

PLANNING AN ARTS AND CRAFTS CENTER  
FOR ROOSEVELT HIGH SCHOOL

by

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A RESEARCH PAPER

submitted to

OREGON STATE COLLEGE

in partial fulfillment of  
the requirements for the  
degree of

MASTER OF EDUCATION

June 1948

APPROVED:



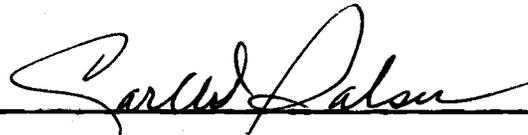
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# PLANNING AN ARTS AND CRAFTS CENTER FOR ROOSEVELT HIGH SCHOOL

## CHAPTER I

### INTRODUCTION

The Portland schools have gone on record as advocating the adoption of the comprehensive high school plan of organization. If such a program is to be carried out in reality, it must be recognized that to date none of the departments requiring special equipment is adequate.

Roosevelt High School was built in 1921 with the industrial-arts shop in the basement of an unfinished wing. As the enrollment grew, it became necessary to move into a portable to make way for the shower and dressing rooms for the physical education program. For twelve years this single shop and a mechanical drawing class which has been shoved off into a locker room have represented the industrial-arts program of Roosevelt; the student enrollment has nearly tripled. The lean years of the depression, followed by a period of scarcity of good tools, have led to a very run-down department.

The art department is now housed in a portable and in a room in the main building originally intended to be a boys' lavatory. Neither of these rooms can be called even partially adequate for a school of this size if it

is trying to become a comprehensive high school.

The home economics instruction is carried on in similar quarters; the portable is too small to handle the cooking and has poorly planned storage arrangements. The sewing room in the main building uses the hallway to the unfinished wing of the building for student storage space.

The people of Portland have finally realized that to have a proper school system for the training of their youth they must pay for its development and upkeep. In March, 1945, a measure was approved to provide funds for the

. . . . postwar construction, reconstruction, improvement, betterment, repair or rehabilitation of schools, school plans and school premises so as to more adequately accommodate the public school population . . . . .<sup>1</sup>

As some of this fund is to allow for the improvement of the facilities of Roosevelt High School, it was thought that some preliminary suggestions should be presented to the School Board to express the desires of the school staff for such improvements.

This paper will present that study and should not be considered as a substitute for the services of the architect but rather as a guide to his work. Perhaps some

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<sup>1</sup>Portland Public School, Modernizing the School Plant (Portland, Oregon: 1945), p. 2.

individuals may contend that the entire plan should be left to the architect whose job it is to plan a satisfactory building. However, there are few people who would not wish to give their architect general suggestions on the design of their houses; so it would seem only right to have those who will be working in the school given a change to set some of these guides.

Many architects do not want teachers to have anything to say about the room layout,---"too impractical"---but it is the teacher who is doing the teaching. There is no one better qualified to design the layout of a shop or laboratory than the teacher. It isn't that they are expected to make the blueprints of ideal classroom layouts, but rather that they have the opportunity to express their ideas as to what makes an instruction area fully usable. Effective teaching can only be done with proper equipment and room arrangements.<sup>1</sup>

A school shop is far different from any other room in the building and also far different from any commercial shop in the same field or from a combination of the two.

When new shop rooms are to be built, the teacher or director of industrial education should take a very active part in the planning of these rooms. Architects are studying the problem of school-shop design more than formerly, but too few of them fully appreciate the problems involved in effective shop planning. A wise shop teacher or director will draw up complete plans carefully worked out in the

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<sup>1</sup> William F. Kimes, "Steps in Postwar Building Campaign," School Board Journal (December 1945), p. 45.

light of all available facts involved, before the architect begins work . . . . .<sup>1</sup>

The responsibility which rests on a group assigned the task of planning for an industrial-arts department of a school is an important and a challenging one, and the task demands considerable thought and insight. The building space required calls for the outlay of a large sum of money and equipment is expensive. Errors in room planning and equipment purchases are therefore costly, not alone in money, but wrong planning and wrong equipment selections may obviate the very purposes being sought through industrial-arts experiences. The problem should therefore be approached with a thorough understanding of the general educational philosophy and of the objectives of industrial arts as a guide.<sup>2</sup>

It is possible that one might find architects with such training but doubtful when the contracts are to be let to a firm of architects that meets the following qualifications:

They must give the lowest bid. They only need be registered architects in the state with offices in Portland. They must have a staff of five or more. They must have been the architects of a building costing in excess of \$100,000.00.<sup>3</sup>

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<sup>1</sup> Arthur B. Mays and Carl H. Casberg, School-Shop Administration (Milwaukee: Bruce Publishing Company, 1943), p. 8.

<sup>2</sup> Roy R. Van Duzee, "Planning and Equipping an Industrial-Arts Department," Industrial Arts and Vocational Education, (XXVIII, November 1939), p. 349.

<sup>3</sup> Portland Public Schools, op. cit., p. 124.

This report then will cover the examination of the needs of the school, the solutions to planning problems used by others, and applications of these findings as a general guide for the drawing of the construction plans.

## CHAPTER II

### NEEDS OF A SCHOOL

Before one attempts to decide the needs of a department or departments of a school, one should try to determine how that department contributes to the training of the youth for whom the school is established. With the original introduction of the industrial arts program, there must have been a far broader outlook on the field of education than that of the early school with the one room and three R's. In these pioneer schools the student that completed eight years of schooling was considered well-educated, but now we require the child to attend school until the age of sixteen at least, and the public is rapidly demanding a college education. Then, the dull student could be dropped by the wayside and still get into a good job; but now, even if the schools wished to do so, they would not be permitted to drop even those who do not succeed well in the three R's. Today the school is expected to turn out a young man or woman happily adjusted to his environment, able to make his own living, and able to make a worthwhile contribution to society in his own community, nation, and the world.

Mastering the three R's makes a person literate. It doesn't necessarily make him civilized. There are few illiterates in Germany and Japan. How many really civilized people these countries really have is quite another question. Our schools therefore cannot be content with teaching the three R's. They must make sure that with the help of these tools, our children acquire the sciences, the literatures, the histories and the social sciences which make up our 20th century civilization. They must develop the understanding which will enable them to live with each other and with the other nations of the earth. They must learn tolerance, a sense of fair play and a willingness to cooperate with the forces of decency and human betterment.<sup>1</sup>

This kind of training cannot be done in the old style classroom but can be accomplished only by actually experiencing life problems. It is a well accepted premise that the child learns by doing, not by sitting and listening; but to learn by doing requires much more equipment than to sit and "learn."

To teach a person to think and to be able to meet the problems that will be in his everyday changing life, one must train the student to meet situations in a manner that is conducive to careful analysis of the facts involved; so that he can determine what he will accept and what he must discard. A happy citizen in our country must be able to choose the premises he will accept and with these, be able to decide what his actions will be. The schools should

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<sup>1</sup>Ibid., p. 6.

train youth to think, to meet decisions, to face them in their true light and to resolve them, considering all the available facts. If the school could accomplish this, it would have gone far in meeting its obligation to the American people. Not only in the social sciences but also in the industrial arts, in the arts, in mathematics, and in the physical sciences one finds challenging problems that will train the student to meet his world.

Learning to think straight is not the only obligation of the school in this day of high competition. There are many others; the most obvious is that of training one to be able to make a living. But the less obvious corollary to making a living, and yet a most important one, is learning how to spend that living wisely. If there were ever a time one needed such training it is now. Every aid that the school can give in vocational training is badly needed. Vocational training required for today cannot be given without the proper facilities and surroundings. Surroundings must be pleasant to get the best results, but still they must be practical.

If one is to have laboratories or shops, one must be sure that they insure opportunity for the student to work under healthy and safe conditions.

The welfare of the child is predominant, and seeing is the most vital of human tasks. Color, therefore, takes on the immediate role of aiding visibility, of relieving eyestrain. The esthetic

aspects are thus last rather than first in the reckoning. For when the eyes are abused, physical reactions are to be noted in a generally nervous condition, increased muscular tension, severe dilation of the pupil of the eye, rapid blinking of the lids, changed heart action, headache, fatigue.

All this means that ample light is needed in the classroom. And more than light, a proper balance of color and brightness on walls, ceilings, floors, and desks is necessary in order to reduce glare and sharp contrasts. For color is what gives reality to light, the whole action of seeing being in terms of areas, surfaces, and objects which must be visualized.<sup>1</sup>

There is little excuse for spending large sums to educate youth under such conditions that they come out physically unfit, yet in this great center of electric power there are practically no school rooms or laboratories that can boast having adequate light.

As this country gets back into the swing of being the great industrial power it was, it will find more and more that men need adequate training in the art and pleasure of using their leisure time in some satisfying manner. With machines removing the drudgery of everyday living problems, there is and will be much more time which should be put to worthwhile use or it will cause far more grief than the machines have relieved. Developing outside

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<sup>1</sup> Faber Birren, "Color Must Be Functional," The Nation's Schools, XXX (December 1942), pp. 39-41.

interests, hobbies, and appreciations of many of the worthwhile recreational outlets that can make living more pleasant becomes a real problem. It is one thing to talk about crafts, sports, music, and art and still another to give a real understanding of these and sufficient background that the student will go ahead and get started in one of them. To meet this need a school must be equipped with adequate gymnasiums, auditoriums, music rooms, art and craft rooms, and shops. These special rooms will have to be specially arranged to achieve the results for which they are set up and still be flexible enough to meet the conditions of the rapidly changing world.

To meet a postwar need many schools are finding that they must give a constructive and complete night program of training for adults and for ex-servicemen who missed these courses when they were suddenly called off to war. The demand seems to be largely in the art and the industrial-arts departments as men find the need of training in the use of their leisure or in some specific craft necessary to secure their positions. In establishing the physical therapy program, the Army Air Forces has found that every possible educational activity should be provided as soon as the patient can leave his bed. This program should not terminate with the serviceman's entrance into civilian life, but should be enhanced by the

opportunities offered by the public school. Mr. Verne C. Fryklund, reporting on this program writes that,

. . . . Among these activities are shopwork, academic studies, music, agriculture, and art. Attendance is 3 to 1 in favor of the shops. This is according to patient<sup>1</sup> interest and not by other influences. . . .<sup>1</sup>

Community centers for recreation are also becoming an accepted part of our mode of life, and schools are finding that they are called upon to furnish facilities to aid in this program. This conception seems right, for the equipment is there at these centralized community-owned buildings. It is up to the planners of schools to see this coming trend and to act accordingly, not stretching the school program too thinly, but planning a program that will truly meet this need.

In summary, the industrial-arts department of any school must be one where action and doing are encouraged. It should give training in how to live with one's classmates so as to prepare for a full, vigorous and intelligent citizenship. Under safe and healthy conditions the student should be encouraged to think for himself, analyzing the problems and planning his actions as he discovers possible solutions, so that in life the daily

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<sup>1</sup>Verne C. Fryklund, "B: A Hammer and a Saw," Industrial Arts and Vocational Education, XXXIV, (November 1945), p. 387.

decisions will not down him. To make his leisure time more enjoyable and worthwhile he should be given every possible opportunity to learn and to appreciate music, art, and the various crafts, and to learn not only to be a good listener and observer but also a good participator. If the department can give vocational training, so much the better; but it should certainly introduce the students to the varied occupations allied to the selected vocation, so that they will know whether to study or train further along any particular line. The challenge is great, but it must be met; and a proper layout makes the meeting much more possible.

## CHAPTER III

### NEEDS OF ROOSEVELT HIGH SCHOOL

#### The Portland School Modernization Plan

It became evident that the Portland schools were desperately in need of special aid to repair and rehabilitate the badly overcrowded and run-down school equipment and that some of the necessary money was available; so the administrative staff of the system compiled a report of the needs of the system and outlined what should be done to modernize the entire system. This report, published in November, 1945, by the office of the superintendent, complete as it was, could give only the general needs of the system and its schools.

The findings it made in the population trends of the city are of importance to this paper. The study carefully investigates the trends of the chief businesses, the past records, and forecasts for the future. It reports that the lumber industry is shifting permanently from Portland; that shipping will drop back to normal, and that ship repair work, which is replacing shipbuilding, will never absorb the workers who came here during the war. Neither the advent of new light-metals industries nor heavy industries are likely to increase the employment

or population appreciably. It is interesting to note that with all this in mind the report is still optimistic, as the following reference indicates.

However, our city is a good place in which to live and to work. The Pacific Northwest will continue to attract some people from all parts of the United States as it has in the past. A postwar slump may slow down the normal rate of growth but not for long. In the end, the trend will be resumed and Portland may expect to find its population constantly renewing itself and even experiencing a steady though conservative increase. Anyway, this report is based upon an optimistic note, and the expectation that the city will continue to be a vital metropolis with a conservative but steady rate of population increase.<sup>1</sup>

Apparently the return of the veterans is expected to offset the emigration of war immigrants. The report goes on to point out that the City Planning Commission, upon which much of the school report is based, believes that sales, service, and office jobs will be the occupation of the bulk of Portland's population in the postwar years. This population will, then, depend for its livelihood upon such industry and trade, both foreign and regional, as will develop. This uncertainty as to what work will be available leads to a moving of the population, which makes definite planning on a large scale a risky proposition. It is believed that the population is shifting

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<sup>1</sup> Portland Public Schools, op. cit., p. 12.

from the center of the city to the outlying districts. This shift may account for the increase in enrollment at Roosevelt High School, which is situated in the Peninsula District, close to the industrial areas which are being planned for the near future. For this reason it is believed there is little doubt that Roosevelt will be one of the schools which will show a steady growth.

According to the superintendent's report we find that at least twelve new classrooms are necessary; that they can be made available by connecting the new wing now used for the gymnasium; and that a new gymnasium must be built to replace it. There should be at least two new shops in addition to something to replace the present makeshift arrangement. To meet the needs of the home economics department, there should be at least four rooms to replace the two now in use. The art department, temporarily housed in a "portable" and in a room intended for a boys' lavatory, should have five rooms to handle adequately the enrollment. That department, like all the others, needs a great deal of new equipment to replace the badly worn or makeshift tools which have been holding the line. From the foregoing there should be little doubt that there is need for expansion and modernization, and that the administration sees the need.

### The Views of the Staff

The Portland School Modernization Plan just discussed was based on the study made by the Administrative Staff of the system. It does not exactly coincide with the views of various people working "on the job" at Roosevelt High. For that reason consultations with staff members have been conducted as a means of determining their wishes and ideas so that these ideas could be incorporated into the overall plan. Their comments have been summarized as accurately as possible. It should be recognized that in most cases the persons were familiar with the modernization plan, so they did nothing more than emphasize the points they wished to have considered in the plan and added their own observations.

Mr. H. M. Barr of the Department of Research, Portland Public Schools, believed it was especially important that the relations of the shop to the rest of the school be kept in mind, not only in the physical layout but also in the matter of correlating the shop program closely with the other departments. He also pointed to four major considerations: the importance of pupil interest; training for life and a place in the industrial world; importance of cultural and incidental learning; and the great need of developing in the pupils, approved character traits. Loose though these objectives may appear to be, they are

distinctly a responsibility of the school and of the departments in question. Mr. Barr went on to say that, especially in the Roosevelt district, there is a great need for a community center, and that the trend is to make school equipment both fitting and available to the people for this type of use---if for no other reason than that the state gives generous financial aid to night classes which may thus be set up.

Mr. G. C. Hendricksen, supervisor of Industrial Arts and Vocational Education for the Portland Schools, listed the basic requirements of the department, and then proposed a sliding scale of additions which would make the program more adequate. He pointed out that the small shop should be and usually was a general woodworking shop, because wood is the most common medium upon which the student can work and because the basic tools for all other fields are similar to those used in woodworking. If the school can add another shop, it should be a general metal shop which would provide mostly for sheet metal work. The third would be an electric shop; and then, if possible, a machine shop to supplement the general metal shop.

Mr. Hendricksen pointed out that auto mechanics had no place in the comprehensive high school because the maintenance of the automobile has become so specialized that it requires an expert to give it a routine check up.

This skill is far too involved for the high school student to master except in a trade or technical school. Since a home maintenance class, if well operated, requires much storage space and the use of tools similar to those used in all these other shops, it should probably be the last one to be added.

If arts and crafts courses are to be added, Mr. Hendricksen said they should be given in a large shop divided with waist-high partitions, except that the noisy work should be done in glassed-in sections. Again, he listed these items or expansions in the order in which they should be added as the budget would allow. Art metal, which should include cutting, trimming, soldering, buffing, and etching, was the first addition recommended. Work in plastics is a present trend and would call for a jig saw, an oven, and possibly a sander in addition to the art metal tools. Leather working, he noted, would require the least complicated equipment, merely work tables, cabinets, and hand tools, many of which could be made by students and staff. A graphic arts area should be planned to include drawing, silk screen work, and wood and linoleum block printing. If possible, there should be an area for ceramics, which should include a good-sized kiln, a potter's wheel, and ample bins for the clays. Weaving, a most intriguing art, either in cloth or raffia, would

require several looms of the various types. He concluded by saying that this program would be ideal and maybe some day it would be in operation.

The former principal of Roosevelt High School, Mr. John W. Griffith, had given the development of enlarged shop facilities considerable thought and was instrumental in having the school's needs carefully considered in the city-wide modernization plan. He had for years realized the need for a more expanded program and more adequate facilities. A strong advocate of home mechanics, he also recognized the need of a wider variety of classes than is now provided. He worked hard to secure sheet-metal equipment and to enrich the very narrow selection of shopwork now offered. He pointed out that additional shop facilities were needed immediately and that at the time no upper-term classes could be offered to the many students who would otherwise be very anxious to have some work in wood or metal. The school was (and is) so crowded that no freshman course in beginning mechanical drawing could be offered if the upperclassmen were to be provided for.

Mr. H. A. York, the present principal, came to Roosevelt in the fall of 1946, from Lincoln, where they have no shops. He did not consider himself an authority on the planning except to point out that there must be considerable addition to the arts and industrial-arts

staffs, space, and equipment. Obviously, dividing the present gym into classrooms and shops would not make adequate space for either, without pushing the shops into the dark basement.

Mrs. Mildred Bassett, vice-principal in charge of planning the school program, was very much interested in the projected development and believed that there would undoubtedly be two mechanical drawing rooms, two each of the sewing and cooking rooms, and four rooms for art. She reported, however, that the present enrollment in these courses does not show this need. Her estimate of it is based on the number of students who try to sign up for these subjects but have to be turned down because of the present lack of facilities. Besides these eight laboratories, she believes additional instruction rooms are needed. She also strongly emphasized the need of a proper home demonstration room and a nursery training room.

In order to get the best idea of the desires of the present teachers in the various departments, conferences were scheduled with each of them to discuss the matter. The following were some of the requirements especially emphasized.

The art teachers were very definite in their request for more storage and drying space for students' work. They want a movie projection room and at least one more

general classroom for art work. They believe that there must also be an art-metal room and a craft room. Art advertising has become very popular even with the present unsatisfactory arrangement. Because of the lack of large tables, posters have to be made on the floor of one of the main halls. If this art course were offered to all who want it there is little doubt that there would be ample numbers to fill the schedule of another room.

The homemaking teachers both expressed the need of more usable and better organized storage space and cabinets. The present arrangement was very poorly planned and cannot be modified without major changes. There is no satisfactory place for practice in home decoration and arrangements, nor for nursery training such as the school should offer. The lighting, as in all other rooms, is painfully below minimum standards so that they both mentioned the need of planned lighting. For the number enrolled, they believed that the addition of an instruction room and a home demonstration room would be desirable.

#### The Students' Interests

To survey the student interest and background as to both hobbies and vocations a questionnaire was circulated in the registration rooms. This was done in as informal a manner as possible so that the students would be free

to answer frankly. Several questions were included, at the request of the counselors, to collect data for their use. Though these questions were interesting, they have little bearing on this paper. For this reason they will not be discussed further.

It was not desired that the students follow a set pattern, so the questionnaire did not list any sample hobbies or occupations. This deliberate omission led to a great number of occupations being listed, many of them closely allied. In cases where the vocations were practically the same, they were tallied together; but even so 140 occupations and 84 hobbies were listed. A complete list and number of first, second, or third choices for each will be found in the appendix. There also will be found a list of the various hobbies the students were interested in and those in which they would like to have had more training.

In examining the results of the questionnaire, it is interesting to note that secretarial positions were chosen by nearly three times as many as chose the next most popular occupation, nursing. The boys' choices were far more diversified, with engineering, medicine, and the Navy being the most popular. In grouping these occupations according to the school department with which they are most closely allied, we find the industrial and the commercial type of

job far in the lead.

Again, in the number desiring to take certain subjects we find the interest in typing nearly double that of any of the others. Art was next choice, with shop, mechanical drawing, and homemaking classes nearly equal in general demand.

It should be pointed out that the actual popularity of classes is no true indication of the real need. Typing has been withheld from all underclassmen, while art, homemaking, and woodshop have been required of them. This may be the reason that typing receives a larger share of requests in a questionnaire that includes students of all terms.

The questionnaire does show a definite need for expansion in the arts and crafts line in order to meet the requests for preparation for hobbies. It also shows the need of more industrial-arts and homemaking classes to acquaint the students with various occupations and to furnish sampling opportunities that might suggest new interests.

## CHAPTER IV

### ESTABLISHED STANDARDS

It would be incorrect to say that there are truly established standards for our industrial-arts program. Almost every state has set up standards for the curriculum, and there have been many studies of what the minimum should be; but when the actual situation is considered, there are so many local controlling conditions that these studies are usually set aside. There are, though, rather definite requirements that certain courses demand if they are going to be well handled.

The present trend in Portland and at Roosevelt is toward the breakdown of the barriers between the industrial-arts, the art, and the vocational fields. This is possibly because of the extreme shortage of materials and the resulting need of reducing any costly overlap or repetition. Whether it is good or bad is not the concern of this paper but in order to reduce the necessary outlay of equipment the divisions will be overlooked.

Assuming that Roosevelt will need to have two rooms for drawing, a woodshop, an electric shop, a general metal shop, a crafts room, two rooms for general art, a commercial art room, five or six rooms for home-making, and various rooms that go with these, it would

undoubtedly be advantageous to have these together in one unit. As they are closely allied, a planning room with a departmental library would be a real asset. Exhibits of student work of one class would be stimulating to all the classes, especially if these were shown in a "planning library" where students could do their planning with goals and inspiration in front of them. Storerooms, supply rooms, paint rooms and others will be necessary; but, before too much enthusiasm is developed about the auxiliary rooms, let us examine the needs of the various classrooms or shops. They are of first importance. It is obvious to anyone acquainted with art, industrial-arts, or home-making courses that the ordinary classroom will not do; nor will a converted room be as successful as rooms well designed for the purpose.

The teachers necessary to properly handle the program just indicated must be well qualified people who understand the entire program. At least six teachers would be necessary for the industrial-arts part of the program to be in full operation. This is just the number recommended by Ericson<sup>1</sup> who conducted a study of the schools

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<sup>1</sup> Emanuel E. Ericson, "Number of Industrial Arts Teachers Needed." American Vocational Association Journal, XIV (September 1939), pp. 151-152, cited by George B. Cox, "A Guide to a Shop Planning Program for the Oregon Schools," Unpublished Thesis, (Oregon State College, 1939), p. 44.

in the forefront in the industrial-arts field. He indicated that there should be one industrial-arts instructor for each 150 boys included in the entire school enrollment. As the projected enrollment of Roosevelt is 1800\*, there would be approximately 900 boys. George B. Cox, in citing Ericson's work, emphasizes the point that this method of determining the number of teachers is based on the total school enrollment and that it should not imply that each teacher should have 150 boys enrolled in his classes.

#### Size and Shape of Shops

The size of a shop depends largely on the number of students and the type of shop. The general type of equipment and whether large or small machines are to be used also have a bearing on this problem. When a shop is being built, it is foolish to try to squeeze down the expenses by crowding to the point where efficiency is lost. Too often we pinch pennies only to find later that we have been extravagant to the point of making rebuilding necessary. Ittner, who is considered an authority on school design, writes:

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\*Portland Public Schools, op. cit., p. 97.

As to the number of square feet per student, this varies from the established minimum of 50 sq. ft. to more than double that amount. Other variations for size of shops will come with the number and size of machines and working apparatus.<sup>1</sup>

It should be noted that this figure of fifty square feet is the minimum. Leaf<sup>2</sup>, in a survey of fifty-six small general shops, found the average floor space to be approximately eighty-six square feet. These figures in themselves are of little meaning until one considers the shape that is to be used for the actual shop purposes. The following are dimensions suggested by Ittner<sup>3</sup> as satisfactory room sizes for classes of twenty-four pupils:

General woodshop, 30 by 58 ft.  
 Metal and machine shop, 30 by 64 ft.  
 Auto mechanics shop, 38 by 88 ft.  
 Electric shop, 23 by 57 ft.  
 Mechanical drawing room, 29 by 36 ft.  
 Print shop, 23 by 42 ft.

It should be mentioned that this estimate was based on the same number of students in each class, which is not making best use of the facilities. That is to say that a

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<sup>1</sup>William B. Ittner, "Planning a Workshop from the Architect's Viewpoint," Bruce's School Shop Annual, (Milwaukee: The Bruce Publishing Co., 1932), pp. 52-53, cited by Mays and Casberg, op. cit., p. 9.

<sup>2</sup>Elmer M. Leaf, "A Survey of Present Practices in Shop Planning with Recommendations for Organizing Small Secondary School Shops," Unpublished Thesis (Oregon State College, 1939), cited by Cox, op. cit., p. 87.

<sup>3</sup>Ibid., p. 50.

course in auto mechanics, though it requires much space, would be much more effective if the number of students were fewer than a similar class in electricity. The specialized complications in the mechanics class would call for far more individual instruction. From the point of view of the administration it is far easier to have all classes the same size, but one should remember that the school is not set up for the convenience of the administration. ". . . . Obviously a class in furniture construction where projects are large needs to be smaller than a class in model airplane construction or drafting.<sup>1</sup> The present aim of the counseling staff at Roosevelt High School is to keep the woodworking class under thirty, and it is hoped that with the expansion of the department, this number can be lowered considerably. For this paper let us assume that the above figure (24) is reasonable.

A room of the present "L" shape can easily lead to difficult discipline problems since the instructor finds himself unable to see what is going on around the corner, and it is almost impossible for him to stay where he can see both sides. If the shop is too long, we again find not only discipline problems but also too much time is

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<sup>1</sup>Wisconsin Department of Public Instruction, Teaching Industrial Arts in Wisconsin Schools. (Madison, Wis., 1938), p. 48.

lost going from one end of the room to the other. The square room is not satisfactory where machines are to be operated, because there is too much floor space lost in an effort to secure satisfactory light and relationship with other machines. This rule of the square rooms being poor does not necessarily apply to rooms where there is no machinery or complicated equipment.

### Supplementary Rooms

Rooms such as the shop library, lumber storage, paint and finishing, project storage, fitting and wood storage rooms must certainly be taken into account. If possible, the laboratories should be grouped so that a common library and a common demonstration room could be used with convenience.

Storage Rooms. The lumber room, especially, and other storage rooms should be so placed that there is easy access from not only the shop involved but also the receiving platform. The more direct the route of the supplies the more likely that they will reach their destination. Mays, in his book "School Shop Administration," is of the opinion that it is more important to have the delivery convenient than it is to have the storage room convenient to the shop. No other source has been found to substantiate this point of view. It is questionable,

because the deliveries usually come in large quantities when there is already class interruption, so that help can be assigned to handle the delivery. If the supply room is not convenient to the shop, there will be constant confusion each time that a supply item is necessary.

The actual size of the supply room depends largely on the availability of materials. If the turnover is rapid, the storage space need not be so large; but if the shop is to store large quantities of various materials for the whole year, there must be adequate room not only to store but to allow for classification according to size and variety so that any item is immediately available. One of the easiest ways to have a shop look unkept is to have materials stacked about the room even in an orderly fashion. This shop is especially difficult to keep neat if the students are permitted to get into the stacks. The loss of materials in open storage is usually great enough to prove the value of adequate storage rooms. In some cases it will be found that a joint storage room to serve several shops has its advantages; but if student help is to be used to distribute the materials, this is not so likely to work out well.

In small shops, especially where only one class uses the tools, the tool panel is probably the best answer to the problem of tool care; but in a shop as large as that

at Roosevelt the toolroom is recommended. This room is probably the most difficult one to plan, for it must be neither too large nor too small. The size will be largely dependent upon the method of tool distribution and the tools that must be handled. For ease of checking, the tools should be assigned a particular place, designated by contrasting silhouette or fitted rack so that a missing tool is immediately noticed. The room should be small enough so that few steps are necessary to give quick service, yet large enough to provide a place for every tool. It should never be necessary to pile tools upon each other. The partition between the toolroom and the shop should be waist high with glass above, so that the instructor may have full view of the activities of the room. If ventilation is a problem, heavy wire mesh may be preferred to the glass.

Regardless of how tools are kept, it is essential that the storage place be kept clean. Inaccessible nooks and waste spaces should be avoided. Hand bellows and a desk brush should be kept at a convenient place in the toolroom for cleaning shelves, panels, and drawers. Space under cabinets and drawers should be completely enclosed or accessible for thorough cleaning with a floor brush.<sup>1</sup>

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<sup>1</sup>G. H. Silvius and H. J. Johnson, "Tool Storage: A Place for Everything and Everything in Its Place," Industrial Arts and Vocational Education, XXX (September 1945), p. 276.

It is important that the teacher keep the following points in mind when planning tool storage in a shop:

- Accessibility and convenience.<sup>1</sup>
- Ease of checking
- Security of tools
- Orderliness and cleanliness
- Safety

If the toolroom is arranged so that there is room for the tools at a convenient level, there will be far less danger of tools falling because they were not properly placed; and if they do fall, the danger to the toolman is far less than if the tools were kept high on the wall or overhead where neither convenience nor safety are considered.

Planning Room. One of the objectives of the comprehensive high school is to train the student in planning his actions from carefully collected data. To make this more possible, a planning center is necessary. If possible, this should be an individual room separated from the shop by glass so that it may be supervised more readily by the busy teacher. It might be large enough to be used as a study room for arts and crafts students, thereby making it possible to have teacher supervision within the room. It should still be flexible enough to be of value to the entire department. Books on design and

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<sup>1</sup>Ibid., p. 278.

planning should be readily accessible, and cases should be provided for exhibiting projects worthy of note. Tables with movable chairs are more useful for the planning room than the fastened chair-desk combination.

Finishing and Gluing Room. The finishing and gluing can be done satisfactorily in the same room. This combination seems to be the best, for they both need a controlled temperature at about 75 degrees, which is too hot for the rest of the shop. Metal-topped tables are more satisfactory here, and the room must be dust-free. The portion used for finishing should have north exposure so as to avoid direct sunlight. The room should not be less than twelve by fifteen feet of usable space; and if an effective exhaust fan is not available, the room must be considerably larger. Metal cabinets for paint supplies and drying shelves should be provided.

Welding and Forging Areas. If welding instruction is to be offered in the metal shop, special booths should be planned so that no one needs to work in the brilliant, flashing light. Both the welding and the forge work should be adequately ventilated, for the school must furnish healthy places to work regardless of cost or convenience.

Shop Office. The need of an office for the shops is well presented by Mays in the following quotation.

Every shop teacher needs a place for a private desk where he can keep his records, supply and equipment catalogs, private professional books, and other things which need to be locked away when he is out of the room. He also needs a place for private conferences with pupils and others. If possible, such office space should look out over the shop by means of a window or glass door. But wherever located, it is an important room and should never be left out of plans for new shop buildings. It is probable that the shop teacher has greater need for an office than has any other teacher on the staff because of the large amount of equipment and supplies under his care. This responsibility is of course in addition to the usual record keeping required by all teachers.<sup>1</sup>

There need be little added to point out the desirability of a private spot for the instructor, but it might be well to suggest that this office might be shared with the instructor of an adjoining shop if it were placed between the shops. This room, storage rooms, and finish rooms are often placed between shops, thereby helping to insulate one shop from the noise of another.

At present there is a very inadequate photographic dark room that is walled off the toolroom of the shop at Roosevelt. With the small amount of equipment available, there has been a surprising amount of interest. The original plan was to photocopy transcripts and the like, as well as build up a hobby club, but the transcript idea

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<sup>1</sup>William G. Darley, "Seeing in the Schoolhouse," Industrial Arts and Vocational Education, XXXV (April 1946), p. 156.

has been shelved. There is quite a growing group interested in using the enlarger and the printing equipment. In the new building program there should certainly be at least a small darkroom to handle the needs of copying and blueprinting for the departments. There has been no indication that there will be enough demand to justify a full class, but there should be ample space for tables, a sink with drain boards, and cupboards for the papers, chemicals, and other materials.

#### Lighting

According to the Portland School Modernization plan, there is hardly a schoolroom in the city that has adequate light to meet modern standards. This is especially true of the rooms at Roosevelt. There need be little said to convince an experienced shop teacher of the need of sufficient light for safety in operation of the machines and hand tools, to say nothing of the protection against eyestrain.

Today some recognition of the differences in the ability of different eyes to see is noted by the establishment of sightsaving classrooms for those whose vision is or has become so defective that normal classroom tasks are below the sustained threshold of the student even fitted with eyeglasses. (Actually, the purpose of the sightsaving classroom is to preserve what is left to some students of their precious gift of sight. And this is a good thing. But

the place to save sight is in the regular classrooms where there may be good sight to save.)<sup>1</sup>

We are not concerned here especially with "sight-saving" classes, but we must realize that we must at least take care of the eyes of the future machinists, carpenters, artists, seamstresses and all who attend our school.

The following table indicates the approved or recommended illumination for various types of work and the illumination now available at Roosevelt on an average cloudy day. On clear days the light is only slightly better because shades must be drawn to keep out the glare. On dark days the light falls way below the data given.

Foot Candles Recommended*	Use of Light	Foot Candles at Roosevelt
20	Own handwriting in pencil	2 - 20
30	Reading textbooks	5 - 20
35	Bookkeeping	15
40	Drafting	8 - 35
65	Medium assembly and inspection	5 - 30
80	Metal buffing	5
100	Sewing	30
180	Using scale to 1/64"	75
200	Fine sanding and finishing	75

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<sup>1</sup>William G. Darley, "Seeing in the Schoolhouse," Industrial Arts and Vocational Education, XXXV (April 1946), p. 156.

\*M. Luckiesh, Light, Vision and Seeing, (D. Van Nostrand Co., 1944), cited by Darley, op. cit., p. 156.

The only place with adequate light in all rooms checked was in the direct light within a few feet of the windows.

It should be noted that the amount of light is not the only factor in proper lighting. The elimination of glare and also the evidence of shaded spots are vital. A person is in no condition to work until he adjusts to the change. One way to help this matter is in the proper painting of the rooms. It has been found that the use of light green ceilings, slightly darker green upper walls, changing to slightly darker lower walls is far more restful to the worker than cream or other light color. Dark paint should not be used on machines, especially at the danger spots. Such places should be painted so as to call attention to the hazard.

If possible one-fourth of the floor space should receive natural light. Fluorescent lamps are probably the best solution to the problem of achieving even lighting, though fixtures with good reflectors and a frosted glass cover to diffuse the light can be used if installation costs have to be considered.

### Ventilation

The problem of proper ventilation is one that calls for the aid of a person trained to meet the problem. The following will be interesting to note:

.....The major problem involved in ventilation is to prevent 'stuffiness' or 'closeness' which is caused by body odors and not by poisons from the lungs as is commonly believed. . . . in those classrooms where the children are from the very poor families, where bathing and change of clothing are infrequent, more than twice as much air has to be provided to keep the room in proper condition than is the case where the children are from homes where frequent baths are the rule.<sup>1</sup>

The need of ventilation is especially noted in rooms where vigorous activity takes place or in the finishing room or about the welder or forge, where special ventilation arrangements should be made. Mays emphasizes the point that because of the technical problem involved, a specialist should be insisted upon, but that an alert teacher can usually prevent any serious conditions of bad air.

### Flooring

The floors should be planned for the type of shop. A poorly planned, vibrating floor can have a very tiring effect on the students and the instructor. Wood floors in the welding or foundry area would be a fire hazard.

Expensive though it is, battleship linoleum will help greatly to reduce the noise and keep the homemaking and the

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<sup>1</sup> Mays and Caseberg, op. cit., pp. 26-27.

drawing rooms neat. Vertical grained flooring is to be preferred to concrete except in the ceramics area, where concrete is easier to clean. The machines must be securely anchored in concrete to absorb the vibration. These mountings should be adequate to meet the changing shop equipment. To avoid this restrictive feature, the best solution is to have the wood floor laid in mastic on concrete.

The foundry area should be floored with tamped molding sand so as to avoid the spattering of hot metals in concrete.

## CHAPTER V

### CONCLUSIONS

In order to meet the needs of the community as a comprehensive high school, Roosevelt should work toward a plan which will divide the present gymnasium wing into classrooms. A new wing should be added to include the art, industrial-arts, and homemaking departments, and another to house an expanded physical education department.

The arts and homemaking wing should include at least three shops: 1) a general wood-shop, 2) an electric shop, and 3) a metal shop. There should be two drawing rooms, one for beginning mechanical drawing and the other for machine and architectural drawing.

The art department should have two rooms for general beginning classes, a room for the crafts, and one for advertising or commercial art. There should be one room for art-metal work which would be more properly included in the industrial-arts group.

The homemaking department should include two cooking rooms and two sewing rooms, with an additional room for home demonstration. Each group of rooms should have adequate storage and locker space, and there should be two additional classrooms available for instruction purposes other than laboratory work. One or both of these rooms

should be easily darkened for motion-picture projection and a machine should be available at all times. One of these rooms should include a planning center with library tables and display cabinets.

The following are cautions to the planners, cautions which might serve as a check list of things that should not be overlooked:

1. All parts of each room should be visible from the teacher's desk. Glass partitions should separate auxiliary rooms from the main room or shop.
2. Teachers' offices should be provided where they can overlook the entire room.
3. Conference rooms should be provided.
4. Each shop should have a master switch near instructor's desk for the machines.
5. Placement of machines and benches should be planned with regard to their use and to furnish adequate aisles and working areas.
6. Noisy shops should be soundproofed.
7. Wood or linoleum floors should be provided with separate concrete footings to mount vibrating machines.
8. Each room or shop should have adequate storage space for materials and for projects, preferably in auxiliary rooms so arranged as to minimize loss.
9. Shop supply lockers should be arranged for convenient use.
10. No "catch-alls" should be permitted.
11. Adequate-sized entrances should be provided to admit materials, projects, and furniture easily.

12. Toolrooms should be small but adequate for tools needed.
13. Auxiliary rooms should not cut up the main shop room into odd shapes.
14. Proper provision for inflammable material should be made.
15. Lighting and ventilation should be carefully engineered for the students' benefit and not for cost alone.
16. Light-colored, easily-cleaned paint should be used on upper walls and ceiling.
17. Rooms needing best light should have north exposure.
18. Exhibit cabinets and display boards should be planned.
19. Ample demonstration area with blackboards available should be provided.
20. Planning should be with consideration of the student first, cost second.

There is little doubt that the present room and equipment conditions at Roosevelt High School are far from satisfactory for a comprehensive high school. There is little doubt that the necessary improvements will be costly and involved and should, therefore, be carefully planned with every suggestion considered before actual work is started.

This paper has presented the general needs, the specific needs, and closes with a brief summary of those needs as they apply to Roosevelt High School, with a hope that they can be of service to those who will actually design the rejuvenated school.

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**APPENDIX**

## ARTS AND INDUSTRIAL ARTS QUESTIONNAIRE

To better plan the needs of Roosevelt High School Arts and Industrial Arts Program this questionnaire has been prepared. To make it of greatest value it will need your careful consideration. Please be accurate; BE BRIEF.

How many terms have you had the following:

Art \_\_\_\_\_ Shop \_\_\_\_\_ Mech. Dr. \_\_\_\_\_ Home Making \_\_\_\_\_  
 Typing \_\_\_\_\_

How many more terms would you take if you could?

Art \_\_\_\_\_ Shop \_\_\_\_\_ Mech. Dr. \_\_\_\_\_ Home Making \_\_\_\_\_  
 Typing \_\_\_\_\_

What occupation do you intend to follow?

1st choice \_\_\_\_\_ 2nd \_\_\_\_\_ 3rd \_\_\_\_\_

What hobbies do you enjoy?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

What hobbies would you like to take up if you knew how to get started?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

If home equipment needs repair who does the repairing?  
 (Such as roof leaks, faucet leaks, wire wear out, etc.?)

Would you do it if you knew how? All \_\_\_\_\_ Some \_\_\_\_\_  
 None \_\_\_\_\_

Father's occupation \_\_\_\_\_ He was trained for  
 \_\_\_\_\_ Hobby \_\_\_\_\_

Mother's occupation \_\_\_\_\_ She was trained for  
 \_\_\_\_\_ Hobby \_\_\_\_\_

Best adult friend's occupation \_\_\_\_\_

Trained for \_\_\_\_\_ Hobby \_\_\_\_\_

If the following were offered at Roosevelt which would you like to take:

Sheet Metal \_\_\_\_\_ Art Metal \_\_\_\_\_ Plastic Craft \_\_\_\_\_

Leather \_\_\_\_\_ Machine Shop \_\_\_\_\_ Machine Dr. \_\_\_\_\_

Ceramics \_\_\_\_\_ Poster \_\_\_\_\_ Electric Shop \_\_\_\_\_ Stage

Construction \_\_\_\_\_ Block Printing \_\_\_\_\_ Silk Screen

Printing \_\_\_\_\_ Wood Carving \_\_\_\_\_

## QUESTIONNAIRE RESULTS

Occupational Interests at Roosevelt High School

	Choice				Choice		
	1st	2nd	3rd		1st	2nd	3rd
Accountant	4	3	4	Fish Culture	4		
Art	11	6	2	Fireman		3	
Architect	27	8	6	Florist	6	5	3
Army	15	5	3	Flying	28	5	
Barber	3		1	Forestry	29	13	4
Bar Tender	4			Grocery	5		2
Beautician	9	11	2	Guide		2	3
Boat Builder	4	1	3	Hairdresser		2	
Boat Pilot	2			Housewife	49	27	28
Bulldozing	1			Illustrator	12	5	
Burner	3	1	2	Interior			
Business	5	9	6	Decorator		2	1
Bus. Machine				Journalism	8	12	5
Repair	2			Lab. Technician		3	7
Buttermaker	1	2		Laborer			2
Butcher	7	4	3	Landscaping		2	
Buyer	5	3	2	Laundry			2
Candy Dipper	1		2	Lawyer	13	14	9
Carpenter	12	16	9	Librarian		3	2
Chauffeur	2			Linguist	8	2	1
Chemist	1	3	1	Logger		2	
Clerk	5	17	9	Lumbering		3	2
Coast Guard	5	7	3	Machinist	9	14	9
Comedian	3	1		Mail Carrier		2	
Custodian		1		Marriage		3	2
Dancer	2		1	Mechanic	14	22	9
Designer	9	6	7	Medicine	36	12	
Detective	4			Merchant Marine		3	
Dietitian		3		Ministry	21	12	3
Diver	1		2	Music	12	13	11
Dramatics	3		3	Navy	42	23	12
Drawing	18	25	13	Nursing	62	36	3
Druggist	3	4	6	Office Work	14	17	2
Egg Candler			1	Own Business	3		1
Electrician	9	11	4	Painter	9		4
Engineer	41	32	14	Photographer	15	3	2
Fashion Designer	14	6	3	Physics		2	1
Farming	34	15	12	Physical Ed.		4	5
F.H.A.		1		Pianist	1		
Fishing		3		Pipe fitter		1	

	Choice				Choice		
	1st	2nd	3rd		1st	2nd	3rd
Plasterer		2	2	Sheet Metal	2		3
Plumber		2	1	Ship Chandlery	8		2
Plywood Mfg.			2	Ship Building	2	2	
Postman	8			Show-work	14	8	3
Presser	8	2		Singer	2		
Proprietor	2		3	Social Worker	8	4	3
Public Admin- istrator		2	2	Stenographer	98	65	14
Radio	7	2		Storekeeper	4		2
Radio Repair		5		Superintendent		1	
Railroad	12	3		Teacher	46	21	9
Ranger	4			Telephone Operator	5	3	2
Real Estate	3			Theatre	6	3	1
Recreation Director		2	1	Truck Driver			2
Repair Man	3			Typist	14	7	
Restaurant			3	Waitress		3	
Saleslady	4		3	Watchman			2
Salesman	14	12	8	Welder	9	3	
Secretary	103	107	83	Woodworker	16	8	4
Scientist	9	8	7	Woolen Mills	2		2
Service Station	5		1	Writing	2	1	1
Sewing	5			X-Ray	1		

### Results Classified

(When the above choices were classified according to the departments in school the following was totaled.)

	Total	1st	2nd	3rd
Commercial	683	289	243	156
Industrial Arts	597	287	196	114
Art	188	90	64	34
Home Making	191	87	56	48

Hobby Interests at Roosevelt High School

(Column 1 lists number participating in hobby)

(Column 2 lists number that would like training for hobby)

	1	2		1	2
Adventure	4		Housework	16	
Airplanes	28	8	Hiking	45	
Archery	23	4	Hunting	137	17
Art	37	17	Ice Skating	36	47
Art Metal	9	23	Jewelry	3	2
Auto Mechanics	22	9	Knitting	12	14
Baseball	140	18	Leatherworking	8	23
Basketball	163	7	Memory Book	3	
Bicycling	42		Model Making	63	3
Block Printing	3	7	Movies	36	
Boating	123	5	None	23	
Boat Building	4	2	Music	143	
Bowling	87	42	Needlecraft	4	3
Boxing	9		Nursing	8	
Cards	3		Painting	23	14
Carpentry	56	5	Penny Collecting	9	
Cars	86	17	Photography	80	92
Car Repair	14	12	Piloting	1	3
Carving	8	9	Piano	31	
Ceramics	3	18	Ping Pong	24	
Chemistry	27	16	Poetry	9	
Collecting (Misc.)	204	27	Pool	23	3
Cooking	44	4	Reading	64	
Crocheting	4		Record		
Dancing	423	32	Collecting	24	
Dramatics	24	8	Riding	21	
Drawing	121	9	Roller Skating	63	
Electricity	14		Sewing	123	27
Embroidery	14	3	Singing	49	25
Exploring	2		Skating	163	65
Fishing	152	45	Skiing	109	84
Flying	41	9	Sports	234	33
Fly Tying	4	9	Stamp		
Football	64	3	Collecting	87	
Furniture	2		Swimming	253	84
Gardening	12	8	Stenography	13	
Girls	24	9	Taxidermy	11	
Golf	13	8	Tennis	83	75
Hockey	9		Trapping	5	
Horseback					
Riding	65	4			

New Courses Desired at Roosevelt High School

The following list the number who would like to take the listed courses if they were offered.

Art Metal	211	Plastic Craft	462
Block Printing	264	Poster Making	209
Ceramics	178	Sheet Metal	306
Electric Shop	421	Silk Screen	212
Machine Drawing	219	Stage Construction	286
Machine Shop	453	Wood Carving	297