

12. WHAT WOULD YOU DO DIFFERENTLY IF YOU WERE GOING TO DO THIS SAME PROJECT AGAIN? _____

_____

_____

_____

PUT A (✓) IN THE BLANK BY YOUR ANSWER ON QUESTIONS 13 & 14.

13. DID YOU USE A "BASIC 10" PLAN OR DID YOU DRAW UP YOUR OWN PLAN?

_____ BASIC 10 PLAN _____ OWN PLAN

14. ARE YOU INTERESTED IN STARTING ON ANOTHER PROJECT VERY SOON?

_____ YES _____ UNDECIDED _____ NO

SATISFACTION
INDEX

INSTRUCTOR: _____

STUDENT: _____ NOTEBOOK # _____

DATE: _____ PERIOD: _____

PROJECT: _____

PLEASE ANSWER THE FOLLOWING QUESTIONS. SHOW HOW YOU FEEL BY MAKING A CIRCLE AROUND ONE OF THE NUMBERS FROM "VERY UNSATISFIED" TO "VERY SATISFIED."

HOW DO YOU FEEL ABOUT --	VERY UNSATISFIED						VERY SATISFIED
1. THE WAY THE STUDENT PLANNED THIS PROJECT?	1	2	3	4	5	6	7
2. THE STUDENT'S CHOICE OF MATERIALS IN MAKING THIS PROJECT?	1	2	3	4	5	6	7
3. THE WAY THE STUDENT USED TOOLS AND EQUIPMENT IN MAKING THIS PROJECT?	1	2	3	4	5	6	7
4. HOW HARD THE STUDENT WORKED IN MAKING THIS PROJECT?	1	2	3	4	5	6	7
5. THE QUALITY OF THE STUDENT'S FINISHED PROJECT?	1	2	3	4	5	6	7
6. HOW DO YOU THINK THE STUDENT FEELS ABOUT THE QUALITY OF HIS PROJECT?	1	2	3	4	5	6	7

10. LIST ONE THING THE STUDENT <u>DID WELL</u> ON THIS PROJECT. _____

_____

_____

_____

11. LIST ONE THING THE STUDENT <u>DID NOT DO WELL</u> ON THIS PROJECT. _____

_____

_____

_____

DATE _____ PERIOD #_____

NAME: _____ STUDENT#_____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE

GRADE: 6 7 8 9

SEX: MALE FEMALE

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS

LISTED BELOW ARE NINETEEN QUESTIONS WHICH ASK HOW YOU FEEL ABOUT SELF-INSTRUCTION. THERE ARE NO RIGHT OR WRONG ANSWERS FOR ANY QUESTIONS. YOU SHOULD SELECT THE ANSWER WHICH SHOWS HOW YOU FEEL ABOUT THAT QUESTION. ANSWER EACH QUESTION BY MAKING A CIRCLE AROUND THE NUMBER TO THE RIGHT WHICH SHOWS YOUR FEELINGS. BELOW ARE TWO SAMPLE QUESTIONS:

SAMPLE QUESTIONS HOW DO YOU FEEL ABOUT --	DISLIKE VERY MUCH			DON'T LIKE OR DISLIKE			LIKE VERY MUCH
A. GOING TO FOOTBALL GAMES?	1	2	3	4	(5)	6	7
B. WORKING DURING SUMMER VACATION?	1	2	(3)	4	5	6	7

NOW ANSWER THE FOLLOWING QUESTIONS. SHOW HOW YOU FEEL BY MAKING A CIRCLE AROUND ONE OF THE NUMBERS FROM "DISLIKE VERY MUCH" TO "LIKE VERY MUCH."

* * * * * * * * * * * * * * * * * * * *

HOW DO YOU FEEL ABOUT --	DISLIKE VERY MUCH			DON'T LIKE OR DISLIKE			LIKE VERY MUCH
1. TEACHING YOURSELF, RATHER THAN BEING TAUGHT BY A TEACHER?	1	2	3	4	5	6	7
2. TEACHING YOURSELF BY GETTING INFORMATION FROM YOUR FRIENDS AND CLASSMATES?	1	2	3	4	5	6	7
3. TEACHING YOURSELF BY USING FILM LOOPS AND MOVIES IN THE SHOP?	1	2	3	4	5	6	7
4. TEACHING YOURSELF BY USING THE "BASIC 10" PLAN SHEETS AND MODELS OF PROJECTS?	1	2	3	4	5	6	7
5. SELF-INSTRUCTION (TEACHING YOURSELF) AS A WAY TO LEARN?	1	2	3	4	5	6	7
6. THE FREEDOM OF CHOICE THAT YOU HAVE TEACHING YOURSELF IN THE SHOP?	1	2	3	4	5	6	7

HOW DO YOU FEEL ABOUT --	DISLIKE VERY MUCH			DON'T LIKE OR DISLIKE			LIKE VERY MUCH
7. TAKING RESPONSIBILITY FOR TEACHING YOURSELF AND LEARNING IN THE SHOP?	1	2	3	4	5	6	7
8. TEACHING YOURSELF BY USING THE BOOKS AND MAGAZINES AVAILABLE IN THE SHOP?	1	2	3	4	5	6	7
9. NOT HAVING A TEACHER TEACH YOU IN THE SHOP?	1	2	3	4	5	6	7
10. SELF-INSTRUCTION (TEACHING YOURSELF) AS A WAY TO LEARN THINGS?	1	2	3	4	5	6	7
11. TEACHING YOURSELF THINGS YOU WANT TO LEARN ABOUT WHEN YOU ARE NOT IN SCHOOL?	1	2	3	4	5	6	7
12. SELF-INSTRUCTION (TEACHING YOURSELF) AS A WAY TO LEARN IN YOUR OTHER CLASSES?	1	2	3	4	5	6	7
13. DOING MOST OF YOUR LEARNING IN THE SHOP WITHOUT HAVING A TEACHER TEACH YOU?	1	2	3	4	5	6	7
14. LEARNING WHEN YOU TEACH YOURSELF?	1	2	3	4	5	6	7
15. LEARNING WHEN A TEACHER DOES NOT TEACH YOU?	1	2	3	4	5	6	7
16. TAKING THE RESPONSIBILITY FOR TEACHING YOURSELF?	1	2	3	4	5	6	7
17. SELF-INSTRUCTION GIVING YOU A CHANCE TO LEARN WHAT YOU REALLY WANT TO KNOW?	1	2	3	4	5	6	7
HOW WOULD YOU FEEL ABOUT --							
18. TEACHING YOURSELF IN OTHER CLASSES?	1	2	3	4	5	6	7
19. TAKING SHOP THIS YEAR IF YOU DIDN'T HAVE TO TEACH YOURSELF?	1	2	3	4	5	6	7

DATE _____ PERIOD #_____

NAME: _____ STUDENT # _____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____ _____

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE _____

GRADE: 6 7 8 9 _____

SEX: MALE FEMALE _____

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS _____

1. PLEASE RANK THE FOLLOWING INFORMATION RESOURCES. THE ONE YOU USE MOST OFTEN SHOULD BE MARKED 1, THE ONE YOU USE NEXT MOST OFTEN SHOULD BE MARKED 2, ETC.

_____ TEACHER

_____ FILM LOOPS (MOVIES)

_____ FILMSTRIPS

_____ BOOKS

_____ MAGAZINES

_____ CASSETTE TAPES

_____ OTHER STUDENTS

_____ INSTRUCTION SHEETS (BASIC 10)

_____ _____(OTHER)

2. DO YOU FIND THAT YOU ARE ABLE TO GET THE INFORMATION YOU NEED WHEN YOU ARE WORKING ON YOUR PROJECTS?

NEVER			SOMETIMES			ALWAYS
1	2	3	4	5	6	7

3. CAN YOU THINK OF ANY CHANGES THAT COULD BE MADE IN THE ORGANIZATION OF THE SHOP, SO THAT YOU COULD GET INFORMATION MORE EASILY WHEN YOU ARE WORKING ON YOUR PROJECTS?

_____

_____

_____

_____

_____

DATE _____ PERIOD # _____

CAREER GUIDANCE FORM

NAME: _____ STUDENT # _____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE

GRADE: 6 7 8 9

SEX: MALE FEMALE

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS

NAME OF CAREER YOU HAVE JUST EXPLORED IS: _____

1. WHAT EDUCATION IS NECESSARY FOR THIS CAREER? (CHECK APPLICABLE AREAS). JR. HIGH _____
HIGH SCHOOL _____ APPRENTICESHIP _____ TECHNICAL INSTITUTE _____
TRADE SCHOOL _____ COMMUNITY COLLEGE _____ JUNIOR COLLEGE _____
COLLEGE OR UNIVERSITY _____.

2. IF THE CAREER SUGGESTS POST HIGH SCHOOL TRAINING, WHERE CAN YOU GET IT?
(LIST) _____

_____

3. WHAT WOULD BE THE LENGTH OF TRAINING REQUIRED? _____

_____

4. HOW COULD THE COST OF THIS TRAINING BE FINANCED? _____

_____

_____

5. DOES THIS TRAINING CONSIST OF:

_____ ON THE-JOB EXPERIENCE

_____ CLASSROOM STUDY

_____ BOTH ON-THE-JOB EXPERIENCE AND CLASSROOM STUDY.

(OVER)

6. WHAT ELECTIVES ARE RECOMMENDED IN HIGH SCHOOL TO PREPARE FOR THIS CAREER?
(LIST) _____

_____

_____

7. WHAT IS THE EMPLOYMENT OUTLOOK? (LOOK IN THE OCCUPATIONAL OUTLOOK HANDBOOK; WASHINGTON STATE OCCUPATIONAL GUIDES.) CHECK ONE OF THE FOLLOWING:
POOR _____ FAIR _____ GOOD _____ EXCELLENT _____

8. WHAT ARE THE WORKING CONDITIONS? (LOOK IN THE OCCUPATIONAL OUTLOOK HANDBOOK; WASHINGTON STATE OCCUPATIONAL GUIDES; AND USE FILMS AND TAPES, AS AVAILABLE.)
   (A) IS IT INSIDE _____ OR OUTSIDE? _____ OR BOTH _____
   (B) IS IT A DESK JOB _____ OR ARE YOU ON YOUR FEET? _____ OR BOTH _____
   (C) DO YOU WORK ALONE _____ OR WITH PEOPLE? _____ OR BOTH _____
   (D) IS IT LIGHT WORK _____ OR HEAVY WORK? _____
   (E) DO YOU NEED TO BE ABLE TO WRITE WELL? _____
   (F) IS THERE A LOT OF FIGURING (MATH)? _____
   (G) DO YOU HAVE TO TALK WITH PEOPLE A LOT? _____
   (H) WHAT IS THE AVERAGE SALARY? _____
   (I) WHAT ARE THE OPPORTUNITIES FOR ADVANCEMENT? _____
   (J) IS IT SEASONAL _____ OR ALL YEAR? _____

9. IS THERE A MOVIE AVAILABLE IN THE CAREER GUIDANCE AREA FOR THIS CAREER?
YES _____ NO _____
   DID YOU USE THIS MOVIE? YES _____ NO _____

10. IS THERE A TAPE AVAILABLE IN THE CAREER GUIDANCE AREA FOR THIS CAREER?
YES _____ NO _____
   DID YOU USE THIS TAPE? YES _____ NO _____
   DID YOU LEARN ANYTHING FROM THE TAPE THAT WASN'T AVAILABLE FROM THE OTHER SOURCES YOU LOOKED AT? YES _____ NO _____

   IF YOU ANSWERED "YES", PLEASE NAME ONE THING THAT YOU LEARNED _____

   _____

11. DOES THIS CAREER INTEREST YOU?
   NO _____ SOMEWHAT _____ YES _____

PLEASE SIGN THE CAREER GUIDANCE USER'S LIST, WITH YOUR NAME AND PERIOD AND NOTEBOOK NUMBER. THEN, PLEASE FILE THIS FORM IN YOUR STUDENT NOTEBOOK. THANK YOU!

QUARTER CHECK-OUT

Chinook Junior High

Name: _____

Notebook#: _____

Sex: M F

Grade: 7

Period: _____

(1) Please put a check (✓) by all the areas where you made a project. Please put a circle (0) by all the areas that you know how to work in, even though you did not make a project there.

	MADE A PROJECT	KNOW HOW TO WORK IN
WOODS		
PLASTICS		
GRAPHICS		
CRAFTS		
POWER MECHANICS		
METALS		
WELDING		
FORGING (FOUNDRY)		
ELECTRICITY/ELECTRONICS		
CAREER GUIDANCE		
PLANNING (DRAFTING)		
GENERAL INDUSTRIES		
(OTHER)		

(2) During this quarter you have worked in the shop for 9 weeks. Was this too short, too long, or just the right length of time for you to do the work you wanted to in the shop? (Put a check (✓) after the way you feel).

9 weeks is just right _____
9 weeks is too short, we should have a longer time _____
9 weeks is too long, we should have a shorter time _____

(3) You had plans that you used to make projects in the shop. Were these plans you used during your 9 weeks in the shop: (Put a check (✓) after your answer).

Shop plan sheets only _____
Shop plan sheets and own plans _____
Own plans only _____

(5) You were able to find information, which you needed, many different ways in the shop. Please number the following ways of getting information, according to how much you used them: (if you did not use an information source, put an "X" in the blank in front of it).

_____ cassette tapes
_____ magazines
_____ movies
_____ other students
_____ plan sheets (shop plans)
_____ filmstrips & slides
_____ teacher
_____ books
_____ my own ideas

(6) How many projects did you make during your 9 weeks in the shop? _____

(7) About how much money did you spend in the shop? _____

(8) Would you like to take shop again next year? Yes _____ Maybe _____ No _____

(9) Did you use the career guidance area? Yes _____ No _____

(10) Do you know what career you will go into when you finish school and enter the world of work? Put a check (✓) mark after your answer.

Yes; I know for sure _____
Yes; I think I know _____
Maybe; I have some ideas _____
Not really; I'm not sure _____
No; I don't know _____

(11) What career(s) are you interested in? _____

_____

_____

(12) Do you know what skills you will need to work in these career(s)?

Yes; I know for sure _____
Yes; I think I know _____
Maybe; I have some ideas _____
Not really; I'm not sure _____
No; I don't know _____

(13) Do you know what you should learn in school to help you prepare for these career(s)?

Yes; I know for sure _____
Yes; I think I know _____
Maybe; I have some ideas _____
Not really; I'm not sure _____
No; I don't know _____

DATE _____ PERIOD # _____

NAME: _____ STUDENT # _____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE

GRADE: 6 7 8 9

SEX: MALE FEMALE

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS

Listed below are various statements that students sometimes make about school, about thinking, and about themselves. You may find that you agree with a statement or even strongly agree with it. Or you may disagree or strongly disagree. Or sometimes you may be undecided whether you agree or disagree.

Read each statement carefully and then draw a circle around one of the symbols after it. This is what the symbols mean:

SA means you strongly agree

A means you agree

? means you are undecided

D means you disagree

SD means you strongly disagree

1.	Most problems have only one good way to be solved.	SA	A	?	D	SD
2.	I often make up my mind too quickly about the answer to a problem.	SA	A	?	D	SD
3.	There is not enough work in school that makes you think up ideas of your own.	SA	A	?	D	SD
4.	When I don't understand something in class, I avoid asking questions about it.	SA	A	?	D	SD
5.	Ideas that don't solve the problem can't help to put you on the right track.	SA	A	?	D	SD
6.	I like science and mathematics.	SA	A	?	D	SD
7.	Students like the kinds of problems that nobody, presently in class, knows the answer to.	SA	A	?	D	SD
8.	My ideas for solving problems are about as good as those given by others in the class.	SA	A	?	D	SD
9.	History is mostly just learning facts; you don't have to think things through for yourself when you study history.	SA	A	?	D	SD

10.	When I'm trying to solve a problem, I often know how to get started on it.	SA	A	?	D	SD
11.	Some students are just naturally poorer thinkers than others.	SA	A	?	D	SD
12.	Most of the students in my class are better at solving problems than I am.	SA	A	?	D	SD
13.	Students are eager to learn.	SA	A	?	D	SD
14.	When I am working on a problem, I usually like to get my ideas from other students.	SA	A	?	D	SD
15.	If you don't have any good ideas after working a while on a problem, you are not likely to get any that will work.	SA	A	?	D	SD
16.	When I work on problems, I often find I haven't paid attention to some important fact.	SA	A	?	D	SD
17.	Students often make the same kind of mistakes over and over again in solving problems.	SA	A	?	D	SD
18.	I would usually rather work on problems I know I can solve than on ones that may be too hard for me.	SA	A	?	D	SD
19.	Students like to work on problems like mysteries and puzzles that make them think.	SA	A	?	D	SD
20.	I usually don't get rattled and confused when I am trying to think.	SA	A	?	D	SD
21.	Problems are fair if they make you keep looking for new ideas in order to solve them.	SA	A	?	D	SD
22.	I am less interested in getting the right answer than in knowing how to get it.	SA	A	?	D	SD
23.	When you are working on a problem it is best to keep away from poor ideas because they may throw you off the right track.	SA	A	?	D	SD
24.	I often keep my ideas to myself because I think others may laugh at them.	SA	A	?	D	SD
25.	It is best to make very sure that an idea is a good one before suggesting it to the class.	SA	A	?	D	SD
26.	I often have an idea for an answer which I don't tell because I am afraid it may be wrong.	SA	A	?	D	SD

27.	Students like problems where they aren't told just <u>exactly</u> what the problem is.	SA	A	?	D	SD
28.	I am able to get unusual ideas -- ideas that the other students don't often think of.	SA	A	?	D	SD
29.	Ideas just seem to "come to you"; there isn't any way of <u>learning</u> how to get more ideas.	SA	A	?	D	SD
30.	My ideas and suggestions are often not taken seriously by anyone in class.	SA	A	?	D	SD
31.	Students usually find it hard to decide whether an idea is a good one or not.	SA	A	?	D	SD
32.	I am very curious about unexplained things around me and want to try to understand them.	SA	A	?	D	SD
33.	Students like the kinds of problems that have more than one right answer.	SA	A	?	D	SD
34.	I think I have the makings of a really creative thinker.	SA	A	?	D	SD

DATE _____ PERIOD # ____

NAME: _____ STUDENT # _____
LAST FIRST MIDDLE INITIAL

SCHOOL: _____

DISTRICT: HIGHLINE RENTON FRANKLIN PIERCE

GRADE: 6 7 8 9

SEX: MALE FEMALE

PREVIOUS SHOP EXPERIENCE: 0 YEARS 1 YEAR 2 YEARS

GENERAL DIRECTIONS: This questionnaire describes a number of common experiences most of you have in your daily lives. These statements are presented one at a time, and following each are two possible answers. Read the description of the experience carefully, and then look at the two answers. Choose the one that most often describes what happens to you. Put a circle around the "A" or the "B" in front of that answer. Be sure to answer each question according to how you really feel.

If, at any time, you are uncertain about the meaning of a question, raise your hand and one of the persons who passed out the questionnaires will come and explain it to you.

1. If a teacher passes you to the next grade, would it probably be
   A. because she liked you, or
   B. because of the work you did?

2. When you do well on a test at school, is it more likely to be
   A. because you studied for it, or
   B. because the test was especially easy?

3. When you have trouble understanding something in school, is it usually
   A. because the teacher didn't explain it clearly, or
   B. because you didn't listen carefully?

4. When you read a story and can't remember much of it, is it usually
   A. because the story wasn't well written, or
   B. because you weren't interested in the story?

5. Suppose your parents say you are doing well in school. Is this likely to happen
   A. because your school work is good, or
   B. because they are in a good mood?

6. Suppose you did better than usual in a subject at school. Would it probably happen
   A. because you tried harder, or
   B. because someone helped you?

7. When you lose at a game of cards or checkers, does it usually happen
   A. because the other player is good at the game, or
   B. because you don't play well?

8. Suppose a person doesn't think you are very bright or clever,
   A. can you make him change his mind if you try to, or
   B. are there some people who will think you're not very bright no matter what you do?

9. If you solve a puzzle quickly, is it
   A. because it wasn't a very hard puzzle, or
   B. because you worked on it carefully?

10. If a boy or girl tells you that you are dumb, is it more likely that they say that
   A. because they are mad at you, or
   B. because what you did really wasn't very bright?

11. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
   A. because you didn't work hard enough, or
   B. because you needed some help, and other people didn't give it to you?

12. When you learn something quickly in school, is it usually
   A. because you paid close attention, or
   B. because the teacher explained it clearly?

13. If a teacher says to you, "Your work is fine," is it
   A. something teachers usually say to encourage pupils, or
   B. because you did a good job?

14. When you find it hard to work arithmetic or math problems at school, is it
   A. because you didn't study well enough before you tried them, or
   B. because the teacher gave problems that were too hard?

15. When you forget something you heard in class, is it
   A. because the teacher didn't explain it very well, or
   B. because you didn't try very hard to remember?

16. Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right, is it likely to happen
   A. because she wasn't as particular as usual, or
   B. because you have the best answer you could think of?

17. When you read a story and remember most of it, is it usually
   A. because you were interested in the story, or
   B. because the story was well written?

18. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
   A. because of something you did, or
   B. because they happen to feel cranky?

19. When you don't do well on a test at school, is it
   A. because the test was especially hard, or
   B. because you didn't study for it?

20. When you win at a game of cards or checkers, does it happen
   A. because you play real well, or
   B. because the other person doesn't play well?

21. If people think you're bright or clever, is it
   A. because they happen to like you, or
   B. because you usually act that way?

22. If a teacher didn't pass you to the next grade, would it probably be
    A. because she "had it in for you", or
    B. because your school work wasn't good enough?

23. Suppose you don't do as well as usual in a subject at school. Would this probably happen
    A. because you weren't as careful as usual, or
    B. because somebody bothered you and kept you from working?

24. If a boy or girl tells you that you are bright, is it usually
    A. because you thought up a good idea, or
    B. because they like you?

25. Suppose you became a famous teacher, scientist, or doctor. Do you think this would happen
    A. because other people helped you when you needed it, or
    B. because you worked very hard?

26. Suppose your parents say you aren't doing well in your school work. Is this likely to happen
    A. because your work isn't very good, or
    B. because they are feeling cranky?

27. Suppose you are showing a friend how to play a game and he has trouble with it. Would this happen
    A. because he wasn't able to understand how to play, or
    B. because you couldn't explain it well?

28. When you find it easy to work arithmetic or math problems at school, is it usually
    A. because the teacher gave you especially easy problems, or
    B. because you studied your book well before you tried them?

29. When you remember something you heard in class, is it usually
    A. because you tried hard to remember, or
    B. because the teacher explained it well?

30. If you can't work a puzzle, is it more likely to happen
    A. because you are not especially good at working puzzles, or
    B. because the instructions weren't written clearly enough?

31. If your parents tell you that you are bright or clever, is it more likely
    A. because they are feeling good, or
    B. because of something you did?

32. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often
    A. because you explained it well, or
    B. because he was able to understand it?

33. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. Is it likely to happen
    A. because she was more particular than usual, or
    B. because you answered too quickly?

34. If a teacher says to you, "Try to do better," would it be
    A. because this is something she might say to get pupils to try harder, or
    B. because your work wasn't as good as usual?

APPENDIX "A"

TEACHER EVALUATION

At the start of this program, I can remember having many doubts about various parts of the program. Would the student be able to get correct information from sources other than the teacher? How clean will the shop be? How can a student learn to operate a machine without a teacher demonstration? How can a student learn correct procedure without the information coming from a teacher? Will we have machine accidents because of students not being properly checked out on the machines?

As our planning meetings progressed, it was evident that most of our doubts could be overcome by using innovative methods which various members of our group could offer. Most of our planning was based on teaching responsibility and having junior high students accept responsibility. After three quarters of a year, I believe we have made great progress in this direction. The students are taking their own attendance, seeking their own information in preparing to use power equipment, keeping their materials cost record in a balanced condition, keeping a record of their own activities on their performance record and doing a creditable job of keeping the tools and shop in good order without having jobs assigned.

One of the immediate gains noticed early in the program was the lack of having to handle discipline problems. The students were interested in going to work and did not seem to have time to misbehave.

As in any program, problems continue to arise and changes in procedure must be arranged. The continual goal is for the students to look for answers to their own problems and to solve them through the use of various media. This is just exactly what is going on in the program. The prime factor in this student action is motivation. The pleasant, colorful areas where they work are laced with project models and plans that interest and encourage students.

There is no doubt in my mind that this is the most enjoyable of the 17 years I have taught industrial arts. I have more time to spend with individual students and the student has an opportunity to investigate different areas in which he may develop interests.

I can visualize in the future, that more junior high students will be able to explore in the industrial arts department. With cooperation from other fields, we could go to a one semester course per year for each student. This could involve our entire student population.

APPENDIX "A"

TEACHER EVALUATION

My twelve years as an industrial arts teacher have always meant change in one way or another. New materials and new areas of exploration have never allowed me to get into a lockstep and follow the same processes each year. The one thing I did let follow me pretty much year after year, was my teaching method.

Breaking away from a pattern for teaching didn't come easy. Especially if you haven't seen it done and have seen some results that point to success. Going through your file cabinet and throwing away those valuable tests you have spent hours making isn't easy. I had to ask myself how are they going to learn anything now without these? I also asked the next question which made it more easy to direct them to the circular file, which was, how much material did I spoon feed so that I could get satisfying results?

Most of my apprehensions were when we were in the planning stages, especially regarding my group instruction I had been giving on safety for 12 years. Once the students came into the remodeled shop and I got the feel of how it could function without me as the director, it started to make sense and I could see the students begin to direct themselves.

They didn't do the best job right off and this tore me, because I prided myself on having a clean organized shop. I found myself thinking, should I stop this and get a clean up crew started, or what? After some talk between the teachers, we gave a moment to telling the students about their responsibilities under this program. This helped and ever since, there has been growth. It took me some time to think that this new role was also very different to the student and they too had to make adjustments. He now has a role of personal responsibility. He is to be self directed and because of this, he has some real adjustments to make and it is going to take patience on my part until they have reached a point that is tolerable. I feel the students are fulfilling their role more and more as they grow in the project's structure.

As the teacher I now am moving around more to individuals and am able to give assistance to problems by either redirection through available media, or by working hand in hand with the individual.

In evaluation, I would say it makes me feel good to see the shop functioning by this individual method on their own ideas. It removes the pressure of planning each students day for them, but lets you offer direction when they need it.

Getting the students to accept responsibility for their messes and material records has not always been easy, but by giving reminders and in some cases restrictions, they have come back to do a better job. There has been such a great variety of activity going on, that in no way could I have covered what I have seen going on in a group directed teaching method. Home repair items have been brought in more than ever before. In other words, projects with purpose.

For the future, I want to get more things before them in general industries and electricity, so that they may see more things in these areas which will motivate them to want to explore these to greater depth.

APPENDIX "A"

TEACHER EVALUATION

Two years before the Occupational Versatility test program started, another teacher and I were team teaching in all areas of shop. Our program was set up so that all the sixth and seventh graders had a spelled out program and the eighth graders worked on individual student design projects.

When we began the program, I was looking forward to teaching in a different curriculum designed to meet the needs of each student. Our program is set up so that no grades are given. The key to the success of our program revolves around the use of the student notebooks. Each student is held responsible to take role, to keep his finances in order, to evaluate his performance and to accept the responsibility of working and maintaining the order of the shop. The student will accept this role if given a chance. Also the teacher has to accept his new role of guidance.

I have found that it is good to be more open-minded and not be afraid to try new methods for teaching. We have shown that other media such as films, books, charts and students themselves can be used to teach. The teacher no longer has to play the main role of information center, and does not have to give large group demonstrations.

Even though I went into it with an open mind, I wondered if it would work out. For example, in regard to use of power tools, I was concerned about safety of the student and the liability of myself as teacher. It is difficult to break with the old tried methods such as safety testing each student before using power tools. Each student is held accountable to learn for himself about the power tool he wanted to use with a final check from the teacher. I was difficult at first to place the responsibility of using other sources rather than the teacher on the students.

There have been a few problems. Some students show a disrespect for property of others and some cannot take the responsibility of working by themselves, and therefore stand around wasting their time and others. It is difficult to get these students busy and use their time for their benefit. Also the fact that the program runs in twelve week sessions and there are so many in one class, makes it difficult to get to know each student.

Even though there are some problems and areas that need improvement, next year should prove to be a better year. Improvements will be made in areas that are lacking in student involvement and the shops will be completed as far as subject matter is concerned. Also the seventh graders will have had a years experience to become involved in the program. It will be interesting to see two or three years from now, after the resource material has been improved and the students become more accustomed to the program, how the students will respond. It is really too soon to tell what the long range outlook will be, but I feel that it is a working program with many advantages and has been accepted with much enthusiasm.

APPENDIX "A"

TEACHER EVALUATION

At the beginning of this year, I had several apprehensive thoughts as to the changing of my teaching methods from the traditional teacher dominated, to the individualized, self responsibility concepts of Occupational Versatility.

Probably some of my first apprehensions of the program were due at least in part to the fact that I was not in on the planning for the program at the very beginning. As a consequence I was considerably behind the other staff members as to what had already been discussed and decided upon. When I did enter into the program and began attending meetings, I would frequently leave feeling very frustrated and with the feeling that my time had been wasted and nothing accomlished because I could not see how what was discussed fitted into the overall program. During this breaking in period, it was necessary also for me to sort out and more or less establish my philosophy of industrial arts.

All during the summer months, I still had doubts as to the workability of the program and its acceptability to the parents of the students. I felt there would be considerable resistance to the ungraded concept, which as it happened, apparently were groundless worries.

Other doubts were the use of open tool panels, since it had been my experience in the past that even with locked cabinets, certain types of tools disappeared. Quality control was another concern, since an instructor would not be checking each step before allowing the student to proceed to the next step. Loss of materials was also a concern, since it would be stored in unlocked open areas.

Probably one of my outstanding concerns was that of the team teaching aspect of the program. More specifically, I was worried that I might not be able to spend the whole year on good terms with the other instructors.

Other doubts were about keeping track of and supplies enough for all the different projects, student selection of projects that were not beyond their capabilities, and would the students utilize their time.

Some frustrations I have had since the program has become operational are, that it seemed to take a long time for the students to accept the responsibilities of things like clean up, making entries in their notebooks, getting students checked out on the machines, etc.

It has taken me a rather long time to find out where we stored all of the materials and I tend to get frustrated in not being able to get some particular tool or materials without an intensive search. And it has been exceedingly hard for me to resist changing some established procedure without giving it a fair chance to succeed.

Now as I look back on the year, I find that many of my worries and doubts were groundless and as far as the future outlook is concerned, I think that with a few necessary changes in procedures, area changes, etc., that will be accomplished during the summer, the program should become a very smooth running, objective educational experience for the students and a more enjoyable situation for me as an instructor, because so many of the little housekeeping and record keeping type of activities are taken care of by the program and I will be free to spend more time working with students.

APPENDIX "A"

TEACHER EVALUATION

It was hard to change from completely demonstrating skills and processes, to becoming a counselor and guide. I had my doubts as to whether the students could accurately keep their own records in their notebooks and satisfy the parents, office and me. This doubt quickly vanished. I was fearful about the safety aspect of the students using the power equipment without a teacher being in the immediate area at the time. When there are students involved in so many areas at the same time, I felt this could be a problem. I feel the program has proved that 99% of the students can discipline themselves safely in the shop.

The biggest problem of adopting to a new system is the fact that work stations, information sheets, etc. are not totally complete. Another problem is that when there are so many areas all in operation at the same time, there is continual maintenance of equipment and ordering of supplies.

The students are getting a much broader experience in more areas, but in most cases they are only "skimming the surface". This is part of the philosophy of the middle schools program and they can obtain depth at a later date, for example in high school. Most of the students have shown that they can accept the responsibility that we have put before them. The teachers role is to assure the student that his knowledge obtained through research is correct and ample to complete the task. With the teacher taking this role, the students have to seek through the provided media the knowledge needed to complete their goals.

With the enthusiasm of the student working in the shop in his choice of projects, the general atmosphere is one of a place to learn and work independantly and harmoniously with other students. With technology changing so rapidly, students must know how to research their own problems so they can keep abreast of the changing times; my hope is that this program will help teach them this.

EQUIPMENT OPERATION CHECK LIST

NAME _____ PERIOD NO. _____ GRADE LEVEL _____ NOTEBOOK NO. _____

1. YOU ARE RESPONSIBLE TO PREPARE YOURSELF BY USING THE MEDIA, AND THEN CHECK THE APPROPRIATE COLUMNS.
2. ASK INSTRUCTOR TO CHECK YOU OUT ON THAT EQUIPMENT.
3. YOU ARE RESPONSIBLE TO HAVE INSTRUCTOR INITIAL THAT YOU HAVE DEMONSTRATED PROPER AND SAFE OPERATION.

MEDIA USED TO FIND INFORMATION

EQUIPMENT OPERATION NOTEBOOK	BOOKS & CHARTS	FILMS	TAPES	TAUGHT BY OTHERS	STATIONARY EQUIPMENT	TEACHER INITIALS	DATE
					BAND SAW		
					BEVERLY SHEAR		
					BUFFER		
					BENDER		
					DRILL PRESS		
					INJECTION MOLDER		
					KNOTCHER		
					METAL CUTTING BANDSAW		
					POWER HACK-SAW		
					ROTATIONAL MOLDER		
					SANDER		
					SCROLL SAW		
					SOLDERING FURNACE		
					SQUARING SHEAR		
					STRIP HEATER		
					VACUUM FORMER		
					WIRE WHEEL		
					WOOD LATHE		
					PORTABLE TOOLS		
					BELT SANDER		
					ELECTRIC DRILLS		
					HEAT GUN		
					ROUTER		
					SABER SAW		
					SPOT WELDER		
					VIBRATOR SANDER		
YOU MUST HAVE INSTRUCTOR PERMISSION EACH TIME YOU USE THE FOLLOWING 9 MACHINES							
					ARC WELDER		
					FORGE		
					FOUNDRY		
					GRINDER		
					JOINTER		
					METAL LATHE		
					OXY-ACETYLENE WELDING		
					PANTOGRAPH		
					TABLE SAW		

(GREEN) REV. 8/19/71