MIS Skills of IS Graduates in the Republic of China

Pien Wang
National University of Singapore

M.B. Khan
California State University, Long Beach

This research investigates the skills desired of recent information systems (IS) graduates by 264 leading employers in the Republic of China (R.O.C.). It determines the employers’ levels of expectation in terms of those skills and the levels of expertise possessed by IS graduates. The results of this study are compared with those of similar studies conducted in the U.S. It is found that IS graduates in the R.O.C. are deficient in almost all skill areas. Important differences are observed between the results of the present study and those of the U.S. studies. Generally, the deficiencies in the emerging information technologies are found to be higher in the R.O.C.

Rapid advances in information technology (IT) require that the information systems (IS) curriculum at universities and colleges stay current and in tune with the changing needs of organizations. Two types of data are useful for curriculum development and revision: the needed expertise levels of various skill areas and the expertise level possessed by IS graduates in these areas. Previous U.S. surveys (e.g., Trauth, et al., 1993; Ravichandran & Gupta, 1993; Pollack, 1990; Cheney, et al., 1990; Khan & Kukalis, 1990; Green, 1989; King, 1987; Nelson, 1991) had collected the first type of data from educators, employers, and IS professionals. However, with the exception of Nelson (1991) and Ravichandran & Gupta (1993), these surveys did not gather the second type of data. In addition, different industries may have different levels of requirements for various skill areas. Few surveys, if any, collected data regarding specific industry requirements.

The development of high quality IS human resources is a top educational concern in the Republic of China (R.O.C.). By 1992, more than 60 universities and colleges were offering IS related degrees. Although these schools together produce an impressive number of IS graduates (there were about 76,400 IS professionals in 1991) (Information Industry Yearbook, 1991 & 1992), there is a lack of empirical study to determine if these graduates adequately meet the needs of IS employers in various industries.

The purpose of this paper is to report the results of a survey regarding the perceptions of 264 leading R.O.C. IS employers about two issues: the needed expertise level of various skills for an entry-level IS position and the level of skills present in IS graduates. This study also examines the differences in the needed expertise levels of skills between specific industries and the entire sample. Finally, R.O.C. results are compared with those of recent U.S. results. The results of this study can provide useful information to help universities, colleges, and other informal IS educational institutions develop an IS curriculum that can better fit the needs of employers. The comparison of R.O.C. and U.S. findings can offer insights for global generalization regarding IS educational needs.

Manuscript originally submitted January 10, 1994; Revised June 3, 1994; Accepted June 8, 1994 for publication.
This paper is divided into the following parts: first, IS education in the R.O.C. is described; second, relevant literature is reviewed; third, the methodology used for the survey is described; fourth, R.O.C. findings and discussions are presented; fifth, R.O.C. and U.S. findings are compared; last, conclusions are drawn.

Literature Review

Ravichandran and Gupta (1993) analyzed responses from 13 Fortune 500 companies regarding their perceptions of the importance of 29 IS skill areas, the desired expertise level of these areas, and the expertise level possessed by IS graduates. Of the 29 skill areas, IS graduates were found deficient in 23 areas.

Trauth et al (1993) used data from four sources - IS consultants, IS managers, end-user managers, and IS professors — to identify the key skills and knowledge that will be required of future IS professionals. Their results revealed that despite a shared vision of the future IS professional, there was an “expectation gap” between industry needs and academic preparation.

Mackowiak (1992) found that communication skills were cited as the most important desired skill of IS graduates. This information came from four IS employment advertisement sources.

Nelson (1991) addressed the issue of what knowledge and skills personnel must possess to successfully perform their jobs. In a survey of 275 employees within eight different organizations, he found out that among six different knowledge and skill areas, both IS and end-user personnel are most deficient in the area of general IS knowledge (e.g., IS policies and plans, fit between IS and organization, etc.).

Summer et al (1990) analyzed the attitudes of 34 employers toward competencies needed of entry-level IS positions. Among the 10 skills investigated, interpersonal skill was considered the most important.

Pollack (1990) surveyed the opinions of 14 high-ranking IS managers on the importance of 64 competencies required for successful job performance. The results revealed that general competencies, such as the ability to communicate effectively, good interpersonal skill, and a commitment to ethics, were considered to be as desirable as technical competencies.

Khan and Kukalis (1990) investigated the perceptions of 225 IS professionals regarding the importance of skills that contributed to their success. They found that the importance of these skills varied depending on the professional level. Generally, technical skills became less and less important as individuals moved up the career ladder.

Green (1989) analyzed the responses from 471 analysts and 401 users regarding their opinions about the importance of skills used by system analysts. While system analysts perceived verbal and non-verbal communication, diplomacy, assertiveness and politics as important, users viewed programming skill, understanding of organizational goal, training and directing as important.

Hunter (1987) analyzed the opinions of 37 respondents regarding the skills needed by IS staff. The results showed that the ability to communicate with users and technical staff was a top concern of those responsible for hiring IS graduates.

IS Education In the Republic of China

The development of sufficient number of high quality IS professionals is a top priority for the R.O.C. government. According to Information Industry (III), a quasi-government agency, that oversees the government policy on IT, the forecasted annual demand growth rate of IS professionals during the 90’s is about 10.7%. The supply of IS professionals comes mainly from graduates of IS-related programs in colleges and universities, supplemented by graduates from informal education channels such as training classes offered by not-for-profit organizations, IT vendors and professional computer training centers (Information Industry Yearbook, 1992).

By 1992, seventeen universities, eleven institutes of technology, and thirty seven junior colleges were offering IS-related degrees. In terms of quantity, the supply of IS professionals from universities and colleges will match the forecasted demand of the nation by 1994. However, the III feels that the quality of IS human resources needs improvements, because IS graduates are deficient in new information technologies (ITs), such as telecommunications, artificial intelligence, and image processing. In addition, many IS graduates do not possess an adequate knowledge of specific industries and functional areas (e.g. accounting, marketing), which are essential for building large-scale and integrated systems (Information Industry Yearbook, 1991 & 1992).

To address the quality issue, the R.O.C. government has been holding, since 1984, an annual qualifying examination for four types of IS professionals: systems analysts, senior programmers (system group), senior programmers (application group), and programmers. This examination tests the knowledge and skills of candidates in the following categories: systems analysis and design, software engineering, database manage-