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Diffusing Information Technology Education in Korean Undergraduate Public Affairs and Administration Programs: Driving Forces and Challenging Issues

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ABSTRACT

Public management information systems has been one of the core subjects in most South Korean undergraduate public affairs and administration programs since the late 1980s. Since the late 1990s, many e-government and various information policy subjects have been rapidly added to the PA curriculum. This paper examines the rapid diffusion of undergraduate-level IT education in Korean PA programs and focuses primarily on the implication of lessons developed in and drawn from Korean PA programs. The authors explain how the PA curriculum has been affected by changes in technologies, socioeconomic contexts, and government policies in South Korea; review the literature of IT education and classify IT courses taught in Korean PA programs; describe data and methods; summarize major findings on IT courses and instructors; examine driving forces behind the diffusion of IT education; and discuss the academic institutional isomorphism and challenging issues in IT education. The paper concludes with several suggestions for IT education in PA programs.

Information technology (IT) has permeated contemporary life.¹ Organizations in the public and private sectors have invested substantial resources in IT and its applications. Business schools have aggressively developed various IT courses such as management information systems (MIS), electronic commerce (e-commerce), and telecommunications. Similarly, public affairs and admin-

istration (PA) programs have added public management information systems (PMIS) and electronic government (e-government) curricular offerings.

In 1986, the National Association of Schools of Public Affairs and Administration (NASPAA) recommended that computers and information systems be recognized as a sixth skill/knowledge component in the PA curriculum (NASPAA, 1986). (NASPAA's IT standard was further broadened in 2004 to encompass consideration of the managerial and public policy implications of information technology.) However, only 15 percent of American master of public administration (MPA) programs required IT courses in 1985, 31 percent in 1989, and 56 percent in 1995 and 1998 (Kiel, 1986; Brudney, Hy, and Waugh, 1993; Waugh et al., 1995; Brown and Brudney, 1998). The slow pace of development and incorporation of IT curricula indicates that NASPAA standards and guidelines failed to fully impact American MPA program curricula as intended, at least through the 1990s.

In South Korea, by contrast, PMIS has been one of the core subjects in most undergraduate PA programs since the late 1980s. Despite a lack of guidelines comparable to NASPAA's in the United States, PMIS became widely diffused as a standard in South Korea in a relatively short period of time. Since the late 1990s, many e-government and various information policy subjects have been rapidly added to the PA curriculum as well. In 2002, 86 percent of PA programs offered at least one IT course and 76 percent offered PMIS in their curriculum.² The average number of IT courses per PA program has doubled since 1998. The number of faculty members specializing in IT has not, however, increased in proportion to the rapid growth of IT courses. This unusual constellation of diffusion factors characterizes IT education in Korean PA programs.

The purpose of this paper is to answer the following questions: How can we understand the rapid and countrywide diffusion of the undergraduate-level IT education in Korean PA programs? What were the major driving forces of this diffusion? How have PA programs responded to transformed educational and public policy environments? How have such responses affected Korean PA education as a whole? What implications for IT education can we draw from this case?

This paper does not focus on which subjects should be taught and how, but rather primarily on the implication of lessons developed in and drawn from Korean PA programs. We have a general view that PA programs need to meet social demands, and IT course offerings, as Jennings (2002) has commented, depend on the resources available and specific institutional settings.³ Not all IT subjects need to be taught in PA programs, but IT course offerings must address IT fundamentals related to management issues. In addition, it is natural, if not inevitable, that IT-related topics be integrated into substantive courses throughout the curriculum (see NASPAA, 1986, 599-560; Kraemer and Northrop, 1989, 452).⁴

In an effort to build a conceptual framework, we explain how the PA curriculum has been affected by changes in technologies, socioeconomic contexts, and

government policies in South Korea; review the literature of IT education and classify IT courses taught in Korean PA programs; describe data and methods; summarize major findings regarding IT courses and instructors; examine three driving forces behind the diffusion of IT education; and discuss the academic institutional isomorphism and challenging issues in IT education. We conclude with several suggestions for IT education in PA programs.

TECHNOLOGIES, SOCIO-ECONOMIC CONTEXTS, AND GOVERNMENT POLICIES

Public affairs and administration (PA) programs must be responsive to changing environments. The PA curriculum and specifically IT course offerings reflect technology changes, socioeconomic contexts, and government policies (NASPAA, 1986). Management tools and areas of necessary mastery continuously change as technologies progress.

IT has fundamentally altered modes of production and transaction in the information age (Davenport, 1993). The widespread and extensive uses of IT applications have significantly affected all levels of governments in various ways (Kraemer and King, 1986; Kraemer and Dedrick, 1997). Accordingly, public managers must know how to use IT applications and understand the managerial and sociopolitical implications of emerging information technologies (NASPAA, 1986; Kraemer and Northrop, 1989; Perry and Kraemer, 1993).

The PA curriculum also mirrors socioeconomic conditions. As IT and its applications become widely employed in business and social life, they come to be seen as a crucial social infrastructure, so that IT education and training become necessary in PA programs. IT education, however, is not likely to be evenly diffused through such programs. Well-resourced PA programs tend to be innovators who build exemplary models for followers. In short, resource endowments and other socioeconomic factors will affect the rate and breadth of diffusion of IT education.

PA programs and their curriculum are considerably influenced by government policies, particularly in a centralized society such as that of Korea. If governments support initiatives for public IT projects, PA scholars will be more likely to conduct IT research. More importantly, PA programs depend heavily on civil service recruitment systems, because most PA students pursue government jobs after graduation. For instance, recruitment through open, competitive examinations has been a longstanding tradition of Korean bureaucracy since the 10th century in the Goryeo Dynasty. The Civil Service Examination for Grade Five (CSEG5) has been the gateway through which higher-ranked public managers are recruited into contemporary Korean government. In order to be successful public managers, PA students have to acquire certain necessary knowledge and skills. In response to this demand, PA programs need to prepare their students for careers as public managers by incorporating relevant education and training into their curriculum.

INFORMATION TECHNOLOGY EDUCATION AND CURRICULUM

In 1986, NASPAA identified three levels of computer literacy that PA programs must provide: computing appreciation, use, and management (NASPAA, 1986; Kraemer and Northrop, 1989). Specifically, NASPAA recommended that PA programs deliver such IT courses as introduction to computing; computer applications for public managers; management of computers and information systems; analysis and design of information systems; organizational and social impacts of information systems; and information systems projects. In recognition of the differences between private and public sector MIS, NASPAA recommended that PA programs develop their own IT curriculum to respond adequately to emerging IT-intensive task environments (Bozeman and Bretschneider, 1986; NASPAA, 1986). A NASPAA ad hoc committee on the subject also recommended integrating IT knowledge and skills into traditional courses in the PA curriculum.

NASPAA guidelines in 1997 proposed strategic information resource management (IRM), IRM planning methodologies, information policy, and IRM internships (Brown and Brudney, 1998). Kim and Layne (2001) proposed adding e-government issues to the current curriculum and creating an advanced e-government curriculum. Jennings (2002) insisted that e-government be integrated into courses throughout the PA curriculum, depending on specific settings. More recently, Dawes (2004) has suggested that five IT competencies are needed for successful public managers: strategic thinking and evaluation, systems-oriented analytical skills, information stewardship, technology concepts, and complex project management.

These scholars uniformly recommend that special attention be given to the organizational, political, social, and cultural aspects of IT rather than strict attention to the technical ones. Such an integrated socio-technical view, despite variations in emphases, has come to dominate IT education in PA programs (see Bostrom and Heinen, 1977, Kraemer, Dutton, and Northrop, 1981; Bozeman and Bretschneider, 1986; Norris, 2003). Although two decades old, NASPAA's 1986 guidelines were far-reaching in drawing a comprehensive picture of IT education that is consistent with extant sociotechnical perspectives and thus still valid as a whole. The fundamental questions relating to IT and public affairs education remain essentially unchanged, although specific skill sets and applications and pending issues have varied across countries over time (Pavlichev, 2004).

DATA AND METHODS

This paper principally examines undergraduate-level IT education in the PA programs of South Korean universities,⁵ because Korean PA education has focused more on undergraduate than graduate programs. PA programs in two-year colleges and police administration departments were excluded from the

analysis. We investigated IT course offerings, IT faculty members, and the establishment of PA programs. IT faculty members here are defined as those who majored in IT-related fields (e.g., PMIS and GIS) or who explicitly identified their specialties in the IT field. We classified IT instructors by looking at their curriculum vitae, publications, and reputation.⁶

We first examined the existing literature to trace historical changes in PA programs, with a focus on IT curriculum and instructors. The literature includes several articles published in *Korean Public Administration Review* (KPAR), the PA program list produced at Korea University, and a germane brochure issued by the Korean Association of Public Administration (KAPA) in 1997.⁷ Our Web research utilized search engines (Simmani, Google, Yahoo, Lycos, and Naver) to identify 105 PA programs from a total of 215 universities as of December 2002. The list is comprehensive insofar as all of these universities have Web-available information of interest to our research; findings from the Web research were consistent with the existing literature.⁸ Finally, we corresponded with instructors in Korea to confirm recent trends in e-government and information policy subjects.

We have grouped IT subjects offered in Korean PA programs into four categories based on course titles. Specific titles might vary slightly across programs, and specific topics addressed under the same title may differ depending on programs and instructors. These four groups are labeled as electronic data processing systems (EDPS), public management information systems (PMIS), information policy, and electronic government (e-government).⁹ No PA program offered or required subjects such as systems analysis and design, database management systems (DBMS), geographic information systems (GIS), or computer programming (e.g., C and Java), even though these topics might be sporadically touched upon in the four categories. We have excluded highly IT-integrated subjects such as data analysis (statistics) and management science (operations research). Table 1 illustrates how the Korean IT courses we have classified correspond to American courses.

Table 1. Comparison of Korean and American IT Courses

Korean IT Courses (2002)	American IT Courses
- Electronic data processing systems (EDPS)	- Introduction to computing (NASPAA, 1986)
- Public management information systems (PMIS)	- Computer applications for public managers (NASPAA, 1986)
- Information policy	- Management of computers and information systems (NASPAA, 1986)
- Electronic government	- Organizational and social impacts (NASPAA, 1986); Information policy (Brown and Brudney, 1998)
	- Electronic government (Kim and Layne, 2001)

IT courses and instructors were analyzed according to geographic regions and types of institutions (private versus public). Provinces and cities were geographically grouped into six regions: Seoul Metropolitan, Gyeonggi (Incheon), Gyeongsang, Jeolla, Chungcheong, and Gangwon (Jeju) provinces. Note that the population and economy are largely concentrated in Seoul Metropolitan and Gyeonggi (Incheon).

FINDINGS

As of 2002, there were 105 PA programs in 97 universities, including local campuses.¹⁰ Eighty-six percent of PA programs (N=84) offered at least one IT course, and about 52 percent (N=44) of them were located in Seoul Metropolitan and the Gyeongsang province (Table 2). The 78 private PA programs, accounting for 74 percent of the total, outnumbered 27 public programs.

Table 2. PA Programs by Region (2002)

PA programs	Gangwon (Jeju)	Gyeongsang	Seoul	Gyeonggi (Incheon)	Jeolla	Chungcheong	Total*
Total PA programs	8	26	25	14	14	18	105 (78)
PA programs with IT courses	5	22	22	12	11	12	84 (61)

* Numbers in parentheses indicate the number of private PA programs.

Table 3. IT Courses in 98 PA Programs by Region (2002)

IT Subjects	Gangwon (Jeju)	Gyeongsang	Seoul	Gyeonggi (Incheon)	Jeolla	Chungcheong	Total*	%
EDPS	1	2	3	2	3	3	14 (9)	10.4
PMIS	5	22	19	12	11	11	80 (57)	59.7
Info. Policy	1	10	11	1	2	1	26 (20)	19.4
E-GOV	2	3	4	3	—	2	14 (11)	10.4
Total	9	37	37	18	16	17	134(97)	100.0

Note: Excluded were seven PA programs whose curricula were not available on the Web.

*Numbers in parentheses indicate the number of IT courses offered in private PA programs.

PMIS Dominates IT Education

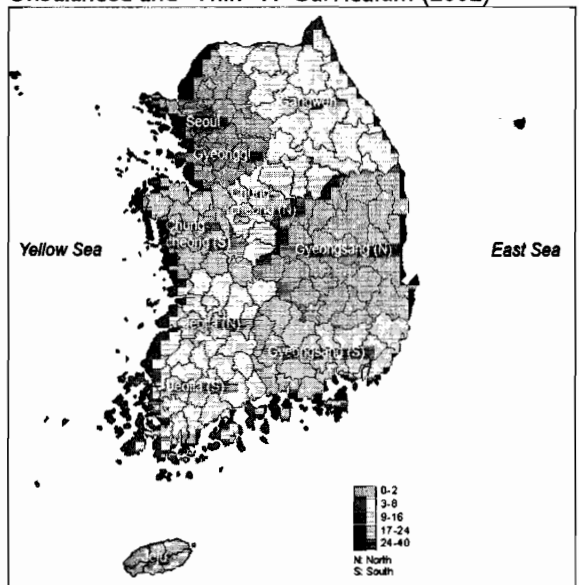
PMIS, first offered by Moon Suk Ahn at Korea University in 1982, has been widely adopted and recognized as a core subject in Korean PA programs. It accounted for 60 percent (N=80) of a total of 134 IT courses (Table 3). Seventy-six percent (N=74) of PA programs, or three out of four, offered at least one PMIS. Ninety percent (N=76) of the PA programs that offered at least one IT course had a PMIS or EDPS.

Seoul Metropolitan and Gyeongsang province held 55 percent (N=74) of the total IT courses, indicating significant regional differences (Figure 1). Unlike other subjects, PMIS was widely and proportionally distributed across the country. Private PA programs accounted for 72 percent (N=97) of all the IT courses, offering an average of 1.33 IT courses, slightly less than 1.48 of the public counterpart.

Tables 3 and 4 suggest that the IT curricula of PA programs lack topical balance and are “thin” in their number of IT course offerings. Most IT courses (70 percent) were EDPS and PMIS, whose components might overlap to some extent. The remaining 30 percent (N=40) were e-government and various information policy courses. However, it was not until the late 1990s that PA programs began to teach these new IT subjects. Furthermore, 70 percent (N=28) of e-government and information policy courses have been offered in Seoul Metropolitan and Gyeongsang province. As mentioned earlier, no PA program has offered systems analysis and design, DBMS, or GIS, as some American MPA programs have.

Seventy-seven percent (N=75) of 98 PA programs have had one or two IT courses, whereas only 9 percent (N=9) have offered three or more IT courses (Table 4).¹¹ Among the nine programs with a rich IT curriculum, seven are located in Seoul Metropolitan and Gyeongsang province; only one was public, and four did not have any full-time IT instructor. These observations consistently reveal an unbalanced and sparse Korean IT education that, we contend, is closely related to the lack of IT instructors.

Figure 1. Regional Distribution of 134 IT Courses: Unbalanced and “Thin” IT Curriculum (2002)



Lack of IT Faculty Members

There were a total of 652 faculty members, an average of 6.21, in the 105 PA programs in 2002 (Table 5). We identi-

fied 30 full-time IT instructors in the 105 PA programs, an average of .29 per program, accounting for 4.6 percent of total instructors.¹² These IT instructors were, however, in charge of 134 IT courses, with an average of 4.47 courses per instructor. Seoul Metropolitan alone accounted for 37 percent (N=11) of IT instructors. There was no significant difference in the number of IT instructors between the private and public PA programs.

In 2002, Seoul Metropolitan and Gyeonggi (Incheon), on average, had fewer than four IT courses per IT instructor, whereas Jeolla and Chungcheong provinces had more than eight courses per instructor (Table 5). It seems inevitable that most PA programs without sufficient IT instructors have had to rely on part-time IT instructors and concentrate mainly on PMIS. Also, these PA programs were less likely to develop various IT subjects and to offer all IT courses on a regular basis.

Table 4. PA Programs According to the Number of IT Courses (2002)

# of IT courses	Gangwon (Jeju)	Gyeong-sang	Seoul	Gyeonggi (Incheon)	Jeolla	Chung-cheong	Total*	%
None	3	3	3	1	1	3	14 (12)	14.3
1	1	13	11	7	6	8	46 (36)	46.9
2	4	6	7	4	5	3	29 (17)	30.0
3	—	3	4	1	—	1	9 (8)	9.2
Total	8	25	25	13	12	15	98 (73)	100.0

Note: Excluded were seven PA programs whose curricula were not available on the Web.

*Numbers in parentheses indicate the number of private PA programs.

Table 5. Full-time IT Instructors by Region (2002)

Full-time faculty	Gangwon (Jeju)	Gyeong-sang	Seoul	Gyeonggi (Incheon)	Jeolla	Chung-cheong	Total
Full-time faculty	51	155	189	75	79	103	652
Faculty per program	6.38	5.96	7.56	5.36	5.64	5.72	6.21
IT faculty members	3	6	11	6	2	2	30
IT faculty per program	.38	.23	.44	.43	.14	.11	.29
IT courses/IT faculty	3.00	6.17	3.36	3.00	8.00	8.50	4.47

Summary

IT education in Korean PA programs grew rapidly as a core component in the PA curriculum during the 1990s. Included as a required subject in the CSEG5, PMIS has swept through IT education in PA programs. Since the late 1990s, IT course offerings such as e-government and information policy have grown quickly in number. However, the IT curriculum has focused on a narrow range of IT topics—in particular PMIS—that were closely related to the CSEG5. Most PA programs offer one or two IT courses, resulting in a “thin” IT education, as previously suggested. In addition, the number of IT instructors has increased very slowly compared to the growth of IT courses.

How can we explain this peculiar diffusion of the Korean IT education? What were its driving forces?

WHAT DROVE THE DIFFUSION OF IT EDUCATION?

Three forces have directly and indirectly contributed to the diffusion of IT education in Korean PA programs: the National Information Infrastructure Projects, the Civil Service Examination for Grade Five, and the new College Entrance Policy.

National Information Infrastructure Projects (NIIPs)

Beginning in the late 1970s, the Korean government implemented a series of National Information Infrastructure Projects (NIIPs): the Administration Computerizing Project (1978-1986), the National Information Infrastructure Project (1987-1996), the Information Superhighway Infrastructure Project (1995-2000), and the Administration Informatizing Project (1996-2006) (MIC, 2003; Kim and Choi, 2001). During the past two decades, these NIIPs not only have dramatically improved wire/wireless telecommunications and Internet infrastructure, but also have developed the Korean IT industry enormously.

Telephone subscribers increased from four million in 1982 to 15 million in 1992 and to 33 million in 2002, an annual growth rate of 11 percent (MIC, 1991, 1993, 2003) (Table 6). Wireless telecommunication subscribers increased explosively from three million in 1996 to 33 million in 2002, an annual growth rate of 48 percent. Since the late 1980s, PC communication users have also continuously increased in number along with the private bulletin board system (BBS) boom that broadened the pool of Internet users long before the World Wide Web (www) became popular. PC penetration increased annually by 24 percent to reach approximately 50 percent in 2002. In addition, there were about 21,200 “PC Bangs” (or Internet cafés) that allowed citizens to enjoy Web surfing and PC games (<http://kosis.nso.go.kr/>).

Kim Dae-Jung’s administration (1998-2002) launched a strong initiative for Internet-based public services, and the Presidential Special Committee of Electronic Government opened the Korean e-government portal (<http://>

//www.egov.go.kr) in 2002. A series of IT-related laws have been enacted since 1996.¹³ The Korean government also invested more than nine billion dollars between 1998 and 2002 for nationwide informatization (MIC, 2003). The completion of the information superhighway infrastructure in 1998 persuaded the citizenry to access the high-speed Internet at offices as well as at home. Internet users were estimated to be one million in 1996 and 26 million in 2002, an annual growth rate of 82 percent (Table 6). In particular, the number of broadband Internet subscribers exploded from 14,000 in 1998 to 10 million in 2002, marking a skyrocketing annual growth rate of 422 percent. In 2002, Korea ranked third in terms of the number of Internet users per 1,000 people among the Organisation for Economic Co-operation and Development (OECD) countries (NCA, 2003). About half of the total population was wired to the Internet.

Wire/wireless telephones and the Internet have become indispensable to Korean life. Being familiar with IT and its applications has enriched the sense of belonging to Korean society. This knowledge has created a common language group to which citizens belong (Lee, 2003). This unique Korean culture expedited the wide and rapid spread of telecommunications and the Internet during the 1990s. As a result, citizens generally recognized the key role of IT and its applications in the information era. Public managers, PA scholars, and students have also turned their attention to the Internet and e-government. Knowledge and skills in IT have become essential for careers in government.

Table 6. IT Indices of Korean Information Infrastructure, 1996-2002 (Thousand)

<i>IT Indices</i>	1996	1997	1998	1999	2000	2001	2002	Growth (%)
Telephone subscribers	19,691	20,959	20,725	22,861	24,355	32,147	32,975	9.0
Wireless subscribers ^a	3,131	6,910	13,982	23,443	27,541	29,046	32,524	47.7
PC comm. users	1,568	3,131	4,870	8,803	16,807	17,101	16,453	48.0
PC penetration	6,304	6,931	8,270	11,530	18,620	21,500	22,490	23.6
Internet users	731	1,634	3,103	10,860	19,040	24,380	26,270	81.7
Broadband Internet ^b	—	—	14	365	3,870	7,806	10,405	422.1

Source: MIC, 2003; NCA, 2003.

^aCellular + PCS + IMT-2000 subscribers; ^bDSL + Cable modem + LAN + Satellite subscribers

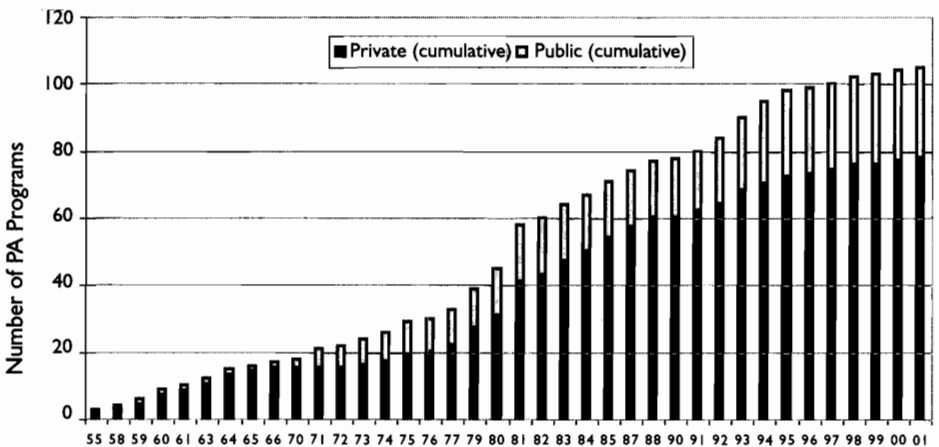
In sum, the NIIPs have boosted IT industry and changed perceptions and attitudes concerning IT and its applications. Citizens have come to realize that IT literacy has become a core competency in a new environment in which Internet-connected computers are highly accessible across the country. Government has had an increasing need for IT-knowledgeable public managers, and PA students have wanted to acquire the necessary knowledge and skills in PA programs. Consequently, PA programs have had to provide IT education and training to meet this new demand. The NIIPs also have provided PA scholars with financial incentives and opportunities, motivating them to become involved in IT research and the development of IT courses. In this congenial climate for IT, PMIS has become a required subject of the open competitive civil service examination.

Civil Service Examination for Grade Five (CSEG5)

Another important driving force for IT courses has been the Civil Service Examination for Grade Five (CSEG5), which has been very attractive to students who want to be public managers in powerful positions. Because of substantial benefits for successful examinees, the CSEG5 has been extremely competitive. Most students have chosen PA programs largely because they believe that the programs can provide efficient ways to prepare for the CSEG5. In other words, the CSEG5 has affected students' decisions to select certain departments and universities over others. Thus, universities have had strong incentives to establish PA programs capable of recruiting many students. It is notable that 20 percent (N=21) of a total of 105 PA programs were established between 1990 and 1995, when PMIS remained a requirement in the CSEG5 (Figure 2).

Which particular subjects are included in the CSEG5 has had a substantial impact on the PA curriculum. Major PA courses correspond precisely to subjects of

Figure 2. Growth in the Establishment of Korean PA Programs



Source: Yoon (1987), Lee, Jung, and Kim (1990), and Web research.

the CSEG5.¹⁴ Until the mid-1990s, PA programs had rushed to offer PMIS or its equivalent, because PMIS had become a required subject in the first round examination of the CSEG5 in 1988.¹⁵ A corresponding push, particularly for e-government and information policy, occurred in the late 1990s when the government was considering one IT subject for the CSEG5. As a consequence, there was a substantial increase in average number of IT courses in the four years since 1998.¹⁶ There were 51 IT courses in the 68 PA programs surveyed in 1998, an average of .75 per program (Kim, 1998). By 2002, 98 PA programs offered 134 IT courses, an average of 1.37. Universities and PA programs could benefit from offering IT courses that attracted many CSEG5 examinees who would otherwise choose other universities or find private tutoring institutes.

In brief, inclusion of PMIS in the CSEG5 not only accelerated the establishment of PA programs, but it also drove PA programs to add IT courses to their curricula. Although PMIS became an optional subject in the second round examination of the CSEG5 in 1996, it continued to create a bandwagon effect in IT education. As Ahn (1991) concluded, the diffusion of IT courses in Korean PA programs, particularly PMIS, was directly stimulated by the CSEG5.

New College Entrance Policy

The new College Entrance Policy (CEP) that became effective in 1999 also prompted and facilitated the development of new IT courses, specifically e-government and various information policy subjects. The CEP allows students to select their departmental major at the end of their sophomore year. This new policy has created competition for survival among such departments as political science, economics, and sociology (Kim, 1998). If a department failed to recruit a sufficient number of students, it could lose its student quota or even be closed down. Consequently, PA departments faced an urgent need to make their programs more attractive, in order to maintain their student enrollments.

A couple of observations indicate the impact of the new CEP. First, the number of IT courses per program approximately doubled within four years, jumping from .75 in 1998 to 1.37 in 2002 (Kim, 1998). Second, most e-government and information policy courses (78 percent) were offered in private PA programs, whose flexibility made it relatively easy to add new IT subjects quickly. Finally, PA programs, promoted by the e-government project, strategically developed e-government courses, hoping that the subject would soon become a new requirement of the CSEG5. E-government and information policy seemed quite appealing to students who would pursue future government jobs.

Kim and Choi's (2001) analysis of IT-related articles indirectly, but dramatically, illustrates how the NIIPs, the CSEG5, and the CEP affected the diffusion of IT education. The fluctuation in the number of IT-related articles published

in *Korean Public Administration Review* (KPAR) and *Korean Policy Studies Review* (KPSR) corresponds by and large to the just-recounted series of germane events that occurred during the 1990s. Interestingly, more articles were published in the early and late 1990s, with fewer articles in the middle (Table 7). This finding contrasts markedly with IT-related articles in *Public Administration Review* (PAR) during the same period that show no apparent correlative pattern.

DISCUSSION

This section discusses the academic institutional isomorphism between the adoption IT courses in Korean PA programs and the unfolding of challenging issues of IT education as characterized in the preceding analysis.

Academic Institutional Isomorphism

Largely due to the NIIPs and the CSEG5, citizens and students take it for granted that PA programs will provide apt IT education and training. IT education has become a so-called institutional rule that people consider proper, adequate, and necessary in PA programs (Meyer and Rowan, 1977). PA programs in effect had to abide by this rule in order to maintain legitimacy for survival. The leading scholars in Seoul Metropolitan, with its superior education resources, established an “implicit standard” for instructional materials and components of IT courses. This standard became a source of good practice for followers or late-adopters who were confronted with uncertainty in IT education. Most PA programs without sufficient resources and IT faculty have tended to model what leading scholars have been doing. It is not surprising, for instance, that the pioneering PMIS textbook written by Ahn (1989) has been widely used in PA programs. This diffusion of IT education can thus be viewed as an institutional isomorphism based on a mimetic process (DiMaggio and Powell, 1983).

However, there appears to have been less concern with the availability of IT instructors and the quality of IT education. Universities and PA programs appear to have focused more on advertising their IT courses offerings rather than on the quality of their IT education. What PA programs have needed most is to convince students of their merits in helping them prepare for the CSEG5.

Table 7. IT-Related Articles Published in the Major PA Journals

Journal	90	91	92	93	94	95	96	97	98	99	00	Total
KPAR	11	5	1	3	2		2	1	4	3	6	39
KPSR*	-	-	-	1	1		1	4	9	2	4	22
Total	11	5	1	4	3		3	5	13	5	10	61
PAR	3	1	1	1	2	2	2		2			14

Source: Adapted from Kim and Choi (2001) and Northrop (1999)

*Korean Association of Policy Studies (KAPS) published the first issue of KPSR in 1993.

In this vein, recently added IT subjects such as e-government and information policy courses have seemed exercises in academic and marketing rhetoric. It is likely that these IT subjects, despite various titles, have fundamentally addressed the same topics, have been taught by the same instructors, and/or have not been offered regularly. The gap between the published IT curriculum and actual IT education has come from isomorphism with legitimated institutional rules, rather than stemming from the real availability of IT instructors and quality IT education. Nonetheless, PMIS and other IT courses have generally enriched the PA curriculum and satisfied students and PA programs.

Double-edged CSEG5

The CSEG5 has substantially influenced the diffusion of IT courses, in particular PMIS until the mid-1990s and e-government since the late 1990s. Ironically, however, the greatest barrier to minimizing the gap between aspiration and reality in IT education has also been the CSEG5. The PMIS section of the CSEG5 has tested examinees' conceptual understandings of IT but rarely their practical abilities in using IT applications. In order to prepare for the "memory-testing" examination, examinees need only to practice multiple choice questions about IT jargon without knowing what the terms actually mean.¹⁷

As such, PA programs have not had a strong incentive to emphasize practical aspects of IT education. Most IT courses have focused on conceptual aspects likely to appear on the examination. The technical and practical subjects such as systems analysis and design, DBMS, and GIS have rarely been offered in Korean PA programs. By the same token, students have been unwilling to take these courses and have not taken them—even if offered—because such skills and practical knowledge are not necessarily helpful for the CSEG5. On the one hand, the CSEG5 has played a key role in diffusing IT education, but, on the other hand, it has prevented PA programs from balancing conceptual and practical IT education. In short, the CSEG5 has been a double-edged sword for IT education in Korean PA programs.

A Bias Toward PMIS

IT courses have become popular in PA programs since the late 1980s. However, IT education has been limited to some subjects closely related to the CSEG5. Despite e-government and information policy emerging since the late 1990s, PMIS has dominated IT education in PA programs so far. PA programs have seemed to be more interested in adding PMIS coursework or its equivalent, regardless of how appropriately these subjects are taught. This bias toward PMIS has been closely related to the dependence on the CSEG5, lack of IT instructors, and lesser willingness to collaborate with other disciplines.

First, the PA curriculum has been influenced by the CSEG5 and, accordingly, IT education has centered on PMIS that was tested in the CSEG5. Most IT

courses have relied on only one or two textbooks written by the leading scholars in Seoul Metropolitan, who have frequently served as examiners of PMIS in the CSEG5. This dominance of PMIS has produced an unbalanced and sparse IT education.

Second, the number of IT instructors is insufficient. This problem, of course, is not unique to Korea, but it is common to some extent in other countries (Kiel, 1986). As we noted earlier, in 2002, a total of 30 IT faculty members were in charge of 134 IT courses, an average of 4.47. This lack of full-time and part-time IT instructors inhibited PA programs from offering various IT courses. Furthermore, more than half of the IT faculty members taught in Seoul Metropolitan and Gyeonggi (Incheon). As a result, most PA programs, particularly in local regions, had no choice but to depend on part-time instructors and/or not to offer IT courses regularly.

Finally, PA programs, despite their interdisciplinary nature, appear not to collaborate actively with other disciplines such as information science, computer science, and telecommunications. Business schools, for instance, have aggressively adopted subjects from other disciplines to develop the management information systems (or MIS) concentration that includes various IT courses such as telecommunications, DBMS, and computer programming in its curriculum. In contrast, the PA program has taken a relatively passive attitude toward adopting and developing IT courses. Disciplines have, at least to some extent, a tendency for their scholars to lock themselves into their own discipline, making collaboration more unlikely. This tendency, of course, varies across disciplines and countries.¹⁸ Like business schools, PA programs need to collaborate actively with other disciplines. This interdisciplinary collaboration would facilitate empirical research on the organizational impacts and management implications of IT, which is indispensable for developing applicable theories and methods.

Conclusion

Information technology education in Korean PA programs has grown dramatically since the early 1980s, making public management information systems (PMIS) one of the core subjects in the PA curriculum. PA programs developed e-government and various information policy subjects during the late 1990s. However, IT courses and instructors have been unequally distributed across regions and concentrated in Seoul Metropolitan. We found no statistically significant difference in the number of IT courses and instructors between private and public programs. The PA program has suffered from a bias toward PMIS, unbalanced and thin IT education, and a lack of IT instructors.

Three major driving forces have contributed to the rapid and country-wide diffusion of IT education in Korean PA programs. First, a series of National Information Infrastructure Projects (NIIPs) have provided PA scholars with strong financial incentives, attracting them to IT research and education. The projects

have also changed perceptions about IT and telecommunications, making IT education in PA programs a feature of public affairs education that is taken for granted. Second, the Civil Service Examination for Grade Five (CSEG5) decisively affected the diffusion of IT education by including PMIS as a required subject in the first round examination. Third, the new College Entrance Policy (CEP), because it boosted competition among academic departments and disciplines, forced PA programs to make their curricula more appealing to students.

These three factors have transformed the external environments of Korean PA programs and thus contributed to the diffusion of IT education. In order to survive in a transformed institutional and social context, PA programs have had to adapt their curricula. In the meantime, the leading PA programs and IT scholars, particularly in Seoul Metropolitan, have provided an exemplary model (particularly in regard to curriculum and textbooks) that followers could imitate in order to obtain institutional legitimacy.

We concur with Brown and Brudney (1998), who concluded that PA programs must broaden IT course offerings. In response to developments such as digital convergence and interactive communication, IT courses need to introduce such emerging technologies as wire/wireless telecommunications and GIS. E-government, for example, may not be productive without a basic appreciation of systems analysis and design, telecommunication, and GIS.¹⁹ IT education also needs to maintain a balance between the technical aspects of IT and its managerial, political, and social dimensions. Given resource limitations, however, it seems inevitable for the time being that PA programs will depend on other departments, such as ones in business administration, for some IT courses; greater interdisciplinary collaboration rather than simply expedient reliance on other disciplines would better serve IT and PA education.

More effort needs to be devoted to enhancing theoretical and methodological rigor in IT research.²⁰ In particular, Korean IT education should be more practical so that students are able to acquire specific skills and knowledge along with a solid understanding of the wider implications of IT and its applications. For practical learning, internships in government or the nonprofit sector have been frequently recommended (Lee, Jung, and Kim, 1990; Kim, 1998; Brown and Brudney, 1998; Dawes, 2004). Of course, more qualified IT instructors should be recruited to develop diverse IT courses and enhance the quality of IT education.

Finally, it is important to understand that the most crucial element of the PA curriculum is the civil service recruitment system. The formats and individual subjects of the CSEG5 should be improved so that examinees' practical IT knowledge can be properly tested (Lee, Jung, and Kim, 1990). In this regard, open-position recruitment needs to be expanded in order to hire competent public managers and specialists from universities and the private sector.

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NOTES

1. This paper prefers information technology (IT) to information and communication technology (ICT). As technologies converge, many PA scholars, in an attempt to emphasize interactivity and two-way (tele)communication technologies, seem to be more comfortable with ICT rather than IT (Bellamy and Taylor, 1998). We examine, however, historical changes in general IT education without any predilection for communication issues. It should be noted, however, that the concept of stagewise innovation-diffusion on which this paper relies was pioneered by Everett M. Rogers in the context of communications theory.
2. Not all IT courses were officially required, but most PA students took IT courses, in particular PMIS, at least for their career. Thus, PMIS was virtually required in Korean PA programs.
3. Forty-five percent of the highest ranked 20 MPA programs had e-government or IT concentration and 50 percent referred PA students to other departments for taking IT courses (Pavlichev, 2004).
4. About half of the survey respondents preferred the integration of IT courses into the existing curriculum and did not believe that IT courses should become a requirement for MPA students (Kiel, 1986). Fifty-seven percent of PA programs in 1989, 70 percent in 1995, and 79 percent in 1998 integrated computer knowledge and skills into such courses as data analysis, management science, and financial management (Brudney, Hy, and Waugh, 1993; Waugh et al., 1995; Brown and Brudney, 1998).
5. The exception is the Graduate School of Public Administration at Seoul National University, which does not have an undergraduate program.
6. Some PA programs did not provide faculty curriculum vitas and publications. Thus, the number of IT faculty members here is considered a conservative measure.

7. See <http://www.korea.ac.kr/~igskorea/office/departement.html> (Accessed March 1, 2003).
8. However, seven PA programs either did not have workable Web sites or did not provide their course offerings through the Internet; so, they were excluded in analyzing IT courses. The exclusion does not seem to affect the analysis substantially, because they were not known as outliers in terms of education resources.
9. We classify information processing, administration and computer, and practice in information management/computing as EDPS. PMIS includes MIS and government information systems. Information policy includes telecommunication policy, internet and telecommunication, and knowledge management in information society. PA programs use almost the same course title for e-government. Despite this grouping, there must be a blurring of boundaries, especially between PMIS and information policy/e-government.
10. Six programs were established at local campuses, and two universities have two PA programs with different names. These programs were treated as an independent department for the purpose of analysis.
11. In 1995, 18 percent of American MPA programs offered only one IT course, while 38 percent had two courses and another 38 percent offered three courses (Waugh et al., 1995).
12. Waugh et al. (1995) reported, in contrast, that three out of four American MPA programs had IT faculty members. Eighty percent responded "not difficult at all" to recruit faculty with an IT specialty, while only one percent answered "very difficult."
13. Examples include the Information Facilitation Basic Law of 1996, the Digital Signature Law of 1999, the Electronic Transaction Law of 1999, the Knowledge Information Resource Management Law of 2000, and the Electronic Government Act of 2001.
14. Kim (1998) reported that the 68 PA programs offered on average 2.74 law subjects, 2.26 local administration, 2.06 principles of public administration, and 1.99 policy studies. Constitutional law and administrative law were required in the CSEG5, while the remaining three subjects were optional. IT course (PMIS) ranked 14th with an average of .75.
15. Yoon (1987) placed EDPS/PMIS at the bottom of the list of subjects that less than 25 percent of PA programs offered in 1986. Lee, Jung, and Kim (1990) reported that eight PA programs have EDPS/PMIS; that is, 35 percent of the 23 programs surveyed in 1989. Kim (1998) found that 68 PA programs offer an average of .75 IT courses. We estimated that about 68 percent of PA programs offered IT courses, assuming 1.1 courses per program with IT courses.
16. Because many PA programs at that time offered EDPS/PMIS, the increase since the late 1990s seemed largely due to e-government and various information policy subjects.
17. Some questions on the first PMIS exam, for instance, asked about IT terminologies such as MODEM (Modulator-demodulator) and fourth-generation computer languages.
18. For instance, about 87 percent (72/83) of the articles published in KPAR in 2004 were written by PA scholars, while only 45 percent (27/60) were in PAR. Non-PA scholars including practitioners accounted for 6 percent (N=5) in KPAR and 32 percent (N=19) in PAR. Collaboration of PA and Non-PA scholars held 7 percent (N=6) and 23 percent (N=14), respectively.
19. E-government courses offered in the 20 MPA programs covered a small portion of the technical aspects: data mining and DB management (6 percent), GIS (6 percent), and others (7 percent) (Pavlichev, 2004).
20. Despite the positive effects on IT research and education in PA programs, NIIPs also had an adverse effect in that research became project- rather than theory-oriented, with an emphasis on supporting national projects (Kim and Choi, 2001).

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