



Visual Communications

Journal 2002

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* denotes refereed article ** denotes juried article *** denotes edited article

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How We Produced the Journal

All articles were submitted electronically in the Microsoft Word format. All photographs were submitted digitally and were edited and converted to grayscale using Adobe Photoshop. Graphs and tables were created from Adobe Illustrator or QuarkXpress. Page design and layout, were accomplished using QuarkXPress. The file was converted to a press-optimized PDF which was then e-mailed to Western Wisconsin Technical College for imagesetting, platemaking, printing, and binding.

About the Journal

The Visual Communications Journal serves as the official journal of the International Graphic Arts Education Association, Inc., and provides a professional communicative link for educators and industry personnel associated with design, presentation, management, and reproduction of graphic forms of communication. Manuscripts submitted for publication are subject to peer review by the Association, and the views and opinions expressed herein are those of the authors and do not necessarily reflect the policy or views of the IGAEA.

Article Submission

Please follow the guidelines provided on page 53 of this Journal.

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Editor's Note

Congratulations to all the authors whose articles are being published in the 2002 *Visual Communications Journal*. I believe you will agree that they have done an excellent job of providing useful and timely information to others in the profession.

With the exception of student articles, all of the manuscripts are blind reviewed by a jury of graphic communications professors. Based on the jury response, the accepted articles are designated as edited, juried, or refereed. In the case of student articles, the editor makes a decision on acceptance.

The 2002 Articles

The first article in the 2002 *Visual Communications Journal*, by Penny Osmond at California Polytechnic State University and Jerry McMurtry at the University of Idaho, provides an overview of research which was conducted to compare on-site and web-based delivery of industry training. Even though no significant differences were found, distinct advantages were found for each method. As this technology continues to advance, this issue certainly need to be revisited.

Chris Lantz from Western Illinois University shows how instructors can teach graphic production with free and open-source

software. Instead of using lack of funds as an excuse for not teaching certain applications, he shows how software can be obtained with little or no funds. A wide variety of products are presented, and I suspect many will be new to you as they were for me.

One of the important aspects of the history of graphic communications is the origins of hypertext, and Bill Havice from Clemson University does a nice job of providing this foundation. He provides all the detail you will need for a nice lecture on this topic, or as an option, that students can access online, www.igaea.org.

Rita Dobbs, from The University of Texas at Tyler, provides a synopsis of her research on training educators to use interactive television and distance education. She compared concerns of educators who receive only classroom training on distance education with those who receive both classroom training and laboratory experiences. Her results indicate that the addition of laboratory experiences enhances the training considerably, and this supports previous research that shows that users of telecommunication systems greatly benefit from in-depth training.

A team of authors (Gillispie-Johnson, Dunn, Brown, and Childress) from North Carolina Agricultural and Technical State University provide a plan and rationale for a communication laboratory with a wide variety of telecommunication and instructional tools needed by students for basic understanding of this cutting-edge technology, and needed by instructors for delivering courses in a variety of distance and face-to-face formats. This should help others proposing such a laboratory.

I worked with my doctoral student, Mengtsung Tai, University of Northern Iowa, to develop a practical article on scanning basics. This is information that might be of help to instructors as they develop a lecture on this topic, or as assigned reading. By the way, in order to be fair to the other authors, this article was blind reviewed by the jurors also.

Jason Schmid, from Washington State University, provides the case for using student-produced film in the classroom. He believes that this provides students a depth of experience with topics not easily taught in other ways. This might provide you some new ideas for class assignments.

There are two student articles in this year's *Visual Communications Journal*. Jonathon Guy from Pennsylvania College of Technology discusses the advantages of using dual processing, which is found on the Apple Power Macintosh G4. Mengtsung Tai, from the University of Northern Iowa, provides a short overview of premedia, a term which he thinks may replace prepress in the future. Thanks to both of these students for submitting their articles for publication.

The People Who Made This Journal Possible

This year's jurors are Tom Gray, Z. A. Prust, and Dan Wilson, well known professors in the graphic communications field. I believe each of these people were actually too busy to assist with the review process, but helped out anyway because of their sense of professionalism. Thanks to each of you for your dedication and hard work.

I also need to thank the design and printing team for this year's journal. The design and layout, with the exception of the cover, was done by University of Northern Iowa students Mengtsung Tai, Wendy Loeffler, and Juli Camarin. In fact, I thought I should also give Mengtsung the title of Assistant

Editor for the many extra hours he spent on the journal. I simply could not have done this without their help. I was amazed to watch them work on the design, and pore through each article to assure consistent style.

Gene Van Roy, with the help of his students at Western Wisconsin Technical College, has printed most of the *Visual Communications Journals* since 1991, and has contributed untold hours to the International Graphic Arts Education Association. It becomes a family affair at crunch time and his wife Kathy and daughter Sarah help with manually collating the journal, as well as preparing the journal for mail out, which is a huge job. We owe each of these individuals a huge debt of gratitude.

Janet Oglesby is an instructor in the Electronic Imaging and Printing Program at Western Wisconsin Technical College and has also put in countless hours on the *Visual Communications Journal*. She is in the prepress area, and assisted this year with film output, as well as final journal assembly and mail out. Thanks for all your hard work Janet.

Speaking of Western Wisconsin Technical College, Paul Casper, a

first year Graphic Design student, is to be congratulated for designing the 2002 *Visual Communications Journal* cover. This is excellent work, and another fine example of the capabilities of our students.

As you can see, this journal is certainly a team effort, and I appreciate all that each person accomplished. I am deeply honored to be able to work with such a fine group of professionals. Thanks again for all your effort.

Charles D. Johnson, Editor
2002 *Visual Communications Journal*

Graphic Communication Industry Training: A Critical Comparison of Knowledge Gained and Satisfaction of Learners Between On-Site Delivery and Web-Based Delivery

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Introduction

There is a need for training in the graphic communication industry (Osmond, 1999). Companies that provide training to their employees are more likely to remain competitive. Technology has brought about change for the graphic communication industry and created more of a need for training. However, not all companies can afford to send their employees somewhere for outside training. Technology has enabled training within some industries to be conducted using the World Wide Web.

According to Schreiber & Berge (1998), there is an inherent dichotomy between organizational training and academic education. Education is a process of acquiring new knowledge typically through some type of school or university. Education is aimed at enriching and expanding the lives of individuals to enhance their role in socie-

ty and within a profession. Schrieber also believes that a goal of education is to help individuals develop self-directed learning skills for continued personal growth.

Training addresses specific skills and knowledge that help improve job performance. Organizations need current knowledge and skills, but are also finding that lifelong learning is a necessity (Schrieber, 1998). With the increase in technology and consequently the short shelf-life of knowledge, it is important to encourage employees to develop self-directed learning skills to be competitive.

Senge (1990) and Buhler (1999) point out that today's emphasis should be on the learning organization. A learning organization focuses on employees becoming life-long learners. The development of the workforce, including life-long learning, is necessary to successfully compete in today's world.

According to Kouzes and Posner (1995), we are in a new global village in which we are all connected electronically, yet the world is more diverse and fragmented than ever before. They emphasize the reality that knowledge is the new currency. Competition is fierce. The digital revolution is upon us. Printing companies are facing the same issues as other technology-driven businesses. To stay competitive, they must invest in the technology and decrease the production cycle. As with all new technologies, the need for training is greater than ever. Even for the graphic communications industry, knowledge is becoming the new currency.

Educators are finding alternative ways to deliver education to students unable to attend the institution. Educators have experimented with many alternative forms of delivering education. Some of these forms of delivery have included correspondence using the U.S. Postal Service, radio, TV & video-tape delivery, video-conferencing, CD/DVD delivery, compressed-video and recently the World Wide Web. Research has been conducted on the effectiveness of distance learning in terms of student learning. Ferguson and Wijekumar (2000)

found that web-based instruction for safety professionals provided a convenient and quality learning environment for students. They concluded that students achieved “the true value of learning” and “were able to seek, analyze, synthesize and apply knowledge to real-life safety issues”(p. 32).

Graphic Communication Industry

There has always been a need for training in the graphic communication industry. The transition from analog data to digital data for graphic arts companies makes the training needs greater than ever. According to Wilken (2000), “The graphic arts industry also is a witness to the need for technical, marketing, and general business learning and training programs in order to stay abreast of changing technologies”(p.103). Wilkens assessed six major industry organizations that offer various types of training and found that none of them offered on-line training.

Training for the graphic communication industry has traditionally been delivered through on-site training, conferences, workshops, trade-shows and on-the-job-training. Recent technologies have provided training

options through CD/DVD and tutorial textbooks specific to particular software. A few schools and companies are offering training in the graphic communication industry using web-delivery. Wilken (2000) mentions Rochester Institute of Technology and Arizona State University as two schools offering distance learning courses. However, very little is being done in the graphic communication industry in the area of web-based education or web-based training.

Effectiveness and Cost

It is important to conduct research regarding the effectiveness of training delivered using the World Wide Web compared to traditional training methods. There is a need for training in the graphic communication industry yet sending an employee to a seminar, conference or workshop is expensive. Not all companies can afford to provide this type of training for their employees. If web-training is as effective as traditional training methods it may provide a cost-effective alternative for training needed in many companies. It may give the companies the advantages they need to stay profitable and competitive.

Purpose

The purpose of this research was to study two different methods of delivering training, on-site and web-based, to employees in the graphic communication industry. The study measured and compared the knowledge gained between the two methods and also measured trainee satisfaction between the two methods.

Research Questions

This research addresses two questions specific to training in the graphic communication industry.

1. Is there a difference in knowledge gained between training offered on-site at a training center and training offered using a web-based method of delivery?
2. Is there a difference in trainee satisfaction between training offered on-site and training offered using web-delivery?

Methodology

Subjects

The population of interest for this study was employees working for companies belonging to Printing Industries of America, Southern California (PIASC), Printing Industries of Northern California (PINC) and employees working in San Luis Obispo County printing

companies. A group of 327 companies were randomly selected from PIASC and PINC membership lists and asked to voluntarily participate in the study.

Convenience sampling was then conducted with San Luis Obispo County printing companies. Companies were allowed to have more than one employee participate in the training. A total of 16 companies agreed to participate with a total of 21 people agreeing to complete the study. Once the 21 participants were selected, they were randomly assigned to either the control group (on-site training) or the treatment group (web-based training).

Design

This study was an experimental design, specifically using a Pretest-Posttest Randomized-Groups Design. A quantitative questionnaire, The *Student Satisfaction Questionnaire* (SSS), was also used to measure learner satisfaction.

Training Curriculum

The Graphic Arts Technical Foundation (GATF) Imaging Skills Curriculum was used as the content delivered to both groups. The GATF curriculum is currently in the form of CD-ROM instruction. It is designed to be delivered by a

face-to-face instructor. Knowledge gained was measured using the written exam included in the curriculum as a pretest and a posttest.

Instruments

Each group was given a comprehensive written pre-test from the *GATF Imaging Skills Training Program* at the beginning of the study. Training was then conducted for both groups. Upon completion of the training, each group was given the same comprehensive written exam as a post-test. The pretest/posttest used was from the Imaging Skills curriculum developed by GATF. The pretest/posttest was used as the instrument to measure the knowledge gained. The instrument is reliable for measuring knowledge since it is a standard instrument used in the industry to determine knowledge gained after completing the *GATF Imaging Skills Training Program*.

A quantitative survey was given measuring student satisfaction. The *Student Satisfaction Survey* (SSS) is an established questionnaire (Biner, 1993) slightly modified by the researcher to collect data reflecting the appropriate methods of delivery. Biner developed and used the SSS to measure learner satisfaction in televised courses. Terminology

was changed to reflect the web-based delivery method rather than the televised delivery method. The same Likert scale was used on the SSS as was used in Biner's study. Since the SSS was originally designed for televised courses it can be considered reliable for measuring satisfaction specific to that method of delivery. Since it was slightly modified for this study, it cannot be considered completely reliable for web-delivered courses. It did, however, provide data for this study to be examined with regard to student satisfaction.

Procedures

Companies assigned to the control group were allowed to send one or more employees to the on-site workshop that was conducted over a one and a half-day period. A total of twelve employees completed the workshop representing seven companies.

Companies assigned to the treatment group were allowed to have one or more employees participate in the web-based workshop. This workshop was conducted over a four-week period to allow employees to continue working at their job. A total of nine employees completed the workshop representing eight companies.

The same instructor, who was also the researcher, taught both workshops. This served to control any bias in instruction between the two groups. Because the researcher was the instructor, this could potentially pose a threat by including a bias by the researcher towards good results. To control for this bias, the researcher did not promote or advocate one method of delivery over the other during the research to anyone involved in the study. The researcher tried to control any bias throughout the study in any form.

Conducting the Training

The curriculum used for both groups was the Graphic Arts Technical Foundation (GATF) Imaging Skills Curriculum. The curriculum consists of five modules representing the entire printing process. Since this study focused more on training specifically in the prepress area, only three of the five modules were presented to participants. The on-site training was conducted in a one and a half day time period. The web-based training was conducted in a four-week time period. The same material was covered in both groups.

The on-site participants received the information through the use of lectures, PowerPoint pre-

Table 1: Raw mean scores for difference between pretest and posttest

Condition	<u>n</u>	Mean Score
On-site delivery	12	11.25
Web-based delivery	9	10.67

sentations and classroom discussion. Hands-on exercises were required and students were allowed to take self-study quizzes which reinforced the concepts taught. Once the training was completed each participant was given a posttest and a quantitative Student Satisfaction Survey.

The web-based participants received information through the use of e-learning software called Blackboard CourseInfo. Each participant also received a set of CD's made by GATF that were designed to instruct people taking the Imaging Skills Curriculum. The same questions that were asked in the classroom discussion for the on-site group were posted in the discussion board within Blackboard. Instructions were provided that included reviewing materials on the CD, taking self-study quiz assessments, participating in the discussion board questions and participating in the same hands-on exercises that were given

to the on-site group. Once the training was completed each participant was sent a posttest and quantitative Student Satisfaction Survey.

Results

Nonparametric statistical tools were used to determine if a significant difference existed between the group that received the on-site training and the group that received the web-based training. Analysis was done for both knowledge gained and satisfaction of the learner. An alpha level of 0.05 was used for all statistical tests.

Knowledge gained was measured by the difference in participant scores from the pretest to the posttest. The pretest/posttest used was from the standard Imaging Skills curriculum developed by GATF. The test score was from a possible 60 points. The differences between the pretest and posttest scores ranged from 1 to 33. A Kruskal-Wallis analysis was used to

Table 2: Raw mean scores for student satisfaction survey

Condition	<u>n</u>	Mean Score
On-site delivery	12	31.75
Web-based delivery	9	29.44

compare the mean scores to each other. The on-site group had twelve participants (n=12) while the web-based group had nine participants (n=9). The mean scores for the difference in participant scores from pretest to posttest between the on-site group and the

were compared between the on-site group and the web-based group. The mean scores for SSS between the on-site group and the web-based group were 31.75 and 29.44 respectively (see Table 2). A score of 24 would represent an overall satisfaction of *Average*, while a

web-based group in knowledge gained, $X^2 (1, N=21)=.046$, $p=.830$.(see Table 3).

A Kruskal-Wallis analysis was used to compare the mean scores to each other. The analysis revealed that there was no statistical difference between the on-site group and the web-based group in learner satisfaction, $X^2 (1, N=21)=1.56$, $p=.212$ (see Table 3).

Analysis and Discussion

This study addresses the question of whether web-based training can be a viable option in the graphic communications industry. As stated earlier, there was no significant difference between the web-based group and the on-site group for measurement of both knowledge gained and satisfaction of the learner.

A Kruskal-Wallis analysis was used for analysis of knowledge of learning gained for the on-site delivery (control group) compared to web-based-delivery (treatment group). It was also used for analysis of learner satisfaction between the two groups. The sample sizes for the control group and treatment group were twelve and nine respectively. The Kruskal-Wallis analysis was used because of the small group sizes. This particular analysis met the non-parametric assump-

Table 3: Test statistics for Kruskal-Wallis

Source	<u>df</u>	X^2	<u>p</u>
Difference between pretest and posttest	1	.046	.830
Student Satisfaction Survey	1	1.556	.212
<hr/>			
p < .05			

web-based group were 11.25 and 10.67 respectively (see Table 1).

Satisfaction was measured using a quantitative *Student Satisfaction Survey* (SSS) using a Likert Scale. A total score was generated from each questionnaire. Scores could range from 8 to 40. Mean scores

score of 32 would represent an overall satisfaction of *Good*. Both mean scores then are most comparable to an overall satisfaction of *Good*.

The analysis revealed that there was no statistical difference between the on-site group and the

tions required for use of the Kruskal-Wallis test.

In the study of adult education and training there are two schools of thought that should be considered when considering the impact of training on employees, the behaviorist and constructivist theories. The behaviorist theory focuses more on the observable behavior rather than the inner workings of the mind (Rich, 1971) while the nature of constructivism is based on a person's experiences and their ability to interact with and gain understanding of their experiences (Tobin, 1992). Employees working in a particular profession will have more of a need to know information that directly applies to their profession. A student in an educational environment may not have as much need to acquire the information. The experience is therefore less personal to a student seeking an education than it would be to an employee seeking training. Learning in a work environment may have advantages over learning in an educational setting (Berge, 1998).

Even though both groups in this research received information differently, both groups had the experience of applying the information to their current jobs. The hands-on component of the work-

shop further enabled learners to construct their own knowledge base. Since there was a need for both groups to acquire the knowledge and take that knowledge back to the job, there was a viable reason to acquire the knowledge. Therefore, the results of this study follow the constructivist's view of learning primarily because of the employee's abilities to construct knowledge based on their own reality as it related to their jobs.

The graphic communications industry is a very production and deadline oriented industry. Efficient production of printed material is essential to a company's survival. The need for training in the graphic communications industry is not in question. The question is how companies can provide the training needed in a cost-effective manner while maintaining the production deadlines needed for the company. Sending employees to another site could be costly and can impact productivity on their job. Bringing a trainer into the company could also be costly and could interfere with employee productivity. Self-directed learning strategies such as tutorial books, video tapes or CD / DVD's are good alternatives but require the employee to find the time and the self-motivation to

complete the training. Sometimes without an instructor or supervisor involved completion can be difficult. Although web-based training is not a cure-all for a company's training needs, it can fill a void in training were other methods may not work.

Conclusions

In conclusion, this study determined that there was no significant difference between web-based training and on-site training for both knowledge gained and satisfaction of the learner. If circumstances permit, most people would prefer to learn in a face-to-face environment with the ability to interact with instructor and students in the same room. When that is not an option, web-based training is a viable alternative to face-to-face learning.

Efficient production is a key to success within graphic communication companies. Training can help an employee become more efficient. However, finding the time to provide training is often a challenge. Taking time to train means taking time away from production. Cost can also be a deterrent for providing training. If cost and time were not an issue, most employers would probably prefer to send

their employees to a professional training facility, which is more flexible for working around a production deadline environment.

Unlike other self-directed training methods such as books, video or CD/DVD tutorials web-based training can offer the advantage of instructor and student interaction. Web-based training can offer on-line testing providing immediate feedback and assessment to the learner. Web-based content can also be updated more readily. Web delivery will not replace other methods of delivering training just as web-based newspapers and journals have not replaced traditional newspapers and journals. It is anticipated that technology will increase in both sophistication and quantity of users. As this occurs web-based training will become more readily available to companies.

It is recommended that further studies be conducted comparing the knowledge gained between students learning in a classroom and employees learning on the job. It is further recommended that studies be conducted comparing the cost of training for web-based training to on-site training.

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Dr. Penny Osmond is an Assistant Professor in the Graphic Communication Department at California Polytechnic State University. She teaches in the areas of electronic publishing, digital file preparation/assessment and consumer packaging. She has been teaching since 1987 and has experience in high school, community college, four-year college and university level teaching. Penny has a Ph.D. in Education from the University of Idaho in Moscow, Idaho. Her Master's degree is from University of Nevada, Las Vegas and Her Bachelor's degree is from Ferris State University in Big Rapids, Michigan. Her areas of expertise are in file creation and preparation for successful output, workflow and output issues and packaging prepress including including preparation for the flexographic printing process.

Dr. Jerry McMurtry is an Associate Professor in the Division of Adult, Counselor & Technology Education at the University of Idaho. He teaches undergraduate technology courses and graduate adult education and human resource development courses. His interest and research areas focus around the nature of adult learning in the workplace. He holds both bachelors and masters degrees in business and a Ph.D. in human resource development from Colorado State University.

Manuscript Guidelines

Eligibility for Publication

Only members in good standing of the International Graphic Arts Education Association, Inc., or students of IGAEA members, may publish in the *Visual Communications Journal*.

Audience

Write articles for educators, students, graduates, industry representatives, and others interested in graphic arts, graphic communications, graphic design, commercial art, communications technology, visual communications, printing, photography, journalism, desktop publishing, drafting, telecommunications, or multi-media.

Present implications for this audience in the article.

Types of Articles

The *Visual Communications Journal* accepts four levels of articles for publication:

1. Edited articles are accepted or rejected by the editor. The editor makes changes to the article as necessary to improve readability and/or grammar. These articles are not submitted to a panel of jurors. The decision of the editor is final.
2. Juried articles are submitted to the editor and are distributed to

jurors for acceptance/rejection. Juried articles are typically reviews of the literature, state-of-the-art technical articles, and other non-empirical papers. Jurors make comments to the author, and the author makes required changes. The decision of the jurors is final.

3. Refereed articles are submitted to the editor and are distributed to jurors for acceptance/rejection. Refereed articles are original empirical research. Jurors make comments to the author, and the author makes required changes. The decision of the jurors is final.
4. Student articles are submitted by IGAEA members. These articles are accepted/rejected by the editor. These articles are not submitted to a panel of jurors. The editor's decision is final.

Manuscript Form and Style

Prepare manuscripts according to the APA style, including the reference list.

Submit a maximum of ten word-processed, 8.5" X 11" pages (excluding figures, tables, illustrations, and photos).

All articles *must* be submitted in electronic form and as a hard copy. Articles can be submitted on a 3

1/2" disk, Zip disk, CD-ROM, or as an e-mail attachment.

The text should be submitted in the Microsoft Word format. *Do not* submit documents created in page-layout programs.

Call out the approximate location of all tables and figures in the text. These call-outs will be removed by the editor.

List your name and address on the first page *only!* Article text should begin on the second page.

Artwork

You may submit either digital artwork or hard copies. Electronic artwork is preferred. Place all artwork files and/or hard copies with the first submission.

If you choose to submit only hard copies of artwork, send clean, crisp, camera-ready artwork (lines and figure text *must* be solid black).

Identify all hard-copy artwork on the back with your name, brief article title, and figure number.

Electronic artwork is preferred *if* you can provide EPS or TIFF files only. No PICT, BMP, WMF, or JPEG files will be accepted. Include hard copies and electronic files.

Scan photographs at 300 ppi resolution. Scan line drawings at 800 ppi resolution. Screen captures should be as large as possible.

Submittal of Manuscript

Manuscripts for juried or refereed publication in a given year must be received by the editor no later than December 15th of the previous year. Articles for edited publication or student articles must be submitted by January 15th of the publication year.

The manuscript packet must include digital and hard copies of all text and figures. Prepare text and artwork according to the instructions given in these guidelines.

Be sure to include your name, mailing address, e-mail address (if applicable), and daytime phone number with your materials.

Acceptance and Publication

If your article is accepted for publication, you will be notified by e-mail or mail.

If your article is accepted, submit the following: biographical information; portrait (black and white photo or pre-scanned grayscale photo on disk); edited electronic version of the text that includes any edits recommended by the referees; and original art-

work (if any) or edited digital artwork. *Do not* include your biography or portrait until you receive notice that your article has been accepted.

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