

A Survey of Texas Printers: Lessons for Graphics Educators

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During the summer and fall of 1995, a survey was distributed to printers throughout the state of Texas. For the first time, both the Printing Industries Association of Texas and the Printing Industries of the Gulf Coast agreed to allow the combined membership of both associations to be surveyed with the same instrument designed by Waite and Russell (1995). The survey consisted of three separate sections. 1) A demographics section included questions relating to the characteristics of the industry's employees as well as questions related to the fringe benefits offered by employers. 2) A wage and salary section provided a list of 188 job titles and asked the respondent to provide the exact wage or salary for each employee in each category. 3) A technology-use section asked questions related to the respondent's use of on-line services, telecommunications capabilities, and hardware and software use.

Approximately 18 percent, or a total of 278, of the 1,600 distributed surveys were completed and returned by respondents. Responses were entered into a database and descriptive statistics were calculated. The statistics were compiled into two reports: the *1996 Texas Printers' Wage and Benefit Survey* (Printing Industries of the Gulf Coast, 1996), and the *Texas Printers' Technology Use Survey* (Waite, 1996).

Graphics educators may find some of the discoveries of the survey to be surprising, and may wish to use the findings to prepare curriculums that will better prepare students for the workforce. Even though the survey was limited to Texas, the findings should generalize to major cities in other states because of the 18 percent response rate coupled with a high percentage of responses from printers in major metropolitan areas (Houston, Dallas-Fort Worth, Austin, and San Antonio printers accounted for 85% of the responses).

Demographic Information

The demographic information section included 21 questions regarding features of the respondent's firm and benefits accruing to the firm's employees. Many of the questions, such as business location and leave of absence, holiday, vacation, and benefits policies, are of little interest to educators. However, the responses to several of the questions may be useful in making curriculum decisions. The responses to selected questions are discussed below.

Number of employees by classification

Respondents were asked to indicate the number of employees in each of 21 different categories. The categories included: management, office, office products, technical, photography, electronic prepress, typesetting and makeup, prepress production, on-demand printing, general helper, small sheetfed offset press operation, large sheetfed offset press operation, commercial heat-set web press operation, non heat-set web press operation, forms press and collator operation, flexography/letterpress operation, screen printing operation, other press operation, bindery/finishing operation, general/warehouse/delivery, janitorial/maintenance, and other (write-in).

The total number of respondents who indicated that their firms employ individuals in each of the categories and the median number of employees per category were calculated. The total number of employees in a given category was determined by summing the total number of reported wages for each category (see the *Wage and Salary Information* section below). Table 1 provides information about those categories that represent at least 300 employees. The first column lists the category, while the second column provides the number of respondents who indicated that their firms employ individuals in the category. Column three provides the median number of categorized employees per firm. The final column is the total number of employees of the respondents' companies whose jobs are in a given category. For example, in row one it can be seen that 269 respondents indicated that their firms have employees in the listed categories, that the median number of employees per firm is 13.21, and the overall number of employees covered by the survey is 7,233. The categories listed in the table comprise 5,272 employees, or 73% of the total number of employees covered by the survey.

| Job category | Number of respondents | Median employees in category | Total employees in category |
|--|-----------------------|------------------------------|-----------------------------|
| Total employees | 269 | 13.21 | 7,233 |
| Bindery/finishing operations | 169 | 3.18 | 1,309 |
| Management | 256 | 2.38 | 1,301 |
| Press operations (sheetfed offset) | 103 | 3.04 | 1,060 |
| Prepress production | 125 | 2.21 | 718 |
| Electronic prepress | 97 | 2.42 | 547 |
| Office | 207 | 1.82 | 443 |
| Press operations (small sheetfed offset) | 164 | 1.73 | 337 |

Table 1: Number of employees by category, ranked by number of employees

Several observations pertinent to graphics educators can be drawn from Table 1. First, it is obvious that the printing industry remains a small-plant operation. In graphics courses, students should be taught that they will most likely work for small firms and that they will need to be knowledgeable and flexible so that they may perform varying tasks. In addition, those students interested in entrepreneurial activities should be encouraged to consider printing because of the small-business character of the industry.

Another interesting observation is the order of the categories. The industry has more employees in binding and finishing than in any other category. In addition, it is apparent that there are more press operators than prepress personnel.

In a curious aside, Hansen (1995) surveyed Texas Industrial Technology teachers during the same time period as this study. He asked the teachers to rank the importance of 27 communication technology topics using a five-point Likert scale. He then rank-ordered the average responses from high to low. The operation of the lithographic offset press ranked

number 27, while binding and finishing ranked 26. Interestingly, topics related to prepress—utilizing graphic-related software, process photography, and art and copy preparation—ranked 5, 14, and 15, respectively. It is obvious that the teachers’ views regarding the importance of printing-related topics deviates from the industry’s actual employee base.

Educators should tell their students the actual number of employees in various printing job categories in their geographic areas. In addition, curriculum decisions should be influenced by actual employment in job categories. It is imperative that students in graphics classes learn about finishing, binding, and presswork, as well as prepress. In addition, students should learn skills that will be beneficial in printing plant offices as well. Unfortunately, many graphics programs and teachers, as evidenced by Hansen’s data, minimize skills that are of great importance to the printing industry.

Drug-use policies

Texas printing firms are adopting policies regulating the use of drugs, alcohol, and tobacco in the workplace and those policies are stricter than ever before. More than half of the respondents indicated that their firms have a drug-free workplace policy. Although no previous state-wide data regarding drug-use policies is available, a 1993 study (Printing Industries of the Gulf Coast, 1994) of printers in the Gulf-Coast region of Texas is available for comparison. The 1995 respondents answered most drug-related questions more stringently than the 1993 respondents. The results of the present study, as well as those found in the regional 1993 study, are shown in Table 2.

| Survey Question | 1995 percent responding affirmative (statewide) | 1993 percent responding affirmative (regional) |
|--|---|--|
| Company has a written drug-free workplace policy | 52.88% | 39.50% |
| Policy provides termination for possession or intoxication | 51.44% | 38.20% |
| Company drug-tests new employees | 25.90% | 23.70% |
| Company drug-tests in the event of an accident | 21.58% | 17.10% |
| Company drug-tests at random | 11.15% | 15.80% |
| Company drug-tests for cause | 17.27% | 17.10% |
| Company does <i>not</i> test for drugs or alcohol | 31.65% | 30.30% |
| Company has a no smoking policy | 43.88% | na |
| Company allows smoking outside the building only | 37.77% | na |

Table 2: Drug-use policies among Texas printers

Students in graphics courses should be taught that the policy of more than half of the surveyed printers is to terminate employees who possess or use alcohol or drugs in the workplace. Furthermore, nearly 70% of the respondents test their employees for drug or alcohol use. In addition, nearly half of the respondents’ firms prohibit smoking and about one third allow

smoking only outside the building. Clearly, printing firms are interested in limiting their employees' use of drugs at work.

Preemployment testing

Some Texas printers are beginning to utilize preemployment testing during the screening of new applicants. Some firms test for aptitude, while others test for color deficiency and other physical attributes. Teachers should find out what, if any, preemployment exams are given by printers in their geographic area and help prepare students to take those tests. The percent of respondents whose firms employ various types of preemployment testing are shown in Table 3.

| Survey Question | Percent responding yes |
|--|------------------------|
| Company uses a preemployment aptitude test | 10.43% |
| Company uses a preemployment color deficiency test | 5.04% |
| Company uses a preemployment hearing test | 6.47% |
| Company uses a preemployment physical test | 11.87% |
| Company uses a preemployment psychological test | 1.80% |

Table 3: Preemployment tests used by Texas printers

Jobs that are expected to be filled within the next year

Texas printers expect to hire new people soon. Respondents were asked to indicate the categories of employees that they will need to hire within the coming year. The five categories in most demand, determined by the percent of respondents who plan to hire people in each category, are shown in Table 4. Only those categories that were selected by at least ten percent of the respondents are shown in the table.

| Job category | Total responses | Percent responding affirmatively |
|---|-----------------|----------------------------------|
| Electronic prepress | 49 | 17.63% |
| Bindery/finishing operations | 43 | 15.47% |
| Office | 42 | 15.11% |
| Press operations: (small sheetfed offset) | 39 | 14.03% |
| Press operations (sheetfed offset) | 31 | 11.15% |

Table 4: Jobs Texas printers expect to fill in the coming year, ranked by percent response

It is not surprising that, in an era of increasingly computerized processes, people in the electronic prepress category are in high demand. Educators can prepare students for important jobs in the specific job titles that comprise the electronic prepress category, including: preflight coordinator, computer systems manager, color scanner operator, scanner scaling/mounting technician, color electronic prepress electronic color corrector, color electronic prepress page make-up operator, desktop publishing operators, and desktop publishing preflight technicians.

Perhaps a bit surprising is the high demand for bindery/finishing workers. This demand could be caused by a relatively high turnover rate among employees in this category, or by a projected increase in production coupled with a lack of automation in bindery jobs. Students who learn to operate binding and finishing equipment, such as a cutter, folder, gluer, stitcher-binder, perfect binder, bookbinder, and so on, will be in great demand.

In addition, printers will continue to need press operators for both small and large sheetfed machines as well as office personnel, including secretaries, receptionists, data entry clerks, billing clerks, and buyers.

When reading Table 4, it is easy to conclude that graphics educators should emphasize the preparation of electronic prepress personnel. However, it is important to note that even though a greater number of respondents reported that they need prepress operators more than any other category of workers, the same respondents indicate that they currently employ more bindery and press personnel than prepress technicians. If printers add new employees to various categories in proportion to the current employee base, far more bindery/finishing workers will be needed than prepress workers. Table 5 illustrates the potential new employees in the high demand categories that the respondents' firms will need during the next year. The table illustrates that, in absolute numbers, the respondents need more bindery and press personnel than employees in the office or in prepress.

| Job category | Total current employees (from Table 1) | Percent of firms that need additional employees in this category (from Table 4) | Potential employment need (column 2 × column 3) |
|---|--|---|---|
| Bindery/finishing operations | 1,309 | 15.47% | 203 |
| Press operations (sheetfed offset) | 1,060 | 11.15% | 118 |
| Electronic prepress | 547 | 17.63% | 96 |
| Office | 443 | 15.11% | 67 |
| Press operations: (small sheetfed offset) | 337 | 14.03% | 47 |

Table 5: The potential employment needs of responding printers, ranked by demand

Table 5 does not illustrate the total number of employees needed by the printing industry in the state of Texas. Rather, it illustrates the potential need of the survey respondents. It is important, however, to note the order of the categories. Even though the respondents indicated a greater

relative need for prepress workers than other workers, the absolute need for bindery and large sheet-fed press operators is greater than the need for prepress technicians.

Sources of employees

Sadly, the printing industry does not look at schools as sources for employment candidates. Table 6 illustrates that printers tend to look for their employees through traditional word-of-mouth among employees and through want-ads.

| Question | Percent responding |
|--------------------------|--------------------|
| Friends and employees | 64.75% |
| Newspaper want ads | 64.03% |
| Trade Association lists | 39.21% |
| People who drop in | 29.14% |
| Employment agencies | 20.86% |
| Educational Institutions | 13.67% |

Table 6: Sources for printing industry employees

Wage and Salary Information

The wage and salary section of the survey included 188 managerial and non-management job titles grouped under the 21 categories. Respondents were asked to provide the actual monthly salary or hourly wage for *each* of the firm’s employees in *each* applicable title. In addition, respondents were allowed to write-in one or more job titles and provide wages for their employees that would be included in that title. A total of 7,233 wages were submitted for 174 of the survey’s job titles, while no wages were reported for 14 titles. Eighteen write-in job titles were provided by the respondents.

All wage and salary figures were entered into a database. The number of wages in each category, along with the lowest, median, and highest reported pay rates were determined. Table 7 provides the ten managerial job titles with the highest median monthly salary while Table 8 provides the twenty non-management titles that enjoy the highest median hourly wages.

Of the twenty top-paying non-management job titles, nine are related to press operation. Five titles are associated with prepress operations, while three are related to computer programming. Screen printing, bindery, and maintenance job titles complete the list. It is clear that the printing industry values—and pays—its employees who have press-related titles more than many employees who complete other tasks.

When planning curriculums, it is important for graphics educators to stress those skills and knowledges that will prepare their students for high paying job titles. Although prepress and other computer-related skills may seem glamorous at the present time, instruction in press operation must not be neglected.

| Job Title | Number | Lowest | Median | Highest |
|-----------|--------|--------|--------|---------|
|-----------|--------|--------|--------|---------|

| | of salaries reported | reported salary | salary | reported salary |
|------------------------------|----------------------|-----------------|------------|-----------------|
| Sales manager | 37 | \$1,250.00 | \$4,393.61 | \$8,944.01 |
| General manager | 158 | \$940.00 | \$4,358.97 | \$40,000.00 |
| Plant manager | 73 | \$1,473.33 | \$4,287.79 | \$10,417.00 |
| Controller/financial officer | 60 | \$1,343.50 | \$4,177.96 | \$10,833.00 |
| Combination top management | 66 | \$866.00 | \$3,693.90 | \$31,564.95 |
| Inside sales | 51 | \$1,000.00 | \$3,440.12 | \$22,508.60 |
| Production manager | 112 | \$1,480.00 | \$3,429.09 | \$7,248.80 |
| Human resources manager | 25 | \$1,343.50 | \$3,356.90 | \$5,752.41 |
| Assistant plant manager | 12 | \$2,000.00 | \$3,344.22 | \$5,633.00 |
| Chief estimator | 37 | \$1,365.38 | \$3,296.59 | \$9,333.00 |

Table 7: The highest paying printing management job titles, ranked by median salary.

| Job Title | Number of wages reported | Lowest reported wage | Median wage | Highest reported wage |
|--|--------------------------|----------------------|-------------|-----------------------|
| Pressroom supervisor | 11 | \$21.64 | \$24.07 | \$29.81 |
| Commercial heat-set web working supervisor | 4 | \$20.69 | \$21.98 | \$23.50 |
| Commercial non heat-set web working supervisor | 13 | \$12.05 | \$21.57 | \$24.30 |
| Computer systems manager | 32 | \$12.50 | \$21.07 | \$37.14 |
| Prepress supervisor | 43 | \$10.39 | \$20.78 | \$30.00 |
| Maintenance manager | 7 | \$17.55 | \$19.79 | \$25.30 |
| 38" and larger six color first pressman | 44 | \$14.20 | \$19.74 | \$23.15 |
| Systems manager (programming-telecommunications) | 21 | \$11.00 | \$19.67 | \$33.64 |
| Pressroom supervisor–sheetfed offset | 24 | \$11.00 | \$19.54 | \$35.24 |
| CEPS electronic page make-up operator | 71 | \$10.50 | \$18.81 | \$26.10 |
| Systems programmer | 8 | \$14.42 | \$18.51 | \$25.95 |
| Lead press operator–commercial heat-set web | 54 | \$12.00 | \$18.38 | \$23.81 |
| Production manager–bindery | 30 | \$7.00 | \$18.00 | \$27.88 |
| Working supervisor-color prepress | 34 | \$10.50 | \$17.67 | \$23.08 |
| 38" and larger four color first press operator | 42 | \$10.25 | \$17.66 | \$22.48 |
| Working supervisor-R&W prepress | 14 | \$12.11 | \$17.50 | \$21.30 |
| 38" and larger five color first press operator | 17 | \$12.50 | \$17.46 | \$21.00 |
| CEPS electronic color corrector | 13 | \$9.50 | \$17.44 | \$26.27 |
| Working supervisor–screen printing | 3 | \$16.11 | \$17.37 | \$18.00 |
| 26"/28" six color press operator | 14 | \$13.39 | \$16.78 | \$20.00 |

Table 8: The highest paying printing non-management job titles, ranked by median wage

Technology-Use Information

The technology-use section asked nine questions related to the respondent's use of fax machines, on-line services, telecommunications, hardware, and software. The respondents indicate that some companies are up-to-date in the use of some technologies. However, many firms are sadly behind in the use of relatively ubiquitous technologies. Graphics teachers may be able to positively influence the future of the industry by teaching their students about applicable technologies so that they, in turn, will be able to implement those technologies in printing businesses.

Telecommunications capabilities

Unsurprisingly, 92% of the respondents have a fax machine. However, only 18% have FAX to computer capability. It appears that many printers are unaware of the relatively simple technology that allows a computer to "read" a fax into a file that can be edited and reformatted.

Twenty-eight percent of the respondents indicate that they can receive jobs modem-to-modem, but most the respondents indicate that their firms do *not* have access to the on-line services (see Table 9). Of those who do have access to on-line services, the service of choice is America On-Line. Only 9% of the respondents are receiving any jobs by on-line services.

If graphics educators ensure that their students learn how to use on-line services, those students will be able to help printers take advantage of the advertising potential of the Internet as well as the simplified file transmittal procedures (digital transmission eliminates courier services and other "sneaker-net" activities) that the net can provide.

| On-line service | Responses | Percent responding |
|------------------------|------------------|---------------------------|
| America On-Line | 59 | 21.22% |
| CompuServe | 31 | 11.15% |
| Prodigy | 15 | 5.40% |
| HAL-PC | 7 | 2.52% |
| Other E-Mail | 27 | 9.71% |

Table 9: Respondents' access to on-line services

Computer Hardware

Printers use different computer platforms for different functions. Most printing companies (86%) are using computers for office productivity. It is interesting, however, that only about two-thirds of the respondents are using computers in production. The IBM PC compatible is definitely the platform of choice for office use, while the Macintosh enjoys a *slight* edge over the PC in production. It is important to note that the survey asked whether or not a platform is being used in a plant, not the *quantity* of each type of machine in use. Nor did the survey ask the respondents for their *preferred* platform. It may be that many printing plants have several machines of one platform and just one or two of another. The data are summarized in Table 10.

| Computer used | Office | Production |
|----------------------------------|--------|------------|
| Percent of firms using computers | 85.97% | 64.75% |
| IBM PC compatible | 74.82% | 36.69% |
| Macintosh | 16.91% | 44.96% |
| Apple II | 2.88% | 7.91% |
| Mini or mainframe computer | 6.47% | 5.40% |

Table 10: Use of computer platforms by respondents

For many graphics teachers, the slight edge of the Macintosh over the PC may come as a bit of a shock. However, many large firms are doing their own desktop publishing in-house, using their own PC computers, and then transmitting the resultant files to printers for output (D. Piercy, personal communication, November 14, 1995). Coupled with the almost seamless interchange of files between Windows and Macintosh versions of popular graphics software, it seems obvious that printers are adopting whatever technology is necessary to serve their clients. As a result of the clear choice of the PC platform for use in printing company offices and the almost equal availability of PCs and Macintoshes in print production, graphics teachers must make every effort to ensure that their students become proficient using *both* platforms.

Computer Software

The final section of the survey was related to computer software used by the respondents in the office and in production. Table 11 summarizes the findings. In the office, WordPerfect, Microsoft Word, Lotus 1-2-3, and d-Base are the most widely used.

In production, PageMaker, Photoshop, QuarkXPress, Illustrator, Freehand, and Microsoft Word are predominant. The survey did not ask respondents to list their *preferred* software packages—only the ones *that are used* in the business.

To help prepare students for careers in graphics, teachers need to incorporate instruction about as many popular production- and office-related software packages as possible.

| Program | Office | Production |
|----------------|--------|------------|
| Arts & Letters | 1.80% | 5.76% |
| CorelDraw | | 1.80% |
| dBase | 12.23% | 2.88% |
| Excel | 2.88% | 1.08% |
| FoxPro | 8.63% | 5.40% |

| | | |
|-------------------------------------|---------------|-------------------|
| FrameMaker | 0.36% | 5.40% |
| Freehand | 2.52% | 27.70% |
| Illustrator | 2.52% | 34.89% |
| Lotus | 24.46% | 5.76% |
| MS Word | 25.54% | 21.58% |
| Program (continued) | Office | Production |
| OCR (Optical Character Recognition) | 5.04% | 16.55% |
| PageMaker | 10.43% | 52.88% |
| PeachTree | 3.96% | |
| Photoshop | 3.60% | 42.45% |
| Q & A | 3.24% | 2.16% |
| QuarkXPress | 4.68% | 41.37% |
| Ventura / Corel Ventura Publisher | 2.88% | 16.91% |
| Word Perfect | 31.29% | 18.71% |
| Wordstar | 2.16% | 1.08% |

Table 11: Software used by printers, ranked alphabetically

Surprisingly, nearly 40% of the respondents indicated that their firms *do not* use computer estimating software (see Table 12). The table provides the percent of the respondents who use each of several available “off-the-shelf” estimating programs. The programs listed are generally used for small printers—unfortunately, the large-plant estimating packages, such as Covalent and Heidelberg, were not listed on the survey form. In addition, Table 12 indicates that the most popular estimating programs are those written in house.

Graphics educators have an opportunity to positively influence the profitability of printing businesses by teaching and stressing the use of computer estimating software in their curriculums. Because of the prevalence of in-house estimating programs (many of which are likely spreadsheet templates), graphics educators should also provide for an opportunity for this students to learn programs such as Excel or Lotus 1-2-3.

| Estimating program | Percent responding |
|--|--------------------|
| Company does not use estimating software | 39.93% |
| Custom: written in-house | 15.83% |
| Franklin | 2.52% |
| Printers Plan | 2.52% |
| PrintSmith | 2.16% |
| Hagen | 1.80% |
| Printers Plus | 1.44% |

| | |
|----------------------|-------|
| PrintLeader | 1.44% |
| Programmed Solutions | 1.44% |

Table 12: Respondents' use of estimating software, ranked by popularity

Summary

The 1995 statewide survey of Texas printers offers seven valuable lessons for graphics educators. 1) The printing industry is a small-business industry. Graphics educators should encourage their students who have an entrepreneurial disposition to consider aspiring to become a printing company owner. 2) The printing industry employs more press operators and bindery workers than employees in any other non-managerial category. In addition, presswork and binding/finishing jobs are in higher demand than prepress or office positions. Furthermore, several presswork job titles are among the highest paying in the industry. Accordingly, graphics curriculums must not minimize instruction in presswork and bindery. 3) Printing businesses are becoming less tolerant of drug, alcohol, and tobacco use on the job. Students should be informed of this phenomenon. 4) Most printing companies are sadly behind in the adoption of telecommunications capabilities. This provides an excellent opportunity for graphics educators to positively influence the future of the industry by teaching students how to use on-line services and other telecommunications technologies. 5) The PC computer is the platform of choice in printing company offices. In addition, almost as many firms use PCs as Macintoshes in production. Consequently, graphics students must become proficient using both platforms. 6) The most popular computer software packages used in printing plants are WordPerfect, Microsoft Word, Lotus 1-2-3, d-Base, PageMaker, Photoshop, QuarkXPress, Illustrator, and Freehand. Therefore, graphics students should learn as many of these programs as possible. 7) Nearly 40% of printers are not using computer-based estimating systems. Graphics teachers can positively influence this phenomenon by including spreadsheet and computer estimating instruction in their curriculums.

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Author's Note

Readers may request a complete copy of the *1996 Texas Printers' Wage and Benefit Survey* or the *Texas Printers' Technology Use Survey* by contacting the author at the University of Houston, 4800 Calhoun Rd., Houston Texas, 77204-4083 or by E-Mail (JWAITE@UH.EDU).

Those of you who know the author also know how difficult it was for him to write “the Macintosh enjoys a *slight* edge over the PC in production” because he is a die-hard Macintosh fanatic. Unfortunately, the facts speak for themselves.