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The Correlations and Validity of Selected Community College Curriculums to Graduate Placement in the Industrial Occupations Within Selected Graphic Arts Companies in The United States

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THE CORRELATIONS AND VALIDITY
OF SELECTED COMMUNITY COLLEGE CURRICULUMS
TO GRADUATE PLACEMENT IN THE INDUSTRIAL OCCUPATIONS
WITHIN SELECTED GRAPHIC ARTS COMPANIES
IN THE UNITED STATES

by

Howard G. Rose

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Science in the School of Printing
in the College of Graphic Arts and Photography
of the Rochester Institute of Technology

May, 1975

Thesis adviser: Associate Professor Joseph I. Noga

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ABSTRACT

The purpose of this investigation was to question the validity of community colleges' occupational goals for graphic arts programs in the United States. To accomplish this, a statistical investigation was designed to either accept or reject the hypothesis of the thesis, which was: If a community college's educational objective in a graphic arts program is to prepare the student for a specific occupational area and level of occupation in the graphic arts industry, then upon successful completion of the program, a personnel director of a graphic arts firm would hire the student for that area and level of occupation for which he was trained.

Approximately 100 community colleges in the United States were contacted. The survey included those schools awarding an Associate of Arts, an Associate of Science, or a diploma/certificate in graphic arts. The directors of the graphic arts programs were asked about the occupational positions that the school's curriculum prepared students for after graduation. They were asked to select the positions from a list sent to them.

Another question asked of the community college directors concerning graduates of their program was about the positions that the majority of their students had entered upon graduation. The responses were checked on the same list of occupations. These two lists should correlate highly if the occupational goals of the program were accurate in relation to

actual conditions and manpower requirements.

The school catalogs were also obtained from the directors. The majority of the graphic arts programs were summarized into three representative programs: one program for the technical aspects of printing, one program for the technical/management aspects, and one representing all the one to one-and-a-half year certificate programs. The occupational goals for each of the three programs were kept separate.

The three programs were shown to a random sampling of printing firms across the country. The personnel directors were asked what occupational positions graduates of the three curricula are qualified to fill. They were then asked to check the occupation from the same list presented to the community college directors. Ideally, the lists from the community college directors and the personnel directors should be the same. If this is true, then the hypothesis is true. If there is a significant difference between the responses, then the hypothesis is false, showing that the goals of community college programs are not realistic and valid.

The conclusions of the research were contrary to much of the published information on community college graphic arts programs. Using Pearson's Product Moment Correlation Coefficient and a significance level of 0.05, the hypothesis was accepted. That is, students were in general being hired for those positions professed to be occupational goals of the curricula. This was true for all three representative programs.

Abstract approved: Joseph L. Noga, thesis adviser
Associate Professor, title and department
June 5, 1975, date

I. INTRODUCTION

Statement of the Problem

Graphic arts education at all levels has come under attack in recent years from various sources.¹ The major criticism is the curriculum's lack of relevancy, accuracy in course content, and course goals compared to the actual industrial conditions.² Students should not enter a program believing that, upon graduation, they will be estimators when in reality, the printing industry will hire them only as pressmen. The community college graphic arts instructor has a responsibility to his students to make the course goals and curriculum as valid as possible. This thesis has attempted to evaluate how correct the occupational goals of the community college graphic arts programs are and how well the goals and actual graduate placement correlate overall. The validity was determined by a comparison of the community college occupational goals of the program, as determined by the directors of the programs, and the opinions of personnel directors of graphic arts firms as to the occupational potential of graduates of such programs.

The underlying reason for this thesis was to gain an insight into community college graphic arts programs across the country. A broad understanding of certain facets of community college education can be gained through the process of investigating the data needed to answer the main purpose of the thesis.

In what graphic arts positions have the majority of the students

entered? Ideally, the occupational goals of the program and the placement of students of that program should correlate highly. If not, the students are not receiving the education, background, and credentials they are expecting. The directors of graphic arts programs were asked their opinion about their community college as a viable manpower source. Industry was asked to judge community colleges' role as a manpower source; this information is another facet that will aid in the understanding of community college graphic arts education in the United States.

Scope

The results of the study are relevant to all parts of the country. All the community colleges listed in Kodak's "A Survey of Motion Picture, Still Photography, and Graphic Arts Instruction," and the booklet "Technical Schools, Colleges and Universities Offering Courses in Graphic Communications," published by the Educational Council of the Graphic Arts Industry, Inc., were contacted. These community colleges constitute most of the schools offering an Associate of Arts, an Associate of Science, or a diploma/certificate in graphic arts in the United States. Graphic arts firms across the country were contacted for their opinions of community college curricula and graduates of these colleges. Both the colleges and printing firms were contacted by mail, which, while not the best research tool, allows the scope of the study to be nationwide.

General Characteristics

The thesis involved two mail questionnaires, personal interviews, and a summarization of the community college curricula as stated in school catalogs. The directors of all the community colleges were sent a mail questionnaire and a request for a school catalog. All the graphic arts programs were summarized into three representative curricula, which are listed in Chapter III. These programs were then presented to the personnel directors of the sample population of printing firms. These firms were selected at random from telephone books across the United States.

The directors were asked what occupational positions graduates of such programs would be qualified to assume. The results were correlated with the positions that the students were actually entering. Another group of personnel directors was also queried. This was a control group of twelve printing firms in New York City that responded to the questionnaires in personal interviews with the author. The purpose of this group was to provide responses which would correlate with the responses of the mail responses as a validity check on the results.

Reasons for Interest in the Problem

As part of a complete curriculum, information about job possibilities and industrial occupations is important and necessary. An instructor needs to know the validity and relevancy of the goals of his program and if these goals are in line with actual job possibilities for his students. Many industrial sources and different literary sources indicate that community colleges' goals are irrelevant and inaccurate.

As a potential community college instructor, the author wanted to find out if the community colleges' occupational goals for the students coincide with the opinions of representatives from the graphic arts industry. This thesis is designed to give insight as to the validity of the community colleges' occupational goals of community colleges in the United States.

FOOTNOTES FOR CHAPTER I

¹Howard Mossman, "Talk Time is Over . . . It's Action Time Now on Manpower Recruitment and Training!" Share Your Knowledge (April 1971), p. 3

²Karen Ibrahim, "Graphic Arts Education Continues to Be a Victim of Apathy," Graphic Arts Progress, Vol 17, No 7 (July 1970), p. 7.

³Ibid.

II. THEORETICAL BASIS FOR THIS THESIS

A basic tenet of community college philosophy centers around occupational-vocational education.¹ Occupational-vocational education as discussed in this thesis refers to "courses of two years' duration or less combining the development of skills required for entry into a locally important occupation with related knowledge and theory calculated to help the student progress on the job."² As more and more community colleges are established across the nation, the responsibility for occupational-vocational education is becoming a major role of the institutions.³ The occupational-vocational programs are designed to satisfy industrial manpower needs and, at the same time, prepare students for viable positions in their chosen fields.

At the present time, there are approximately one hundred two-year institutions across the nation awarding an Associate of Arts, an Associate of Science, or a diploma/certificate in graphic arts.^{4,5} These curricula are designed to help satisfy the needs for technologically trained personnel in the graphic arts industry. This source of manpower is extremely important to the industry in light of the great technological changes that graphic arts has made and is making.⁶ This is with the realization that more skilled and semi-skilled labor is needed to compliment the new hardware presently being used and developed. Ideally, the community college is designed to be flexible so that its courses equal or exceed new industrial innovations and technologies.⁷

Current Status of Community College Graphic Arts Education

Ideal states are not always achieved in reality. Much criticism of
 8
 all forms of graphic arts education has been voiced in recent years.
 Typical of such literature is the series of articles published over a
 9, 10, 11, 12
 three-year period in Graphic Arts Progress. In addition to
 commenting about industrial responsibility, in 1967, Graphic Arts Pro-
gress discussed graphic arts education in the high schools and colleges.
 The opinion expressed in Graphic Arts Progress was that graphic arts
 education in the United States was less than satisfactory due to a myriad
 of factors. In 1970, Graphic Arts Progress published an editorial com-
 ment about the progress that graphic arts education had made over the
 three-year period. The title "Graphic Arts Education Continues to Be a
 Victim of Apathy" reveals the mood of the article. The author claimed
 that "the gap between rhetoric about educational goals and achievement
 13
 of them seems to be widening." The goals of community college graphic
 arts programs are based on manpower needs in the industry and the col-
 14
 lege's ability to prepare students to meet these needs. In order to
 accomplish this goal, the community college must be realistic about the
 positions that graduates will hold. That is, will the graduates be
 hired and be effective in those positions for which the program was de-
 15
 signed?

Evaluating the Curriculum

The previous discussion has revealed a major problem in education:
 evaluating a curriculum. Much activity is spent in designing a curricu-
 lum: community surveys are employed, lay committees are formed, research

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into economic factors is performed, etc. But very little evaluation is undertaken after a program is instituted. The primary reason may be that there are few clear criteria of educational effectiveness. In the absence of evaluative evidence, substitutes are used: educational ideology, sentiment, persuasive claims by salesmen, etc.

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A major criterion in evaluating community college graphic arts programs is the effectiveness of the curriculum. "Are the graduates employed in the positions for which they have been trained?" This form of evaluation emphasizes the human aspect: the students. A program is designed to aid students in the future. Development and evaluation of curricula should center around their effect on the students first, and on the other factors second.

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At present, the only method of finding out if students are being hired for positions for which they were trained is to investigate the students who graduated. The opinion of those responsible for hiring employees is needed in order to determine if students are adequately prepared to enter occupational positions for which they were trained.

This Thesis as a Method of Evaluation

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This thesis is an example of formative evaluation in which "surveys and questionnaires are used to find judgment regarding the success of a plan or curriculum." It attempts to evaluate whether the graphic arts programs at community colleges are adequately preparing students for the occupational areas and levels for which they claimed to be training them.

Ideally, the hypothesis of the thesis will be true: If a community

college's educational objective in a graphic arts program is to prepare the student for a specific occupational area and level of occupation in the graphic arts industry, then upon successful completion of the program, a personnel director of a graphic arts firm would hire the student for that area and level of occupation for which he was trained. A rejection of the hypothesis implies that the goals of a curriculum are not realistic in relation to the actual course work of the program in the opinion of industrial personnel managers. Claiming to train managers and sales personnel when the majority of the graduates are hired as pressmen and strippers is nothing less than false advertising that hurts not only the school but, more importantly, the students. Acceptance of the hypothesis implies that the occupational goals of the program are accurate and that, in general, students can and will obtain jobs specified as program goals. The results of this study apply to community colleges as a group and is a barometer of specific colleges and their local industry. Through this nationwide investigation of the accuracy of occupational goals and a survey of local industrial conditions, a director should be able to realistically define the occupational expectations of graduates from his program.

FOOTNOTES FOR CHAPTER II

¹Ralph R. Fields, The Community College Management (New York: McGraw-Hill Book Company, Inc., 1962), p. 8.

²James W. Thorton, Jr., The Community Junior College (New York: John Wiley & Sons, Inc., 1966), p. 60.

³Ibid., p. 64.

⁴C. William Horrell, "A Survey of Motion Picture, Still Photography and Graphic Arts Instruction," Eastman Kodak Company publication T-17, Rochester, New York, December 1971.

⁵Education Council of the Graphic Arts Industry Inc., "Technical Schools, Colleges and Universities Offering Courses in Graphic Communications," 1970.

⁶Karen Ibrahim, "Graphic Arts Education: Colleges Face the Challenge," Graphic Arts Progress, Vol 14, No 7 (October 1967), p. 11.

⁷Thorton, p. 60.

⁸Howard Mossman, "Talk Time is Over . . . It's Action Time Now on Manpower Recruitment and Training!" Share Your Knowledge (April 1971), p. 3.

⁹Karen Ibrahim, "Graphic Arts Education: Confusion in the High Schools," Graphic Arts Progress, Vol 14, No 6 (September 1967), pp. 3-7.

¹⁰Ibrahim, "Graphic Arts Education: Colleges Face the Challenge," Graphic Arts Progress, pp. 5-15.

¹¹Karen Ibrahim, "Graphic Arts Education: Industry's Responsibilities," Graphic Arts Progress, Vol 14, No 8 (November 1967), pp. 4-15.

¹²Karen Ibrahim, "Graphic Arts Education Continues to Be a Victim of Apathy," Graphic Arts Progress, Vol 17, No 7 (July 1970), pp. 7-10.

¹³Ibid., p. 7.

¹⁴Ibrahim, "Graphic Arts Education: Colleges Face the Challenge," Graphic Arts Progress, p. 9.

- ¹⁵Thornton, p. 168.
- ¹⁶B. Lamar, Starting a Community Junior College (Washington, D.C.: American Association of Junior Colleges, 1964), pp. 8, 15.
- ¹⁷B. Camar Johnson, Islands of Innovation Expanding: Changes in the Community Colleges (California: Glencae Press, 1969), pp. 304, 307.
- ¹⁸Thornton, p. 168.
- ¹⁹James W. Reynolds, The Comprehensive Junior College Curriculum (California: McCatchar Publishing Corporation, 1969), p. 141.
- ²⁰Ibrahim, "Graphic Arts Education Continues to Be a Victim of Apathy," Graphic Arts Progress, p. 8.
- ²¹Johnson, p. 307.

III. METHODOLOGY

The research process basically gathers information about a system (community colleges), summarizes the data into general characteristics and conditions, and then presents the information to another system (industry) for its opinion of the first system.

The system to be understood and summarized is comprised of all the community colleges in the United States offering an Associate of Arts, an Associate of Science, or diploma/certificate in graphic arts. Certain information is needed from the community colleges in order to be able to effectively and accurately present actual conditions in these curricula to the graphic arts industry for its opinion and thereby prove or disprove the hypothesis of the thesis.

What is the general nature of the program? What type of courses are offered and what is the course content? Before a personnel director of a printing firm can be asked to evaluate community college programs, he should be informed as to what is contained in a typical curriculum. An examination of several school catalogs of community colleges offering graphic arts programs revealed that most programs can be grouped into three typical curricula. The community college programs were summarized into typical curricula and these programs were presented to industrial representatives for evaluation. The curricula are presented on page 19.

For what general occupational positions are the community colleges

preparing students? In what graphic arts occupational positions have the majority of the students entered upon graduation? The community college program is set up to effectively prepare students for certain job areas. This research will attempt to discover what these areas are, and if graduates are going into jobs for which they were trained. Ideally, the occupational goals of the curricula and the actual positions of graduates should correlate highly. This would illustrate the effectiveness and relevancy of the program. If the program's goals are to train foremen and the majority of graduates become pressmen, then the curriculum needs re-evaluation and new directions.

Do the directors of the community college graphic arts curriculum feel that their programs are satisfying industrial manpower needs? While this data was not presented to industry, it was correlated with the opinions of personnel directors of graphic arts firms in reference to the role of community colleges as manpower sources. While this information is not needed in evaluating the primary hypothesis, the results of comparing the two viewpoints aid in the overall objective of the thesis which is to understand and evaluate community college graphic arts programs in the United States.

Two methods were used for the data collection from community colleges: a mail questionnaire (Appendix A) and an examination of the school catalog. All the community colleges in the United States offering an Associate of Arts, an Associate of Science, or a certificate/diploma in graphic arts were sent a questionnaire and a request for a school catalog. The names of the community colleges were selected from "A Survey of Motion Picture, Still Photography, and Graphic Arts

Instruction," and "Technical Schools, Colleges and Universities Offering Courses in Graphic Communications."^{2,3} The questionnaire and request for catalogs were sent to the directors of the graphic arts programs at the community colleges. In this position, the director is the most qualified to answer the questions and, if necessary, to know where the information could be obtained.

To understand what types of courses are offered and what is the course content of the programs, the school catalog of each community college was examined. After examination of the school catalog, a pattern was detected and the majority of the curricula could be classified into three categories. These representative programs were used to compare occupational goals and actual, future job possibilities. These job possibilities have been decided by personnel directors of the printing firms interviewed.

While arguments can be made as to the lack of correlation of the description in the catalog to the actual situations in the classroom, the catalog will be the same information source a potential student will use, and more importantly, it is the only source open to most employers.⁴ It is for this reason that the results and conclusions of the thesis were partly based on this sometimes unreliable source.

The directors of the community colleges were asked two questions about their graduates. First, those interviewed were asked to select from a list of graphic arts positions, those jobs for which their program is preparing students. Secondly, the same list was used for the question, "In what general occupational positions in the graphic arts industry have the majority of your students entered upon graduation?"

Those interviewed were asked to place numbers before each item to arrange them in the order of relative number of students in each area.

The last area concerns the directors' opinions of the success of their graphic arts programs. They were asked, "Do you feel your program satisfies industry's manpower needs?" and were presented with a list of levels of satisfaction: highly satisfies, satisfies, sometimes satisfies, rarely satisfies, and does not satisfy at all. This question should indicate the community college director's opinion of his program in relationship to manpower needs.

Analysis of the Community Colleges' Questionnaires

The population studied was small: 95 community colleges. Because of this, repeated mailings and reminder cards were used to insure a high return of the questionnaire. No statistical computation was needed to determine the correct number of schools to be sampled because 100 percent of the population was sampled.

The directors of the graphic arts programs at community colleges were asked to select those general occupational positions for which their program trains students. They were asked to check off those positions from a list presented to them with the possibility of adding other positions not listed. The list was as follows: pressmen, strippers, platemakers, estimators, cameramen, managers, typesetters, bindery, salesmen, foremen/supervisors, and others. The next question concerned what general occupational positions in the graphic arts industry the majority of students have entered upon graduation. The above mentioned list was again presented to the directors, and they placed numbers before each

position so as to arrange them in order of relative number of students in each occupation. The results of these two questions were statistically correlated by use of Spearman's Rho.⁵ This formula calculates "r" from data in ranked form. The formula is

$$r = 1 - \frac{6 \left[\sum (R(x_i) - R(y_i))^2 \right]}{n(n-1)}$$

where: r represents Spearman's Rho, the coefficient of correlation,
 x represents the rank of a specific occupation selected in Question 3 of the questionnaire mailed to community college directors,
 y represents the rank of a specific occupation selected in Question 2 of the questionnaire mailed to community college directors, and
 n represents the number of occupations.

This correlation is presented in the conclusion in conjunction with the community college's industrial correlations of placement of graduates of a graphic arts program, and will aid in the evaluation of the accuracy of the goals of graphic arts programs at community colleges. That is, since there should be a high correlation between the occupational goals of a program and actual placement of graduates of such a program, a correlation which is not statistically significant indicates that the occupational goals are unrealistic and can be misleading to students.

Pearson's Product Moment Correlation Coefficient was used to ascertain the coefficient of correlation, "r", of this data.⁶ The Pearson formula calculates "r" from data in percentile form. That is, for the

first item in this list, pressmen, the percent of directors selecting pressmen as an occupational goal of the program can be compared with the percent of personnel directors stating that pressmen is one of the areas that students could be employed in after graduation. The rest of the list is compared in the same manner. The formula takes this ordered, compared data and produces the coefficient of correlation. The formula is included later in this chapter.

The only analysis needed for the question concerning the directors' opinions of their programs as a manpower source is a summarization of the data into percentile form. The results are stated in the conclusions and are included as added information for the reader in his evaluation of community college graphic arts programs.

In order to prove or disprove the hypothesis of the thesis, information from personnel directors of graphic arts firms from all over the country was needed. This information was obtained in the form of opinions of the material presented to them. (This material was obtained from the community colleges offering graphic arts.) The personnel directors were presented with three curricula summarized from the school catalogs (see Appendix B.) For each curriculum, they were requested to select from a list of occupations those positions graduates of such a program would be qualified to fill. This list was the same as that presented to the directors of the graphic arts programs at the community colleges surveyed. These two lists were correlated by using the following statistical procedures.

Pearson's Product Moment Correlation Coefficient

$$r = \frac{\sum (X_i - \bar{X}) (Y_i - \bar{Y})}{\left[\sum (X_i - \bar{X})^2 \sum (Y_i - \bar{Y})^2 \right]^{1/2}}$$

where: r represents the coefficient of correlation,

X represents the percentage of directors of the graphic arts programs in the community colleges who select a specific occupation for a graduate of his program,

Y represents the percentage of personnel directors of the printing firms surveyed who selected a specific occupation for a graduate of a curriculum similar to the curriculum involved with the one with X,

\bar{X} represents the average percentage of all the occupations selected by the directors of the graphic arts programs, and

\bar{Y} represents the average percentage of all the occupations selected by the personnel directors of all the printing firms surveyed.

The curricula, which are the bases of the correlations, are summaries of graphic arts programs of all the community colleges responding to the mail questionnaires and the requests for a catalog. This was an 83% return of information with 79 out of 95 institutions answering. The first curriculum represents those colleges with programs leading to an Associate of Arts or an Associate of Science degree and which are technically oriented (no supervisory courses). There are 38 community college programs summarized in Curriculum 1 and almost all are identical to this curriculum. This represents 48% of the colleges

responding to the questionnaires. The main differences are course titles and the arrangement of courses.

Curriculum 1

1st Semester

Typewriting
 Communication Skills 1
 Introduction to Graphic Arts
 Letterpress 1
 Machine Composition

2nd Semester

Technical Mathematics
 Communication Skills 2
 Bindery/Printing Substrates
 Letterpress 2
 Layout and Design

3rd Semester

American History
 Copy Preparation
 Offset Lithography 1
 Reproduction Photography

4th Semester

American Government
 Platemaking & Stripping
 Offset Lithography 2
 Production Planning/Practices

The second curriculum is the sum total of 27 community colleges' graphic arts programs and represents 34% of those answering the request for information. These Associate of Arts or Associate of Science degrees are oriented towards training foremen/supervisors, salesmen, and estimators.

Curriculum 2

1st Semester

Communication Skills 1
 Technical Mathematics
 Letterpress 1
 Introduction to Graphic Arts
 Human Relations

2nd Semester

Communication Skills 2
 Accounting 1
 Letterpress 2
 Layout and Design

Curriculum 2 (continued)3rd Semester

Accounting 2
 American History
 Reproduction Photography 1
 Offset Lithography 1
 Business Organization and
 Administration

4th Semester

Estimating
 Production Planning/Control
 Reproduction Photography 2
 Offset Lithography 2
 Copy Preparation/Platemaking

The third curriculum is the summation of 14 community college programs and represents 18% of the schools responding. The graduates of these programs are awarded a diploma and/or a certificate in graphic arts. This technical program is typical of programs oriented to the lithographic process. Other community college programs are letterpress oriented and a very small minority are flexography or screen process oriented, but, the majority of community colleges responding to the questionnaire were interested only in lithography.

Curriculum 31st Semester

Technical Mathematics 1
 Survey of Lithography
 Layout and Design 1
 Introduction to Offset
 Presswork
 Basic Preparatory Processes

2nd Semester

Technical Mathematics 2
 Foundation of Lithographic Science
 Layout and Design 2
 Introduction to Offset
 Pre-press
 Offset Press Operations 1

Curriculum 3

3rd Semester

Offset Preparatory Processes

Offset Press Operations 2

Technical Mathematics 3

Theory of Offset Press Operations

Reproduction Photography

Included with the three curricula sent to the personnel directors of the printing firms was a list of course descriptions of all the printing courses listed. This list was gathered from school catalogs and was included to aid the personnel directors in understanding the possibly ambiguous course titles. The presentation of the course titles and course descriptions was similar to a school catalog, both in style and as an information source. This was done to exemplify actual conditions when the main source of information on a community college program would be the school catalog. The course descriptions are included in Appendix B.

Two different research tools were used in obtaining information from the printing firms. The purpose of using two different methods was to have one verify the results of the other. A mail questionnaire was sent to approximately 400 printing firms across the country, and 12 personal interviews were conducted in New York City. The purpose of the interview was to help validate the conclusions based on the mailed responses.

In choosing the group to be interviewed, the author attempted to include 12 representative printing firms in New York City. They

included three large commercial plants, a screen process house, a small finisher, a letter service firm, three small commercial plants, a small newspaper, a quick-copy center, and a bookbinder. New York City was chosen because of its characteristics: large numbers of printing firms, close proximity to Rochester, New York, where the author was living, and the fact that the city has community colleges offering graphic arts and supplying local firms with graduates. It is not implied that New York City is representative of the United States or that the results are based on information received from them. The only purpose of the interviews was to try and validate the responses from the mail questionnaire and minimize the inherent inaccuracies of using mail questionnaires as the only source of data.

The responses of the interviews and the firms contacted by mail were correlated using Pearson's Product Moment Correlation Coefficient in the same manner as was done for the direct conclusions of the study between opinions of the community college directors and the personnel directors. If there was a significant difference between the interviews and mailings, then this factor must be pointed out in the conclusions. A difference between the findings of the two research tools would greatly reduce the value of the conclusions and would imply that the results are not measuring what they were intended to measure. Even if there was no significant difference between the interviews and the mailings, this still does not prove the responses are measuring what was intended nor that the responses are completely valid. They only support the conclusions based on the responses from the mail questionnaires.

There are thousands of printing firms in the United States and all

are part of the population examined. In this thesis, any firm which was listed under "printing" in the telephone directory was considered part of the population. Because the exact number of firms is unknown, the following statistical formula was used to calculate the number of responses needed for the results to be statistically accurate.¹⁰

$$n = 1/4 \left(\frac{t}{E^2} \right)$$

where: n represents the sample size of printing firms needed for the conclusions to be accurate,

t represents the alpha risk which for this study is 0.05, and

E represents the least significant difference between the percent of respondents choosing the same occupation for this study. E equals 10 percent.*

Using an alpha of 0.05, E = 10 percent, the number of printing firms in the sample size is 95. This number is the responses needed for accurate conclusions to be reached. Because only a 25 percent response is predicted due to the nature of mail questionnaires, 380 questionnaires were mailed.¹¹

To determine what printing firms would be included in the mailing, approximately 500 telephone books from across the country were used.** These represented all the major cities and areas in the United States.

*If there is less than a ten percent difference in the percentage of directors of community colleges choosing an occupation, the difference will not be considered significant.

**The telephone books are located at the main branch of the Rochester Public Library, 115 South Avenue, Rochester, New York.

In these books, there are approximately 768 pages of listings entitled "printers," not counting display advertisements. A table of random numbers was used to first select which page of the 768 was used; then which column of the columns 1, 2, 3, or 4; and finally, the last two digits of the random number were used to indicate which listing in the column was to be used. If there was a display advertisement chosen, it was discarded. This was done because even though a firm might have a large display advertisement, there is still a small, line listing in small type. If a random number indicated a listing physically off the page, the number was discarded and the next number was used. The purpose of this procedure was to mechanize the selection of the sample to be questioned and to eliminate any subjective feeling.

FOOTNOTES FOR CHAPTER III

¹James W. Thorton, Jr., The Community Junior College (New York: John Wiley & Sons, Inc., 1966), p. 169.

²C. William Horrell, "A Survey of Motion Picture, Still Photography and Graphic Arts Instruction," Eastman Kodak Company publication T-17, Rochester, New York, December 1971.

³Education Council of the Graphic Arts Industry, Inc., "Technical Schools, Colleges and Universities Offering Courses in Graphic Communications," 1970.

⁴James W. Reynolds, The Comprehensive Junior College Curriculum (California: McCatchan Publishing Corporation, 1969), p. 133

⁵Interview with Albert Rickmers, Professor at Rochester Institute of Technology, Rochester, New York, on April 14, 1972.

⁶Ibid., April 14, 1972.

⁷Ibid., April 14, 1972.

⁸Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1964), p. 468.

⁹Kerlinger, p. 444.

¹⁰Interview with Albert Rickmers, April 14, 1972.

¹¹Interview with Albert Rickmers, April 14, 1972.

¹²Albert D. Rickmers and H. N. Todd, Statistics (New York: McGraw-Hill Book Company, 1967), p. 8.

IV. FINDINGS AND CONCLUSIONS

The purpose of this thesis was to evaluate the validity of the occupational goals of community college graphic arts programs in the United States and the correlation of the goals to potential graduate placement. Validity relates to a student's success in obtaining a job in a position which was one of the stated occupational goals of the program. Thus, the hypothesis of the thesis was: If a community college's educational objective in a graphic arts program was to prepare the student for a specific occupational area and level of occupation in the graphic arts industry, then upon successful completion of the program, a personnel director of a graphic arts firm would hire the student for that area and level of occupation for which he was trained. The null hypothesis would read: If a community college's educational objective in a graphic arts program is to prepare the student for a specific occupational area and level of occupation in the graphic arts industry, then upon successful completion of the program, a personnel director of a graphic arts firm would not hire the student for that area and level of occupation for which he was trained. The thesis used only college course work and did not include other student experiences, such as previous education, job experiences, etc.

The response from both mailings were good in light of evidence that mailed research is problematic. After the initial mailing and two follow-up letters, there were 79 responses out of the 95 community

colleges. This was an 83 percent response. Industry responded better than expected with 117 responding, a 30 percent return.

The following three tables have been used to display the results of this thesis investigation which relates directly to acceptance or rejection of the null hypothesis. Table 1 represents the data of the responses of the community college directors and industry's personnel directors for Curriculum 1. Table 2 refers to Curriculum 2 and Table 3 shows the results in reference to Curriculum 3. Using these figures at the 0.05 level of significance, a five percent alpha risk, and performing the mathematics of the test statistics, the investigation results indicated that the responses from the community college directors and the personnel directors were not independent. The null hypothesis was rejected and the hypothesis was accepted. The coefficients of correlation were high for each curriculum: Curriculum 1, $r = 0.903$; Curriculum 2, $r = 0.888$; Curriculum 3, $r = 0.970$. These numbers mean that for each of the three curricula the occupational goals of the program as stated by the program directors were accurate according to surveyed personnel directors from graphic arts companies. This accuracy is for the complete list of occupations and not individual occupations. This is evident by comparing specific occupations, such as cameramen in Table 1. Here it is shown that 87% of community college directors selected cameramen while only 53% of the personnel directors selected cameramen. Another comparison is found in Table 2, with the platemakers, salesmen, and foremen. The use of coefficients of correlation takes the statistics and compares them as a group and not as separate entities. Individual differences here balanced each other, causing a high coefficient.

This shows that the input can be used only as a unit without generalizing that each occupation selected by the personnel directors and community college directors will have a significantly high correlation.

TABLE 1
 RESPONSES OF THE COMMUNITY COLLEGE DIRECTORS
 AND INDUSTRY PERSONNEL DIRECTORS
 FOR CURRICULUM 1

OCCUPATION	NUMBER OF COMMUNITY COLLEGE DIRECTORS SELECTING THIS OCCUPATION	PERCENT OF COMMUNITY COLLEGE DIRECTORS SELECTING THIS OCCUPATION	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION
PRESSMEN	38	100	117	100
MANAGERS	0	0	0	0
TYPESETTERS	32	84	85	73
STRIPPERS	19	50	91	78
CAMERAMEN	33	87	62	53
PLATEMAKERS	29	76	85	73
SALESMEN	5	13	7	6
ESTIMATORS	2	5	3	3
FOREMEN	3	8	0	0
BINDERY	29	76	112	96

$r = 0.903$
 $n = 38$

TABLE 2
 RESPONSES OF THE COMMUNITY COLLEGE DIRECTORS
 AND INDUSTRY PERSONNEL DIRECTORS
 FOR CURRICULUM 2

OCCUPATION	NUMBER OF COMMUNITY COLLEGE DIRECTORS SELECTING THIS OCCUPATION	PERCENT OF COMMUNITY COLLEGE DIRECTORS SELECTING THIS OCCUPATION	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION
PRESSMEN	21	78	115	98
MANAGERS	2	8	0	0
TYPESETTERS	8	30	85	73
STRIPPERS	17	63	85	73
CAMERAMEN	27	100	117	100
PLATEMAKERS	15	56	113	97
SALESMEN	19	67	15	13
ESTIMATORS	17	63	49	42
FOREMEN	19	70	17	15
BINDERY	13	48	117	100

$r = 0.888$
 $n = 27$

TABLE 3
 RESPONSES OF THE COMMUNITY COLLEGE DIRECTORS
 AND INDUSTRY PERSONNEL DIRECTORS
 FOR CURRICULUM 3

OCCUPATION	NUMBER OF COMMUNITY COLLEGE DIRECTORS SELECTING THIS OCCUPATION	PERCENT OF COMMUNITY COLLEGE DIRECTORS SELECTING THIS OCCUPATION	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION
PRESSMEN	14	100	117	100
MANAGERS	0	0	0	0
TYPESETTERS	12	86	92	79
STRIPPERS	13	93	89	73
CAMERAMEN	14	100	105	90
PLATEMAKERS	14	100	113	97
SALESMEN	0	0	0	0
ESTIMATORS	0	0	0	0
FOREMEN	0	0	0	0
BINDERY	10	71	96	82

$r = 0.970$
 $n = 14$

To help validate the data from the questionnaire to personnel directors, personal interviews of personnel directors from twelve selected printing firms in New York City were conducted. The results of the interviews were correlated with the results from the mailings in the exact manner as the correlations between the responses from the community college directors and personnel directors. Table 4 represents the data of the responses from the personnel directors from the mailed questionnaires and those interviewed for Curriculum 1; Table 5 refers to Curriculum 2; and Table 6 refers to Curriculum 3. Again using a 0.05 level of significance, a five percentage alpha risk, the results indicated the responses were not independent; that is, there were no significant differences in the responses from the mailings and interviews. For Curriculum 1, $r = 0.914$; Curriculum 2, $r = 0.985$; Curriculum 3, $r = 0.919$.

TABLE 4
 RESPONSES OF INDUSTRY PERSONNEL DIRECTORS
 MAILED QUESTIONNAIRES AND
 INDUSTRY PERSONNEL DIRECTORS PERSONALLY INTERVIEWED
 FOR CURRICULUM 1

OCCUPATION	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH MAILING	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH MAILING	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH INTERVIEWS	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH INTERVIEWS
PRESSMEN	117	100	12	100
MANAGERS	0	0	0	0
TYPESETTERS	85	73	8	67
STRIPPERS	91	78	9	75
CAMERAMEN	62	53	11	92
PLATEMAKERS	85	73	12	100
SALESMEN	7	6	0	0
ESTIMATORS	3	3	0	0
FOREMEN	0	0	0	0
BINDERY	112	96	12	100

$r = 0.914$

$n = 12$

TABLE 5
 RESPONSES OF INDUSTRY PERSONNEL DIRECTORS
 MAILED QUESTIONNAIRES AND
 INDUSTRY PERSONNEL DIRECTORS PERSONALLY INTERVIEWED
 FOR CURRICULUM 2

OCCUPATION	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH MAILING	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH MAILING	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH INTERVIEWS	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH INTERVIEWS
PRESSMEN	115	98	11	92
MANAGERS	0	0	0	0
TYPESETTERS	85	73	8	67
STRIPPERS	85	73	9	75
CAMERAMEN	117	100	12	100
PLATEMAKERS	113	97	2	17
SALESMEN	15	13	3	25
ESTIMATORS	49	42	0	0
FOREMEN	17	15	0	0
BINDERY	117	100	12	100

$r = 0.985$

$n = 12$

TABLE 6
 RESPONSES OF INDUSTRY PERSONNEL DIRECTORS
 MAILED QUESTIONNAIRES AND
 INDUSTRY PERSONNEL DIRECTORS PERSONALLY INTERVIEWED
 FOR CURRICULUM 3

OCCUPATION	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH MAILING	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH MAILING	NUMBER OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH INTERVIEWS	PERCENT OF PERSONNEL DIRECTORS SELECTING THIS OCCUPATION THROUGH INTERVIEWS
PRESSMEN	117	100	12	100
MANAGERS	0	0	0	0
TYPESETTERS	92	79	10	83
STRIPPERS	89	73	10	83
CAMERAMEN	105	90	12	100
PLATEMAKERS	113	97	12	100
SALESMEN	0	0	0	0
ESTIMATORS	0	0	0	0
FOREMEN	0	0	0	0
BINDERY	96	82	12	100

$r = 0.919$

$n = 12$

The directors of the community college programs were asked to indicate which occupational positions in the graphic arts industry have the majority of their students entered upon graduation. The results of this query were correlated with the results of the questions asking about the occupational goals of their programs. Using a level of significance of 0.05, all three coefficients of correlation indicated that the two sets of answers from the two questions were not independent, meaning that the results were not statistically dissimilar. Table 7 lists the ranked responses for each occupation from the community college directors of Curriculum 1; Table 8 are the responses from the directors of Curriculum 2; and Table 9 are the directors of programs summarized by Curriculum 3. The coefficients of correlation are lower than for the other two sets of correlation: $r = 0.879$ for Curriculum 1; $r = 0.624$ for Curriculum 2; and $r = 0.739$ for Curriculum 3. This implied that while the majority of students were, in the opinion of the community college directors, entering occupations in conjunction with stated program occupational goals, the two lists could correlate higher. This would have improved the validity of the goals.

TABLE 7
 RESPONSES OF COMMUNITY COLLEGE DIRECTORS
 OF CURRICULUM 1

The responses of community college directors to the questions: "For what graphic arts positions are you preparing students?" and "In what general occupational positions in the graphic arts industry have the majority of your students entered upon graduation?" The responses are in rank order and are for the programs summarized by Curriculum 1.

OCCUPATION	RANKING OF OCCUPATIONS FOR THE FIRST QUESTION	RANKING OF OCCUPATIONS FOR THE SECOND QUESTION
PRESSMEN	1	1
MANAGERS	10	10
TYPESETTERS	3	6
STRIPPERS	6	5
CAMERAMEN	2	2
PLATEMAKERS	4	4
SALESMEN	7	8
ESTIMATORS	9	7
FOREMEN	8	9
BINDERY	5	3

n = 0.878

n = 38

TABLE 8
 RESPONSES OF COMMUNITY COLLEGE DIRECTORS
 OF CURRICULUM 2

The responses of community college directors to the questions: "For what graphic arts positions are you preparing students?" and "In what general occupational positions in the graphic arts industry have the majority of your students entered upon graduation?" The responses are in rank order and are for the programs summarized by Curriculum 2.

OCCUPATION	RANKING OF OCCUPATIONS FOR THE FIRST QUESTION	RANKING OF OCCUPATIONS FOR THE SECOND QUESTION
PRESSMEN	2	1
MANAGERS	10	10
TYPESETTERS	9	8
STRIPPERS	5	3
CAMERAMEN	1	2
PLATEMAKERS	7	4
SALESMEN	3	9
ESTIMATORS	5	3
FOREMEN	3	6
BINDERY	8	7

$r = 0.624$
 $n = 27$

TABLE 9
 RESPONSES OF COMMUNITY COLLEGE DIRECTORS
 OF CURRICULUM 3

The responses of community college directors to the questions: "For what graphic arts positions are you preparing students?" and "In what general occupational positions in the graphic arts industry have the majority of your students entered upon graduation?" The responses are in rank order and are for the programs summarized by Curriculum 3.

OCCUPATION	RANKING OF OCCUPATIONS FOR THE FIRST QUESTION	RANKING OF OCCUPATIONS FOR THE SECOND QUESTION
PRESSMEN	1	1
MANAGERS	6	9
TYPESETTERS	5	6
STRIPPERS	4	3
CAMERAMEN	1	2
PLATEMAKERS	1	4
SALESMEN	6	10
ESTIMATORS	6	7
FOREMEN	6	8
BINDERY	6	5

$r = 0.739$
 $n = 14$

Tables 10 and 11 compare the answers to the last questions asked community college directors and personnel directors: "Do you feel that your program satisfies industry's manpower needs?" and "As a person involved with hiring printing personnel, I feel community colleges are succeeding as an important manpower source to the graphic arts industry." The consensus of 52 percent of community college directors and 44 percent of personnel directors was that they felt that community colleges are succeeding as a satisfactory source of manpower needs. Twenty-four percent of the community college directors and 35 percent of personnel directors stated that community colleges sometimes satisfied or slightly agreed with the statements as to the success of community colleges' roles as employee sources. This means that 100 percent and 91 percent of college directors and printing personnel directors respectively had positive feelings toward community colleges and their graduates.

TABLE 10
RESPONSES OF COMMUNITY COLLEGE DIRECTORS

The responses of community college directors to the question: "Do you feel that your program satisfies industry's manpower needs?"

Highly satisfies	14%	
Satisfies	52%	
Sometimes satisfies	24%	n = 95
Rarely satisfies	0%	
Does not satisfy at all	0%	

TABLE 11
RESPONSES OF INDUSTRY PERSONNEL DIRECTORS

The responses of industry personnel directors to the question: "As a person involved with hiring printing personnel, I feel that community colleges are succeeding as an important manpower source to the graphic arts industry."

Strongly agree	12%	
Agree	44%	
Slightly agree	35%	n = 115
Disagree	9%	
Strongly disagree	0%	

The conclusion of this research was contrary to much of the literature concerning community colleges' graphic arts programs. The study concluded that the goals set forth for a program were valid. That is, students were being hired for those positions for which the course was designed. This does not mean that every student in every community college's graphic arts program would be hired for a certain job, but in general terms, the majority of students have obtained jobs in those areas for which the programs were designed. This is a very general statement based on the correlation of two lists. Significant differences in responses to specific occupations in the lists make specific evaluations of a job suspect to statistical validity. The conclusion therefore is based solely on the response lists as a unit.

V. RECOMMENDATIONS

The results of this thesis are a generalized statement on the validity of occupational goals of community college graphic arts programs in the United States. Each community college should conduct its own investigation for its own area. The method can be copied and local industry would then be queried. The results would directly aid the schools with its self-evaluation and they might better understand industry's perception of the community college as a manpower source. Because most community colleges deal with a geographically small area compared to the scope of this research, more personal interviews are suggested. This will increase the validity of the results and also further acquaint the community college personnel with local industry and its needs.

The need for closer ties between educators and industry is illustrated by the wide variances in the data. While the correlations were high, significant differences for specific occupational categories are evident and personal interviews and re-interviews will locate differences of opinions and guide the colleges to preparing students for employment.

If this thesis was repeated in its entirety or on a small scale for a specific college, certain things could be changed to improve the results and alleviate certain problems. If done on a smaller scale or if financially possible, personal interviews would be much better. The percent response would be higher and, therefore, the responses more

reliable. In a specific, smaller area, personal industrial interviews with the higher number of responses could statistically reduce the number to one manageable for a single researcher. For nationwide surveys, a way to increase the number of personal interviews of college directors would be at conventions such as the annual International Graphic Arts Education Association convention or the American Vocational Association convention.

One important area overlooked in both the mail questionnaires and personal interviews was the further education of community college graduates. The thesis treated the community college program as terminal, with no continuation of students into three- and four-year programs. Any further research should include these students and their needs.

A major problem of this thesis was the physical handling and preparation of letters and questionnaires. Preparation, duplication and addressing took much time and effort. Research on a smaller scale where fewer mailings are necessary and more interviews are used would help eliminate most of this task.

The results of this thesis are contrary to industrial reports and graphic arts literature as to the accuracy of community college occupational goals. A report of this research or different types of research should be implemented to aid in the judgment of community colleges and their goals. One long-range project could involve the tracing of a random number of community college graduates into jobs and continue the process for two or three years to see the progress of the graduate and chart his job placement, advancement and progress. This could be very interesting, especially in correlating the graduates with people

entering the graphic arts industry that do not have the benefit of a community college education.

APPENDICES

APPENDIX A

SAMPLE OF LETTER AND QUESTIONNAIRE
MAILED TO COMMUNITY COLLEGE DIRECTORS

294 Crittenden Way, Apt. 2
Rochester, New York 14623
April 1972

Director of Graphic Arts
Community College
100 Main Street
City, State Zip

Dear Sir:

As a graduate printing education student in the master of science program at Rochester Institute of Technology, Rochester, New York, I am presently involved with an education thesis for which I need your assistance. The project's main purpose is to understand the printing industry's manpower needs in relation to community college occupational goals. To accomplish this, I need information from the director of the graphic arts program at every community college that presently teaches graphic arts in the country. In this position, you are best able to answer the enclosed questions. A copy of the school catalog is also requested from you as it is a very important part of my research.

No school's name will be used in the report and the data will be kept in the strictest confidence, so please answer the questions as accurately as possible so that the results will truly reflect conditions across the country in community college graphic arts education programs.

Please return the questionnaire as soon as it is completed as time is a factor. I am sorry that no return envelope is included but schools have many different sizes of catalogs and no one size would be practical. Thank you very much for your time and consideration.

Yours truly,

Howard Rose

APPENDIX A (continued)

1. For what graphic arts positions are you preparing students? (Check one or more of the following.)

pressmen strippers platemakers estimators
 cameramen managers typesetters bindery
 salesmen foremen/supervisors

Others (list) _____

2. In what general occupational positions in the graphic arts industry have the majority of your students entered upon graduation? Please place numbers before each item to arrange them in order of relative number of students in each area. (1) is the area with the most students; (2) is next; (3) is next; etc.

pressmen strippers platemakers estimators
 cameramen managers typesetters bindery
 salesmen foremen/supervisors

Others (list) _____

3. Do you feel that your program satisfies industry's manpower needs? (Check one.)

highly satisfies
 satisfies
 sometimes satisfies
 rarely satisfies
 does not satisfy at all

Please remember to enclose your course catalog. Thank you. Howard Rose

APPENDIX B

SAMPLE OF LETTER AND QUESTIONNAIRE
MAILED TO INDUSTRY PERSONNEL DIRECTORS

294 Crittenden Way, Apt. 2
Rochester, New York 14623
July 5, 1972

Personnel Director
Haertlein Graphics Inc.
7600 West Hampton Avenue
Milwaukee, Wisconsin 53218

Dear Sir:

As a graduate printing education student in the master of science program at Rochester Institute of Technology, Rochester, New York, I am presently involved with an educational thesis for which I need your assistance. The project's main purposes are to understand the printing industry's manpower needs in relation to community college graduates, to find out the opinions of community college graphic arts programs, and to see if community colleges are satisfying industry's needs. To accomplish this, I need information from the personnel directors of printing companies across the country. In this position, I believe you are best able to answer the enclosed questions.

No company's name will be used in this thesis and specific data relating to individual companies will be kept in the strictest confidence, so please answer the questions accurately so that the results will truly reflect industrial conditions. Please return the questionnaire in the enclosed envelope as soon as it is completed as time is a factor and so that I will not need to send follow-up inquiries.

Thank you very much for your time and consideration.

Yours truly,

Howard Rose

APPENDIX B (continued)

Instructions: Please examine the following curricula. They represent typical community college programs awarding an Associate of Arts, an Associate of Science, or a diploma/certificate degree in graphic arts. After examining each curriculum, please check those occupational positions you feel a graduate of such a program would be qualified to fill. The course descriptions of the graphic arts courses are included to clear up any misunderstandings concerning the course titles.

Question: As a person involved with hiring printing personnel, I feel community colleges are succeeding as an important manpower source to the graphic arts industry. Check one.

_____ strongly agree _____ agree _____ slightly agree
 _____ disagree _____ strongly disagree

Curriculum 11st Semester

Typewriting
 Communication Skills 1
 Introduction to Graphic Arts
 Letterpress 1
 Machine Composition

2nd Semester

Technical Mathematics
 Communication Skills 2
 Bindery/Printing Substrates
 Letterpress 2
 Layout and Design

3rd Semester

American History
 Copy Preparation
 Reproduction Photography
 Offset Lithography 1

4th Semester

American Government
 Advanced Platemaking and Stripping
 Production Planning/Practices
 Offset Lithography 2

_____ pressmen _____ strippers _____ platemakers _____ estimators

_____ cameramen _____ managers _____ typesetters _____ bindery

_____ salesmen _____ foremen/supervisory

Others (list) _____

APPENDIX B (continued)

Curriculum 21st Semester

Communication Skills 1
 Technical Mathematics
 Letterpress 1
 Introduction to Graphic Arts
 Human Relations

2nd Semester

Communication Skills 2
 Accounting 1
 Letterpress 2
 Layout and Design

3rd Semester

Accounting 2
 American History
 Reproduction Photography 1
 Offset Lithography 1
 Business Organization and
 Administration

4th Semester

Estimating
 Production Planning/Control
 Reproduction Photography 2
 Offset Lithography 2
 Copy Preparation/Platemaking

_____ pressmen _____ strippers _____ platemakers _____ estimators

_____ cameramen _____ managers _____ typesetters _____ bindery

_____ salesmen _____ foremen/supervisory

Others (list) _____

Curriculum 31st Semester

Technical Mathematics 1
 Survey of Lithography
 Layout and Design 1
 Introduction to Offset
 Presswork
 Basic Preparatory Processes

2nd Semester

Technical Mathematics 2
 Foundation of Lithographic Science
 Layout and Design 2
 Introduction to Offset
 Pre-press
 Offset Press Operations 1

3rd Semester

Offset Preparatory Processes
 Offset Press Operations 2
 Technical Mathematics 3
 Theory of Offset Press Operations
 Reproduction Photography

APPENDIX B (continued)

Curriculum 3 (continued)

_____ pressmen _____ strippers _____ platemakers _____ estimators
 _____ cameramen _____ managers _____ typesetters _____ bindery
 _____ salesmen _____ foremen/supervisory

Others (list) _____

COURSE DESCRIPTIONS (graphic arts course work only)

Letterpress 1 --- This course includes hand, machine, and photomechanical composition, makeup, reproduction proofs, and hand-fed and automatic platen press operations. Three lecture hours and nine laboratory hours each week.

Letterpress 2 --- The student continues developing skill in the use of foundry type, linecasting machines, photomechanical machines, makeup, reproduction proofs, and hand-fed and platen press operations. Imposition and cylinder press operations are introduced. Three lecture hours and nine laboratory hours each week.

Machine Composition --- A course of study in mechanical typesetting systems: hot metal and cold type. Three lecture hours and six laboratory hours each week.

Introduction to Graphic Arts --- This course includes discussion of various printing processes and their characteristics, safety measures, new techniques and developments, and ethics of the trade. Two class hours each week.

Bindery/Printing Substrates --- The student will study and demonstrate the skills required for collating, stitching, padding, bookbinding, diecutting, folding, packing, and distributing. Also included are the basics of papermaking and the characteristics of paper and other substrates as a printing receiver. Three lecture hours and six laboratory hours each week.

Layout and Design --- This course will involve type design, the terms relating to type composing and printing, and its relationship to usage in books, magazines, newspapers, and advertisements. The student will learn basic designs based on different printing techniques and type styles. Two lecture hours and three laboratory hours each week.

APPENDIX B (continued)

- Copy Preparation --- The student will study ruled forms, paste-up, proofreading, and the preparation of mechanicals. He will develop skill in these areas by actual involvement in laboratories. Three lecture hours and six laboratory hours each week.
- Reproduction Photography 1 --- A course in basic camera and production, including art work, keyline, black and white line work, and dark-room techniques. Three lecture hours and six laboratory hours each week.
- Reproduction Photography 2 --- Advanced camera work is covered, including halftones, duotones, silhouette, screens, color separation, multiple page layout, and stripping. Three lecture hours and six laboratory hours each week.
- Offset Lithography 1 --- The student develops skills in stripping, rudimentary platemaking, and press operation on duplicators and small presses. Three lecture hours and nine laboratory hours each week.
- Offset Lithography 2 --- The student will work on larger presses and discuss press design, fountain solution and ink, new developments and web presses. Three lecture hours and nine laboratory hours each week.
- Platemaking and Stripping --- The student will develop job entry skills in stripping and platemaking, photocomposing, stripping techniques, a working knowledge of various types of layouts, the use of screen tints, register techniques, and the stripping of multiple forms. In platemaking, the student will demonstrate negative positioning and platemaking, the making of multiple exposure plates, close register plates, adding and deleting work on the plate, exposing, and processing, and general platemaking problems and solutions. Three lecture hours and six laboratory hours each week.
- Production Planning/Practices --- This course is designed to correlate the laboratory experiences gained in the areas of composition, presswork, and bindery. Emphasis will be on newspaper and job production practices. Three lecture hours each week.
- Estimating --- Emphasis is placed on the fundamentals and background necessary to analyze all operations needed to produce a printed job. The student becomes familiar with the different techniques used to accomplish an estimating objective and with different estimating functions employed in the graphic arts field. Three lecture hours each week.
- Copy Preparation/Platemaking --- The student will develop skills in copy preparation, stripping, and platemaking for offset lithography. Three lecture hours and three laboratory hours each week.

APPENDIX B (continued)

Production Planning/Control --- This course is designed to correlate the laboratory experiences gained in the areas of composition, presswork and bindery. Emphasis will be on job production and supervisory practices. Three lecture hours each week.

Introduction to Offset Pre-Press --- Lithographic apprentices are oriented to the job responsibilities of the journeyman cameraman, stripper, and platemaker. Each apprentice has the opportunity to try some of the processes involved in camera work, stripping, and platemaking. Three lecture hours and four laboratory hours each week.

Offset Press Operations 1 --- A practical course in the fundamental operations of the offset press. All parts of the press are studied in relationship to their operating characteristics, function, care, and maintenance. Causes of printing press failures and their prevention are covered. Three lecture hours and six laboratory hours each week.

Offset Press Operations 2 --- An advanced practical course in comparative operation of the offset press. Various presses are studied with respect to their operating characteristics, function, care, and maintenance. Color printing is also covered. Three lecture hours and four laboratory hours each week.

Foundation of Lithographic Science --- The application of the sciences to the lithographic trades is covered. Specifically, scientific methods of measurement are developed, along with factors in quality control and instrumentation, and the understanding and use of chemical shorthand. Three lecture hours each week.

Offset Preparatory Processes --- The advanced techniques, processes, and systems used in the preparation of images for offset lithography are practiced. Production procedures for controlling the preparatory processes are introduced. Three lecture hours and three laboratory hours each week.

Theory of Offset Press Operation --- A study is made of fundamental principles of offset press operation. The various parts of the press are identified and studied in relationship to their characteristics, functions, care, and operating principles. Much time is devoted to the causes of printing press failures and their prevention. Safety in the operation of presses is also stressed. Three lecture hours each week.

Survey of Lithography --- A required course for apprentices in lithography so that they can better understand how their particular function relates to other craft areas. Copy preparation, image

APPENDIX B (continued)

conversion, and printing image carriers are compared among the different printing processes, with emphasis on how each relates to offset lithography. Three lecture hours each week.

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