

Globalized Graphic Communications Education: Designing an Undergraduate Curriculum

John R. Craft

The internationalization of businesses and industries in the digital age has generated concern among graphic communication educators as they plan curricula for students entering a workforce that is becoming more globalized. Moreover, global learning is becoming an accreditation requirement for universities in order for students to compete in a world driven by international business.

Advancements in desktop or portable technologies have opened opportunities for collaborative curricular efforts toward a worldwide study of graphic communications. Opportunities exist for universities and colleges to use technology to reach other schools of higher education offering graphic communication to expand learning opportunities for students and faculty. The availability of an international dimension to graphic communications education provides students and faculty with opportunities to do research collaborations, exchange ideas for project assignments, as well as learn language and culture. In order for college level students studying graphic communications from the United States to be competitive in a global workforce, an international graphic communications curriculum must therefore be developed. Consequently, guidance from industry advisory board members becomes essential in ascertaining a relevant learning path to produce an international curriculum in graphic communications.

1. Introduction

The question, "what are students expected to know" in preparation for a career in graphic communications is challenged by evolving technology driving the curriculum. During the 1970s, curriculum change in higher education was mostly piecemeal, incremental, and unplanned (Wood and Davis, p. 3). The intricacies involved in the development of a college course of study are due to perceptions of educators and their definition of curriculum. Mastery of competencies became a national concern throughout the 1990s with involvement of the United States Departments of Labor and Education (Craft, 1998). According to Eraut (1994), qualifications – which are based on competencies – that professionals have, are different from the competencies that are derived from the syllabi found in universities preparing students for occupations such as management. He noticed that there is disagreement with the higher education design of what students are expected to know in order to become qualified for entry-level positions in industry.

The introduction of new technology to a course of study furthers the complexity of curriculum design (Craft, 1998). The accelerated change occurring in the graphic communications industry has placed pressures affecting college or university graphic communications management curriculum (Lewis, 1996; Peck & Compton, 1994). Rapid change is a challenge for anyone involved in the design and development of curriculum (Lauda & McCroxy, 1986).

Major computer software upgrades generally occur every 18 to 20 months – caused by demand for efficient

tools. Refinements to printing and digital media continue to improve, as well. Students choosing graphic communications as a major study must realize during their three to four years of education, they have to be ready for a career that may span thirty to forty years. The graphic communications educator has to develop a curriculum that prepares students to become adaptable to a changing technology and workforce.

As technology continues to develop, the world gets smaller. Students are finding "study abroad" as a great opportunity to enhance their learning and increase their marketability in the graphic communications industry. Universities such as Appalachian State University are including provisions for international studies in the general education requirements.

2. The Importance of Advisory Boards

Efforts to develop a curriculum guide for graphic communications attempting to address the personnel needs of the printing industry are being made on account of an evolving technology. Guiding the learner towards preparation and practice in developing competencies or skills in being able to produce a printed product have been approached by educators in consultations with members of the graphic communications industry. These representatives of industry are voluntary and serve as members of an advisory board bringing their professional expertise from outside of the university community (Dorazio, 1996). Advisory boards made up of members from the industry or the business of print offer graphic communications education a tremendous amount of support in developing

curriculum or providing support in the way of financial or "gift-in-kind" donations.

The role of the advisory board is to confirm that instructional content is relevant to the practice of the graphic communications industry. Advisory board members in cooperation with faculty examine curriculum revisions and may make recommendations contributing to the refinement of the graphic communications curriculum. For example, the advisory board for the Northern Alberta Institute of Technology provides advice to faculty to make the graphic communications curriculum "reflect current technologies and trends" (Retrieved May 15, 2009, from http://www.nait.ca/program_home_15318.htm).

The formation of an advisory board begins by identifying key leaders in the industry located in the state or region of the university. The Printing Industries of the Carolinas (PICA) maintains a list of printing companies (members or nonmembers in North and South Carolina). Service on the advisory board is typically by invitation of the program or department representative from within the university. A representative of the university will determine those companies able to participate and contribute to the growth of the graphic communications education. Advisory board members also provide recommendations for equipment and sources of supplies. The key to an effective advisory board is in communication and its ability to apply expertise in areas of job descriptions, employee preparation, and equipment needs. It is imperative that regular contact with the board be managed by a liaison such as the presiding chairperson.

Bylaws are necessary for advisory boards, to guide them on proper protocols in their relationship with the graphic communications program, department, college, or university. Having bylaws are typical of the requirements by accrediting agencies such as the Accrediting Council for Collegiate Graphic Communications and the Association of Technology, Management, and Applied Engineering (formerly the National Association of Industrial Technology).

Involvement of the advisory board in organizing career specific events also contributes to awareness of job titles and descriptions. Every year the Graphic Arts and Imaging Technology program at Appalachian State University, conducts Career Connections – an event that brings together industry representatives, students, faculty, and administrators. About 15 to 20 companies participate in this event that provides students with the opportunity to interview for internships or an actual job. Students prepare

for Career Connections by taking a seminar course offering topics on résumé and cover letter writing.

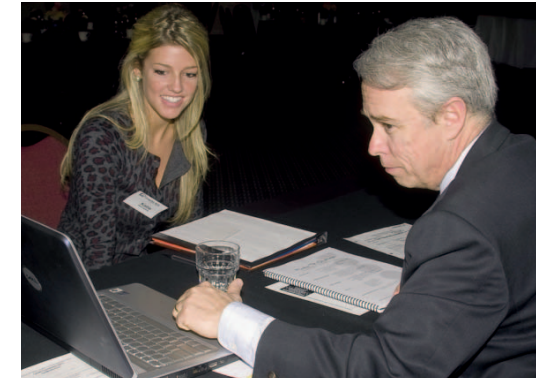


Figure 1: Katie Guthrie, a Graphic Arts and Imaging Technology major, interviews with Jeff Stoudt of Printing Industries of the Carolinas during the 2010 GAIT Career Connections.

Engaging advisory board members in the process of revitalizing the graphic communications curriculum is an effective means for gathering opinions. Open-ended questions can be asked to begin the process of shaping a curriculum to the expectations of industry. This is necessary in gaining a perspective from industry on a curriculum that prepares individuals with the proper preparation for a career in graphic communications.

3. The Industry Perspective of the Graphic Communications Curriculum

A pilot test to gather opinions from members of the graphic communications industry was developed to obtain industry perspectives. Five categories were established to provide a starting point for industry members to provide their option.

The first category provides a view of their company. Two members of the Graphic Arts and Imaging Technology Advisory Board and a non member from industry participated in the pilot study to test the effectiveness of the opinionnaire. They were then asked to share their opinions on student preparedness and the state of the graphic communications curriculum. The form was kept short with open-ended questions, similar in design to the first round of a Delphi Technique. This research design follows the structure of case study design for the reason of accessing thoughts based on experience (Merriam, p. 29).

Their opinions are based on their impressions of graduates from area universities offering graphic arts or communications degrees.

From this pilot study, refinements to the opinionnaire can be made so that more industry professionals can be contacted for their views on the preparation of students and the refinement of the Graphic Arts and Imaging Technology curriculum. Although this was a small test sample, useful information was obtained from those participating.

4. Results from the Pilot Study

Comments from the first and second respondents are included in the following:

Category 1: Company Information

- Number of employees: **R1** = 225; **R2** = 13; **R3** = 4400
- Primary business: **R1** = Advertising / Marketing / Public Relations; **R2** = Business, Printing; **R3** = Major converter of flexible and specialty rigid packaging
- Location: Two respondents are located in Greenville, SC; one Atlanta, Georgia (24 production facilities worldwide)

The first respondent works in a company employing 225 workers, with a primary business of advertising, marketing/public relations, and business printing. This company is located in Greenville, South Carolina.

The second respondent works in a company employing 13 workers, producing "business and printing" products. This company is also located in Greenville, South Carolina.

The third respondent works in a company employing 4400 employees that work in facilities worldwide.

Category 2: Student Preparation

- Has your company hired a graduate from a 2-year or 4-year graphic communications program/department/school or college within the last five years? **R1**=Yes; **R2**=Yes; **R3**=Yes
- Do you feel the graduate was prepared/qualified to adequately meet the production expectations of the company? **R1**=Yes; **R2**=No; **R3**=Yes
- Describe areas in which the graduate was most prepared (example: highly knowledgeable with computers, understood the production workflow, quickly adapted to the expectations of the company, or other expectations.)

R1 = They had a good understanding of all printing processes, colour theories, graphics software and had interned with either an ad agency or commercial printing company.

R2 = Well Rounded Background but not in-depth on any subject

R3 = Cannot gain understanding of specific company requirements until employed by company. This means graduates should realise there is much to learn when they first start with organization.

- Describe areas in which the graduate of a graphic communications program/department/school or college required more preparation.

R1 = They needed more time working 'hands-on' with files and printing processes to make sure the two were compatible. In the end, we accepted these deficiencies and supplied additional training for these new, entry-level graduates to bring them up to standard.

R2 = Understanding practical printing instead of theory.

R3 = Understood background on computers/software to quickly acquire specific knowledge about company requirements. Several did internship with company, so they already had a background with our company and department requirements.

- Would you please comment on this category:

R1 = Each new employee has the opportunity to lend their own unique skills and we as the employer have the opportunity to allow them to use these skills. Ultimately, employees are happiest when they are performing a job that is both challenging and rewarding in an area they enjoy.

R2 = No response provided.

R3 = Basic design considerations for the specific printing process (design review for optimal print results). Requires understanding of fundamentals of graphic design, registration, trapping, type specifications.

The second category's purpose was to gather opinions concerning student preparedness from colleges/universities. It was clear from the response that the smaller company was not satisfied with the student or students graduating from college/university graphic communications program. There is the potential to gather more information regarding the level of preparedness and the college

or university program the graduate or graduates hired matriculated. Further refinement to this question is necessary to determine why the respondents were satisfied or not satisfied with the recent hire of a college or university graduate of a graphic communications program/department/or college.

However, useful information was provided, specifically from the item "Describe areas in which the graduate of a graphic communications program/department/school or college required more preparation." Respondents recognize the importance of preparing students with more practical "hands-on" experience.

Respondent Two did not add a comment to the final section of the second category question.

Respondent Three has the strongest view and understanding of internationalizing the graphics curriculum for the reason of having participated in the Association internationale des étudiants en sciences économiques et commerciales" or "International Economic and Commercial Sciences Students Association" or AIESEC program. This global youth organization program is present in over 110 countries and territories provides young members with leadership and internship opportunities (retrieved from <http://www.aiesec.org/>).

Category 3: Curricular Development and Improvement

- What do you feel is most important for college-level education in the study of graphic communications? **R1** = A good knowledge of all printing processes and applications for these processes. **R2** = Understanding digital workflow applied to real world expectations

- What are college graduates expected to know when considered for employment at your company?

R1 = That they can fit into a current job position or add another needed, new skill (See accompanying job description for associate production manager)

R2 = Basic understanding, more important is the newly employed individual and their attitude/potential

- Are you familiar with the National Council for Printing Skill Standards? **R1** = No; **R2** = 2; **R3** = No

If so, do you use it as a guide for identifying employee competencies?

R1 = N/A; **R2** = No response provided; **R3** = No

- Are you familiar with PrintEd?

R1 = No; **R2** = No; **R3** = No

If so, do you use it as a guide for identifying employee competencies? **N1** = N/A; **R2** = No response provided; **R3** = No response provided

- Please comment on your experiences with the National Council standards and/or PrintEd? **R1** = N/A, **R2** = No response provided; **R3** = No response provided

The opinions collected from the third category revealed that all respondents are not familiar with PrintEd and the National Council for Printing Skill Standards. It is not known why they were not aware of these industry-supported programs. Furthermore, recommendations were offered as what is most important for college level graphic communications education.

Category 4: Curricular Design

- What would you expect students to experience from an international graphic arts/communications curriculum? **R1** = Not sure what would be different than a national program; **R2** = No response
- What is most important? **R1** = Not sure; **R2** = Basic understanding, good work ethics, honesty and integrity
- Expectations from partnered college or university offering graphic arts/communications. **R1** = That all have a common curriculum

Clarification is necessary for Category 4, based on comments received from the participants. They were not certain as to how to respond to the question without knowledge on the status of a national graphic communications curriculum.

However, Respondent One provided recommendations for the globalized graphic communications curriculum to include core values or acceptable work ethics.

Category 5: Other

- Can you think of other factors that should be considered in the design of a graphic arts/graphic communications curriculum that prepares students for a globalized print industry?

R1 = JDF / PDF workflows; Colour management across platforms/processes; Ability to work with foreign type faces like Kanji, etc

R2 = Better understanding of the merge of media, such as print, World Wide Web Marketing, even audio visual. If it touches the senses, we should be embracing it.

R3=Ensure the program includes, hand-on training- on press if possible, interview training (what to say, what not to say), require tradeshow participation- helps to establish key contacts in industry and learn about different companies and how they fit in the industry, internship program a must- provides work experience while still in school and can lead to hiring opportunities.

Specifically for our company department there are two niche jobs in prepress that would be excellent to develop in school. Esko operator, and Colour correction specialist. Esko requires specific Esko software interface knowledge plus excellent file assembly, trapping, step and repeat ability. Colour Correction specialist focuses more on Photoshop usage, and requires good Colour Theory understand and ability to generate colour separations optimized for the print process. Today, it is difficult to find people with these skills directly out of school, and requires on the job training and/or hiring them from existing companies.

Category Five provided respondents an opportunity to offer recommendations that can be examined from an industry perspective. Respondent Two expressed that in the nature of the business ("If it touches the senses, we should be embracing it"), changes occur rapidly and regularly. Educators would have to determine strategies for integrating the recommendations in the existing curriculum.

5. Professional/Trade Organizations

Professional organizations are also involved in shaping the graphic communications curriculum. The Graphic Arts Technical Foundation produced instructional materials useful in training learners to understand the process of printing. They used to produce learning modules requiring an audio cassette player and a 35mm carousel slide projector. Currently, new technologies and the trend in branding organizations have caused a change in the philosophy and options for instructional delivery. Michael Makin, President of the Printing Industries of America announced the removal of Graphic Arts Technical Foundation from the title – PIA/GATF – and presently (as of Jan-

uary 2009) are referred to as Printing Industries of America: Advancing Graphic Communications.

Other examples of developments in desktop computer technology have generated a new wave of production tools such as desktop publishing, image processing, computer animation, and World Wide Web. Apple Computer Corporation's introduction of the Macintosh line of computers with a graphical user interface to the public market in 1984 caused a digital revolution impacting all segments of the printing industry. A year later Aldus was formed by Paul Brainerd to produce the PageMaker desktop publishing.

An example of how institutions can use curriculum guides to offer the latest technology to their students is with Clemson University (Clemson, South Carolina). They produced a Graphic Communications curriculum in 1977 that was supported by the PICA and adopted by the South Carolina Department of Instruction. This curriculum guide included instruction of process photography, cold type composition, offset lithography, bindery and finishing. The purpose of this curriculum was to instruct the learner toward becoming qualified for jobs available in the printing industry. This curriculum was a massive effort that provided lesson plans, recommended textbooks, self-learning tutorials, and instructional guides useful in the printing laboratory environment.

Responding to a critical need by businesses to identify skills needed to succeed in "today's workplace", the United States Departments of Education and Labor funded twenty-two business-education-labor partnerships to develop voluntary skills standards for various industries in 1992 and 1993 (McNeil and Barnicle, 1996). Printing was specifically funded by the Department of Education for \$2,359,295 (McNeil and Barnicle, 1996). Through this funding, the Graphic Arts Technical Foundation conducted the National Printing Skills and Knowledge Standards Project to identify standards for three major occupational areas of the printing trades. These standards derived from industry professionals were used as a guide in developing the PrintEd Curriculum.

PrintED is another competency-based program that is supported by industry and is administered by the Graphic Arts Research Foundations. This national program is used as a guide for secondary and post secondary graphic communications education. Although PrintED does not offer a curriculum, the standards are used as a guide for aligning or shaping curriculums for secondary and post secondary education in the United States.

6. The Technology of Language

The technology of desktop or notebook computers and the portability of electronic devices combined with learning content formatted for Web Browsers reach larger populations of learners than any other media. Humans have many forms and sources of technology for learning that have been commonly available through schools having the funding to provide tools and environments to enhance education. The Internet or World Wide Web provides learning 24-hours a day, seven days a week. Time zones are not a problem for learners from various countries.

Improvements with portable technology such as Apple's iPad provide options for those interested in having access to electronic translators. A library of international language Podcasts are available and can be downloaded to devices such as iPads or iPods thus making it possible for learners to maintain practice and develop familiarity with language sounds and grammar structures. Some of the language programs are obtainable at no costs or for less than fifteen dollars.

Although language may be one problem for the learner, there are options for students using technology to translate audio and/or text from other languages. Students with access to the World Wide Web can use translator applications such as Systran's Babelfish or Google Translator. However, these translators are not completely accurate and may cause miscommunication or misunderstanding by the native speaker.

There are many electronic devices having capabilities of translating spoken or written languages. Google offers a translation Web page so that translations can be performed by inputting the language in a text field and then clicking the translate command button displayed in the Web browser. Although these translators are often an imperfect system of translation, they provide the international learner with quick reference for essential translations – such as greetings. Most universities are equipped with computer technology including access to the World Wide Web, thus providing the international learner access to these tools.

While this Google Web site does not address all of the 6,912 known human languages, it allows translations of the most common or 41 languages such as English, Spanish, French, and Chinese (traditional and simplified).

Students are at an advantage for international study or exchange programs by having learned the language and culture of countries planned for coursework. Findings from studies indicated increases of students' think-

ing skills and academic achievement from having at least twenty minutes of a second language instruction, and affirms the benefits learning a second language (Johnson, C. E., Flores, J. S., & Eillson, F. P., 1963). When developing an international graphic communications curriculum, student exchange agreements must be established between or among universities.

7. Integrating International Studies into the Graphic Communications Curriculum

Carlson (1991) found that students deciding to study in other countries for the reasons of "cultural experience, foreign language improvement, desire to live or make acquaintances from another country, interest in gaining another perspective on their home country, desire to travel, and enhancement of understanding of a particular host country". It was also found that approximately one quarter of the students surveyed planned careers in international business.

Barbara Burn (1991) explained reasons international study becomes difficult for undergraduate students to pursue:

- Students perceive that international study is expensive and would prolong their degree studies.
- International study is not clearly implemented in degree programs as integral to a specific program of study or as an elective for undergraduate students.
- Returning students have difficulty in receiving proper credit without articulated agreements with the host institution located in another country.

Faculty may also have their reasons to become involved in an international exchange program or activity. Theirs are driven by professional goals or what is perceived as scholarly requirements towards building their status and reputation as an international scholar. If the faculty member is intrinsically interested in collaborative work or building connections professionally with faculty of similar disciplines but living in different countries, then there should be support from the university's administration to encourage faculty involvement in international activities. A reason that might prevent faculty from doing international exchanges or activities has to do with family commitments. Long-term travel requires provisions for the family – a large enough home, schooling for children and full commitment of all family members with a willingness to adapt to the culture of the country.

Appalachian State University has the Office of International Education and Development that facilitates student

and faculty exchange agreements. The purpose of this organizational unit on campus is to offer services such as “international student admissions, study abroad programs, visiting exchange scholars and faculty”. There are “41 institutional partnerships in over 17 countries”, thus allowing students at Appalachian an opportunity to experience a “diverse community of students, faculty, and staff from around the world (Retrieved May 18, 2009, from <http://www.international.appstate.edu/>)”. Enrolled students at Appalachian State University interested in

participating in an exchange program would need to contact a representative from the International Education and Development to meet with a representative.

Additionally, the Department of Technology at Appalachian State University provides Web access to students interested in international study. This site provides partial guidance in getting started with an international studies program. Pertinent forms to guide students in the process of gathering required information are available for downloading to their computer.

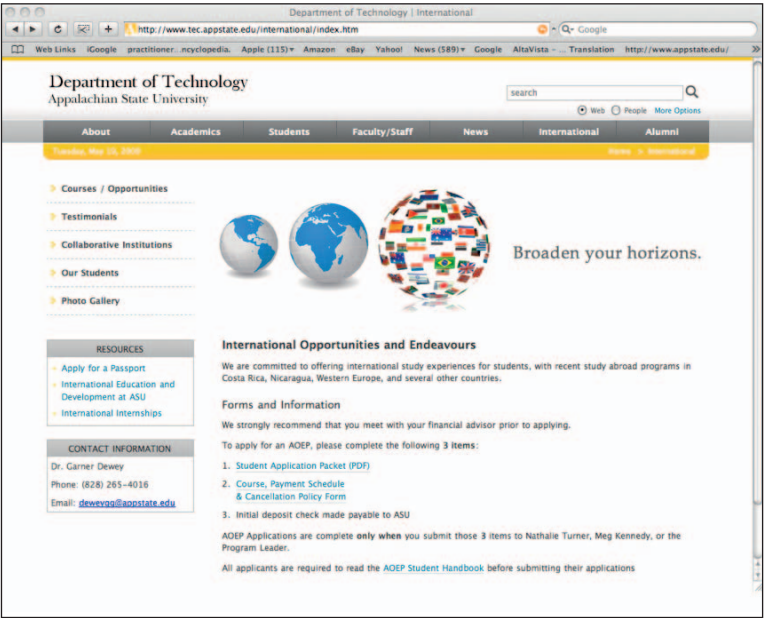


Figure 2: The Department of Technology at Appalachian State University International Studies Web page

In order for students to consider international studies in their plan for a college degree, there must be value associated with the international experience. Courses at the host (international location) universities offering graphic communications must have a graphic communications curriculum or related courses in place to contribute to the student’s plan of study.

Since the graphic communications industry is becoming more of a global enterprise, agreements between two universities must be established so that articulation of course credit and tuition payment are obtainable for the student planning to include international study towards fulfillment of their university degree.

Having an agreement established between two universities provides students with a financial advantage since they would pay the tuition at their resident university and then enrolls in courses at a university located in another country.

8. Curricular Models

Undergraduate degree programs in Graphic Communications are in flux with rapid changes in technology. Leading graphic communications programs (to include departments and colleges) such as Rochester Institute of Technology, California Polytechnical Institute (San Luis Obispo), Clemson, Wisconsin Stout, Arizona State Uni-

versity, Appalachian State University, North Carolina A&T, and Chowan University, have posted curriculums online at their institutional website. Most of these universities have an “Introduction to Graphic Communications” course that starts with a perspective of the industry based on the availability of resources or knowledge from contacts with the industry. Harvey Levenson, Professor at California Polytechnical Institute explains that “graphic communications is not an arts or a science – it’s a combination of both”.

The Introduction to Graphic Communications course is the core of the graphic communications curriculum expanding beyond the study of traditional process such as prepress, press, and postpress (Levenson, p. 1). This course would deliver a broad understanding of the graphic communications industry to students that are beginning at the collegiate level program of study learning the struc-

ture of industry as well as areas driving the technology of digital or print reproduction.

Although international experience with the development of competencies is becoming more of a value in college degree programs nationally, few students from the United States develop intercultural competence during their academic career. Dezure (2010) identified four elements commonly associated with internationalization:

- Foreign language study
- Study abroad
- Global studies
- The presence of international students

These elements must be considered in the design of a globalized graphic communications curriculum. In addition to those elements, resources that stimulate or reinforce globalized competencies must be included in the plan for a globalized graphic communications curriculum.

Undergraduate Graphic Communications Program of Study	
First Year	
Introduction to Graphic Communications	
Digital Prepress	
Introduction to Printing Technologies	
Design Reproduction Technology	
International Language Course	
Second Year	
Quality Control Systems/Colour Management	
Substrates, Inks & Toners	
Production Technologies	
Digital Printing Systems	
Flexographic Printing Methods	
International Language and Culture Courses	
Third Year	
Electronic Imaging	
Production Estimating and Scheduling	
Cross Media Publishing	
International Exchange	
Industry Internship 1	
Fourth Year	
Advanced Print Production Technology	
Web Development for Graphic Communications	
Advanced Electronic Imaging	
3D Imaging and Animation	
Industry Internship 2	

Table 1: An International Program of Study for Graphic Communications

International articulation agreements among universities are necessary to facilitate students seeking credit from schools in other countries. Table 1 is a recommendation for a program of study listing courses representative of an undergraduate degree program.

9. Conclusion and Recommendations For Continued Study

The two respondents from the larger companies of 225 employees or more have favourable opinions concerning graduates from college-level graphic communications programs compared to the opinion of the representative of the smaller company. Larger companies are prepared to work with interns by providing them with benefits such as compensation for their work by infusing them into the company as a hired full-time employees.

Further examinations of industry perspectives are needed in shaping the globalized graphic communications curriculum. Improvements to the opinionnaire based on comments received from pilot study participants could be used to generate more data for analysis to determine a trend of opinions from industry representatives.

The other purpose of the opinionnaire is to involve members of the graphic communications industry in providing recommendations toward building a globalized graphic communications curriculum. The list of courses presented in Table 1 should be provided to graphic communication educators to determine the validity for an internationalized program of study.

Input from major universities in curricular design should be collected toward the development of an international graphic communications curriculum that addresses university requirements and standards for the baccalaureate degree. Recommendations for a globalized graphics communications curriculum must also be obtained from members of organizations such as the International Circle for Institutes of Graphic Arts Education and Printing Management and the International Graphic Arts Education Association. Educational leaders from these international organizations can provide recommendations in the development of the globalized graphic communications curriculum as well as elicit involvement of industry when designing curriculum. As noted by Respondent Three, "it is difficult to find people with these skills directly out of school for the reason individuals require on the job training and/or hiring them from existing companies." By recruiting the support of industry engaged in international practices, graphic communications education can provide students with a broader view of workplace expectations.

10. References

- Carlson, J. S. (1991). Relevant Results from the Study Abroad Articulation Project. In B. B. Burn (Ed.), *Integrating Study Abroad in the Undergraduate Curriculum* (pp. 1 -6). New York: Greenwood Press.
- Craft, J. R. (1998). *The Identification of Technical Competency Areas and Subareas Essential for First-Line Managers in the Digital Printing Industry*. Unpublished dissertation, North Carolina State University, Raleigh, North Carolina.
- Wood, L. and Davis, B. G. (1978). *Designing and Evaluating Higher Education Curricula*. Washington, D.C.: American Association of Higher Education.
- Dezure, D. (2010). *Innovations in the Undergraduate Curriculum*. Retrieved September 28, 2010 from: <http://education.stateuniversity.com/pages/1896/Curriculum-Higher-Education.html>
- Dorazio, P. (1995). Professional Advisory Boards: Fostering Communication between Academe and Industry. *Business Communications Quarterly*, 59(3), 98–104.
- Eraut, M. (1994). *Developing professional knowledge and competence*. Washington, DC: The Falmer Press.
- Johnson, C. E., Flores, J. S., & Eillson, F. P. (1963). The effect of foreign language instruction on basic learning in elementary schools: A second report. *The Modern Language Journal*, 47(1), 8-11.
- Lauda, D. P. & McCrory, D. L. (1986). A Rationale for Technology Education. In R. L. Jones & John R. Wright (Eds.), *Implementing Technology Education* (pp. 15-46). Encino, CA: Glencoe, Publishing Company.
- Levenson, H. R. (2007). *Introduction to Graphic Communication*. Sewickley, PA: The Printing Industries of America Press.
- Lewis, T. (1996). Impact of technology on work and jobs in the printing industry: Implications for vocational curriculum. *Journal of Industrial Teacher Education*.34(2), 7-28.
- McNeil, P. W., & Barnicle, T. M. (1996). *Occupational Skill Standards Project*. Washington, DC: United States Departments of Education and Labor.
- Merriam, S. B. (1991). *Case Study Research in Education*. San Francisco, CA: Jossey-Bass, Inc.
- Paolillo, J.C., & Das, A. (2006). *Evaluating language statistics: The Ethnologue and beyond*. Report prepared for the UNESCO Institute for Statistics. Retrieved June 15, 2008 from: http://ella.slis.indiana.edu/~paolillo/research/u_lg_rept.pdf
- Wood, L., & Davis, B. G. (1978). *Designing and evaluating higher education curricula*. Washington, DC: American Association for Higher Education.

(first received: 28.03.2011)



John R. Craft

Appalachian State
University
Boone, North
Carolina, United
States of America

E-Mail:
craftjr@appstate.edu