

A LONGITUDINAL ASSESSMENT OF TRENDS TOWARD INTERNATIONALIZATION OF THE INFORMATION SYSTEMS CURRICULUM

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This research provides empirical results of a longitudinal study designed to evaluate trends toward internationalization of the information systems (IS) curriculum. Results reported in this study reflect changes over a five year period. There is evidence to suggest that significant curriculum development contributions have been made during this time span in the international IS domain. A proliferation of literature that addresses the international dimension of the IS field has developed over a relatively short period of time. The evidence also indicates that considerable effort has been devoted to including an international dimension in the introductory information systems course. This study provides the first comparison of international IS curriculum trends over time and in the context of broader international business educational reform. This work provides IS educators with a base from which to evaluate the best approach for internationalizing the IS curriculum and a benchmark from which to proceed.

INTRODUCTION

The 1990s will be recognized by IS academicians as a time of evolutionary change in the field. The early part of the period has been marked by debates concerning the future of the field as a discipline and its role in the overall business curriculum. From a research perspective, the debates have centered around the relevance of reported research for the business community. The rapid change in technological advancements and the role of the internet, for example, have changed the dynamics of curriculum reform across all disciplines. Some argue that the IS department or concentration no longer owns the core curriculum. It is their contention that information technology has become pervasive across all functions and processes and is more appropriately integrated throughout the business curriculum. Others argue that a unique core exists as well as a dimension that can be expanded to the business functions and/or processes. This debate will likely continue for some time.

One of the significant enhancements evidenced over the past five years in both the research literature and curriculum design has been the effort to incorporate the international dimension into the existing IS curriculum. Before 1990, the IS research literature was, for the most part, void of an international dimension. A few fragmented studies existed but a defined stream of research building on previous empirical work was not available. Likewise, the traditional IS curriculum was being taught from a domestic (US) perspective with little or no emphasis on the international issues and problems encountered by multinational firms. This observation was reflected in the available curriculum resources including texts, supplementary readings, and case studies targeted for the IS curriculum. Textbooks available for the introductory IS course prior to 1990 lacked an international orientation. In addition, curriculum guidelines established through the work of the Association for Computing Machinery (ACM), Data Processing Management Association (DPMA), the

International Federation for Information Processing (IFIP), and other recognized organizations were void of guidelines to include international content in the IS curriculum.

Since 1990, much activity has taken place that leads one to believe that these previous trends are changing. The first specialized courses in international IS were offered in 1992. Since that time several course models have been developed that focus on both undergraduate and graduate program needs (Deans, Loch and Roche, 1993). Many schools have followed the lead in implementing similar courses. Much attention has been devoted to this topic at annual IS conferences over the last few years (e.g., the Information Resource Management Association (IRMA) has taken a leading role in international IS issues in general and the International Academy for Information Management (IAIM) in international IS curriculum issues). Other leading IS organizations have, likewise, recognized the importance of the issues. Faculty seminars focusing on incorporating international dimensions into the IS curriculum have been taught in the prominent international business programs since 1990 (i.e., University of South Carolina and Thunderbird-The American Graduate School of International Management). Major enhancements in international content are included in recent textbooks targeted for the introductory information systems course. This trend is also reflected in recent resource materials, readings books, case studies, and related research (Daniels, 1993; Deans and Kane, 1992; Deans and Karwan, 1994; Deans and Jurison, 1996; Khosrowpour and Loch, 1993; Palvia, Palvia, and Roche, 1996; Palvia, Palvia, and Zigli, 1992; and Roche, 1992). Clearly, much activity is taking place in this domain. This study addresses the need to empirically evaluate the degree of influence and change in IS program content that may or may not have taken place as a result of enhanced interest and activity in this area over the past few years.

The IS curriculum will continue to undergo change if it is to keep pace with technological advancement. Information technology is the driver of global business activity. Globalization trends and communication networks that make the world smaller and information access easier is the result of information technology advancements. How all these changes will continue to impact the IS curriculum is yet to unfold.

INTERNATIONAL BUSINESS CURRICULUM TRENDS

The driving force behind this study is the increasing trend toward globalization of business and the response of business schools to provide a broader knowledge base with a stronger global orientation. There is clear evidence that business schools across the board are placing greater emphasis on development of global research and teaching agendas. To remain competitive, business schools have realized there is no choice but to move forward in the international domain. In order to play a leadership role in the future, business school curriculum must keep pace with the revolutions occurring in the business world around them.

The international models that have developed in business schools to date vary considerably. In many cases, internationalization efforts that have developed over the years are typically either ad hoc efforts that reflect limited resources, a push from a strong administrator, or are based on the interest and incentives of individual faculty members. There are few examples of a fully integrated global business curriculum. A global orientation is difficult and requires a well developed strategic plan, support by top administration, the necessary resources, and business alliances.

Business schools that have taken the internationalization issue seriously typically tend to add international courses in each of the functional areas. In a large number of these cases, traditional functional courses exist along with the specialized international course. The information systems discipline has been one of the last areas in most business programs to incorporate an international course or even to add international dimensions to the core IS curriculum. Evidence indicates that the internationalization efforts in the IS area have also taken place in an ad hoc manner. Individual faculty interest has typically been the catalyst for internationalizing IS curriculum in most programs. There is no evidence to indicate that the internationalization effort in the IS domain has been the result of a strategic plan endorsed by top management that fits the overall international plans for the business school curriculum.

Successful business schools of the future will be those that adapt to change and respond to an unpredictable environment. Tomorrow's schools of management will likely have little resemblance to the models of today. Technology is the catalyst driving these changes. Curriculum initiatives and learning environments must evolve in response to these overwhelming trends. The time has come to rethink the methodologies and conceptual foundations of the past. Business schools that leverage these opportunities and embrace the change will prosper in this new era.

INTERNATIONAL IS CURRICULUM STUDIES

There has been an increased interest in business school curriculum development in general over the past few years. The international dimension has emerged as one of the key drivers of curriculum reform. This is evidenced by the recent emphasis placed on international curriculum issues by relevant journals and professional organizations (e.g., special issue of *MIS Quarterly* (1995) and emphasis during the past year in *Decision Line* (1994 A, 1994B), the publication of the Decision Sciences Institute).

Several curriculum studies have emerged in recent years that address issues relevant to the information system domain. Farwell (1992) et. al. argue for a new paradigm for IS curriculum. The authors posit that fundamental changes taking place in the business world today will impact curriculum development over time. A new set of assumptions will provide the catalyst for curriculum reform. They further argue that the gap between what employers expect and need of IS graduates and what is covered in current IS programs must be narrowed. The international dimension is one of many of these dimensions. Laribee (1992) argues for closer communication between IS practitioners and IS academicians as we move forward with curriculum reform. This is particularly important from the perspective of globalizing the IS curriculum.

Studies that focus specifically on the international dimension of the IS curriculum have also emerged. Deans and Goslar (1993) performed the first study of IS programs and curriculum trends in non-U.S. schools of business. Prior to this work curriculum studies that focus on the undergraduate IS course (McLeod, 1985) or graduate course (1989) focused on programs from a strictly US business school perspective. A follow-up study by Goslar and Deans (1994) provided empirical results of IS curriculum comparisons between U.S. and

foreign business schools. This study provided insights not before available in the IS literature.

Specific papers describing development and implementation of individualized courses in international IS have also appeared in the recent literature (Deans, 1993; Deans and Goslar, 1993; Deans, Loch and Roche, 1993; Granger, Rollier, Schroeder, and Esnault, 1992). These papers present various strategies for implementing an international IS course in the business curriculum. They represent responses to different program characteristics and individual needs. Khosrowpour and Loch (1993) published a book dedicated to international IS curriculum issues that provides a broad base of current thought on the topic.

The need for this study evolved in response to these recent trends. No study to date has addressed the impact of various influences and business school curriculum trends on IS programs and course offerings over time.

METHODOLOGY

The methodology for this study followed the design of the first survey of US Schools of Business by Goslar and Deans (1994). In that study, all current members of the AACSB were surveyed. From that group of 403 US business schools, 122 useable completed surveys were returned, representing a response rate of 30%. The surveys were completed by the chairperson of the IS department for schools that had IS programs. Deans or the most appropriate and knowledgeable person were asked to respond for those institutions with no IS program. This study is a follow-up survey that provides a direct comparison of these schools' internationalization progress over a five year period.

Three research questions are the focus of this paper:

1. What are the major forces driving IS curriculum reform toward inclusion of an international dimension? How have these influences changed over time?
2. What strategies and teaching alternatives are being implemented to accomplish the objectives of internationalizing the IS curriculum? How have these changed over time?
3. What are the major trends toward a) development of separate international IS courses? b) placing importance on internationalizing the IS curriculum?

- c) future plans toward internationalization? How have these trends changed over time?

Questionnaire

The instrument was comprised of four sections, all of which were taken from the first survey. Respondents evaluated a list of twelve influences identified as drivers for international IS curriculum development on a scale of 1 to 7 (1 = not important and 7 = extremely important). This list is presented in the results section in Table 3. Similarly, a seven point scale (1 = very effective; 7 = very ineffective) was used to evaluate the effectiveness of international IS teaching alternatives (i.e., a separate international IS course, international topics integrated into the core IS curriculum, international topics integrated into only select IS courses). The third section included several questions designed to evaluate perceptions toward internationalization of IS curriculum that were evaluated on a seven point scale (1 = strongly agree and 7 = strongly disagree). An open-ended question intended to identify major themes and topics considered essential for internationalizing the IS curriculum was incorporated. Finally, a number of variables describing current IS program characteristics and future plans were included. Only three questions included in the second survey were not part of the first study.

Respondents and Data Analysis

The questionnaire was administered by mail and sent to the 112¹ respondents participating in the first survey. Responses from this sample provide a direct comparison of changes in perception, degree of interest, and implementation trends over time. Of the 112 institutions

surveyed, 66 questionnaires were returned representing a response rate of 59 percent. A profile of general characteristics of respondents from both studies is presented in Table 1. A discussion of these variables and their relationship to the study results is presented in the results and discussion section.

Data analysis is primarily descriptive. Frequency distributions and two-tailed t-tests are reported. These findings are general in nature, suggesting direction for more in-depth analytical work in future studies.

RESULTS AND DISCUSSION

The survey groups' descriptive characteristics varied little. There was a slight increase in the number of IS degree programs offered currently in the baccalaureate and doctoral levels. Interestingly, there was a slight decline in the number of masters' level programs offered. Respondents indicated that the number of IS undergraduate courses increased slightly while the number of graduate courses decreased. It is difficult to ascertain what this change indicates other than perhaps a shifting in size of programs and resource allocations. The number of faculty with international background and/or training is low. This comes as no surprise as this has been repeatedly reported as one explanation for the slow incorporation or actual resistance to include international topics in courses. The percent of internationalization of reported IS programs is sixteen percent. Our impression is that this percentage is quite low, especially for a group of institutions that we might consider leaders in internationalization. As these last two questions were not asked in the first survey, the responses provide a good baseline for future comparisons.

TABLE 1
GENERAL CHARACTERISTICS OF TWO SURVEY GROUPS

<u>Demographics</u>	<u>1st Survey</u> <u>(n=122)</u>	<u>2nd Survey</u> <u>(n=66)</u>
Offer an IS degree program in the following levels:		
Baccalaureate	75%	77%
Masters	30%	27%
Doctoral	16%	17%
How many IS courses are currently taught? (mean, std dev)		
Undergraduate	3.18 (1.76)	3.56 (4.63)
Graduate	2.42 (1.93)	1.33 (1.34)
Number of IS faculty (mean, std dev)	7.02 (5.70)	5.14 (3.6)
Number of faculty with international background and/or training (mean, std dev)	not asked	2.1 (2.8)
Percentage of IS program internationalized (mean)	not asked	16%

TABLE 2

COMPARISON OF SIGNIFICANT INTERNATIONAL IS TOPICS OVER TIME

<u>First Survey</u>	<u>Second Survey</u>
1. Worldwide telecommunications	1. International telecommunications
2. Transnational information flow	2. Transborder data flow
3. Global strategic use of IT	3. Global communications - Internet
4. Multilingual computing	4. Global enterprise networking
5. Integrated Services Digital Network (ISDN)	5. Electronic Data Interchange (EDI)
6. Global network development	6. ISO-9000
7. Global cultural and social implications of IT	7. Managing global information resources
8. Technology differences across countries	8. Global virtual organizations
9. Differences in IS management practices	9. International communication standards
10. International standard	10. Global outsourcing markets

MAJOR INTERNATIONAL IS TOPICS AND THEMES

In an open-ended question, respondents were asked to prioritize the five most important topics for the international IS curriculum. Based on our subjective judgment, Table 2 gives a listing in priority order of the top ten topics over time. The follow-up survey results showed a clearly enhanced understanding of the issues and possible topics. In the first survey, the responses came from only 20 of the respondents. The majority of the respondents in the first survey did not answer the question and we might conclude that this is indicative of a lack of knowledge about the topic at that time. In the second survey over half of the respondents (52%) answered this question. This suggests an increased level of awareness and interest in international IS. The responses were also more informed in content and more extensive in focus.

While the number of responses on the first survey were limited, constraining our ability to generalize, some simple observations might be made. Both groups listed international telecommunications and transborder information flows the most frequently. The first survey's respondents also appeared to be more technology focused (e.g. ISDN, network development, technology differences across countries) whereas the second survey's respondents evidenced much concern about issues of connectivity (e.g., global communications-internet, enterprise networking, EDI, global virtual organizations, and international communications standards).

From these responses, the following themes emerged as representative of the international IS domain. This list represents a starting point as we move toward consensus in defining the international IS component for curriculum design.

- Theme 1:** Global Connectivity and Telecommunications
- Theme 2:** Management of Global Information Flows
- Theme 3:** Planning and Strategic Implications of Global IT
- Theme 4:** Global Integration of Systems, Technology, Processes and People

When asked to indicate the importance of the reasons for internationalizing the IS curriculum, the results are consistent with the general topics and themes identified (see Tables 2 and 3). Notably, issues of *transnational information flows* and *global economic interdependence* were significantly more important the second time around. While statistically not significant but suggesting positive influence over the last five years on institutions towards internationalizing the curriculum, four reasons merit attention. Two reasons, *use of IT for international competitive advantage* and *expanded global telecommunications*, support results reported in Table 2 where they are mentioned directly or inferred as significant international IS topics over time. Two other responses, *industry demands* and *influence of academic governing bodies*, such as the AACSB, also showed an increasing positive influence towards internationalizing

TABLE 3

REASONS FOR INTERNATIONALIZING THE IS CURRICULUM

<u>Reason</u> 1 = not at all important 7 = extremely important	<u>1st Survey</u>		<u>2nd Survey</u>		<u>Sig.</u>
	<u>Mean</u>	<u>Std Dev</u>	<u>Mean</u>	<u>Std Dev</u>	
Growth in multinational corporations	5.48	1.41	5.50	1.23	
Global economic interdependence	5.40	1.63	5.75	1.15	.10
Transnational information flow	5.39	1.58	5.83	1.23	.04
Use of IT for international competitive advantage	5.50	1.47	5.70	1.31	*
Expanded global telecommunications	5.53	1.52	5.80	1.06	*
Hardware standardization	4.15	1.54	4.05	1.48	
Software standardization	4.14	1.51	4.15	1.51	
IS methods standardization	3.98	1.47	3.86	1.54	
Changes in international law	4.00	1.46	4.00	1.46	
Faculty with foreign experience and education	3.77	1.77	3.48	1.71	
Influence of academic governing bodies	3.56	1.62	3.66	1.58	*
Industry demands	4.56	1.70	4.95	1.57	*

*moving in a positive international direction

the curriculum over the past five years. *Industry demands* were clearly viewed as being more important than the dictums of the AACSB (4.95 vs. 3.66 respectively).

Reasons for internationalization which remained the same or decreased in importance over the past five years included *growth in multinational corporations, standardization of hardware, software, and methodologies, changes in international law, and faculty with foreign experience and education*. Only *growth in multinational corporations* was still considered to be above the midpoint (5.50) in importance.

STRATEGIES FOR INTERNATIONALIZING THE IS CURRICULUM

Respondents were asked to provide current syllabi for international IS courses and for courses that have been substantially internationalized. Selected interviews were also conducted for clarification and additional input.

Several approaches for international IS curriculum development were identified. The majority of schools in our study have made substantial progress toward including an international dimension in the core IS course. Depending on the characteristics of the IS program, resource availability, and support from key leaders, a number of these schools have progressed further in their efforts by offering a separate international IS course or by incorporating international content into additional courses in the IS curriculum.

Eight strategies for internationalizing the IS curriculum were identified in this study. The three most common were:

Strategy 1: International topics incorporated only in select IS courses, most frequently the introductory IS course.

Strategy 2: International topics integrated into all of the core IS course offerings.

Strategy 3: A separate international information systems full credit course that focuses on the unique issues relevant to operating internationally. This is usually an elective course and may be designed for IS majors.

Other strategies that received mentioned include:

Strategy 4: A reduced credit course focusing on international information systems and technology issues that complement other IS course offerings.

Strategy 5: A credit module that is taught outside the United States, such as an intensive study abroad course.

Strategy 6: Individualized opportunities such as internships and self study research modules for credit.

Strategy 7: Doctoral seminar as one component of the IS internationalization plan. This alternative is only appropriate for those that have doctoral programs and recognize the international domain as a viable research stream.

Strategy 8: Any combination of the above strategies that meet the needs of the IS program.

Any of these strategies can be complemented with guest speakers, case studies, individual student projects, and other innovative ways to include international issues and topics. These strategies are not mutually exclusive and may be developed in conjunction with other schools or businesses. The opportunities are immense and many of the respondents in this study are internationalizing their IS programs in innovative ways.

IEWS ON TEACHING STRATEGIES

The respondents were asked to evaluate the effectiveness of the three most common alternatives on a Likert-like scale at the graduate and undergraduate levels (1=very effective; 7 = very ineffective). There was general agreement among the two groups that incorporation of international topics into select IS courses is less appealing than integration throughout the core IS curriculum, yet viewed as more effective than a separate international IS course (see Table 4). The trend however, is that strategies one and two, at the graduate level, are seen as becoming less effective. In contrast, the integration of international IS topics into the core IS course offerings at the undergraduate level is considered to be more effective although not statistically significant (see Table 4).

While the overall scores for teaching a separate international IS course suggest some hesitancy on behalf of the respondents (means = 4.08 and 4.71

TABLE 4

EFFECTIVENESS OF TEACHING ALTERNATIVES

Effectiveness	1st Survey		2nd Survey		Sig.	
	G	U	G	U	G	U
1 = very effective						
7 = very ineffective						
International topics incorporated only in select IS courses	3.39	3.47	3.71	3.72		
International topics integrated into core IS course offerings	2.93	3.23	3.05	3.06		*
Separate international course	4.87	5.18	4.08	4.71	.01	.10

G=graduate

U=undergraduate

*moving in positive international direction

respectively for graduate and undergraduate levels), they are significantly more effective than those found in the first survey. These changes, albeit subtle, may suggest that there is an increase in stand-alone courses and those teaching these courses have found this approach to be a more effective vehicle. This is a change from past studies which found little support for the specialized course alternative. Other explanations may be that IS is following the pattern of other functional areas by offering specialized international IS courses, or that we still have only a limited number of capable and interested faculty in teaching international IS courses. This latter explanation has some support based on the average number of faculty with international background or training. It should be noted that these evaluations of course format effectiveness are based on faculty respondents' perceptions, not formal student evaluations.

IS CURRICULUM INTERNATIONALIZATION TRENDS

Respondents were asked to indicate their level of agreement or disagreement with eight statements (1 = strongly agree; 7 = strongly disagree). The stronger their agreement with the statement, the stronger their support for internationalizing the curriculum. They first reacted to several statements reflecting the orientation and perspective from which international IT courses should be taught, i.e., a global, U.S., or local/regional perspective. As shown in Table 5, the results suggest increased support for teaching IS from a global perspective and decreased support for teaching IS from a local or regional perspective, as well as from a country orientation.

TABLE 5

INTERNATIONALIZATION PERSPECTIVES FOR IS CURRICULUM

<u>Internationalizing the IS Curricula</u>	<u>1st Survey</u>		<u>2nd Survey</u>		<u>Sig.</u>
	<u>Mean</u>	<u>Std Dev</u>	<u>Mean</u>	<u>Std Dev</u>	
1 = strongly agree 7 = strongly disagree					
IS courses should be taught from a:					
Global perspective	3.13	1.34	3.02	1.45	*
US perspective	4.00	1.55	4.22	1.49	
Local/regional perspective	4.81	1.75	5.07	1.69	
Institution will offer international IS course within 3 years	5.14	1.80	4.83	2.06	*
IS programs become similar to foreign IS programs in the near future	4.65	1.42	4.53	1.49	*
IS programs must be international	3.44	1.48	3.38	1.71	*
Your IS program is international	4.79	1.53	4.21	1.65	.02
There is an emphasis on 'internationalization'	2.30	1.18	3.34	1.62	.000
*movement in a positive international direction					

While an increasing number of respondents indicated that they will offer an international IS course within three years (see Table 5), on average, the schools are not offering standalone courses. This concurs with our previous comments regarding effectiveness of teaching alternatives. Certainly stand alone courses are not for everyone. A number of factors likely contribute to this finding, such as resource constraints, faculty interest and expertise, and administrative obstacles.

The respondents in both surveys uniformly agreed that IS programs must be international. The span of time only increased their commitment to this goal. The respondents did acknowledge progress towards internationalizing their respective IS programs within the last five years ($p = .02$), yet they still feel that they have not achieved their objective. A surprise finding was the reduced emphasis on internationalization perceived by the respondents in the second survey ($p = .000$). This result may actually be very positive in that the respondents' level of sensitivity to international is heightened over time such that they are not satisfied with where they are in contrast to where they want to be, where they think they should be, in the internationalization process.

CONCLUSIONS/FUTURE RESEARCH

This study not only contributes to the IS curriculum literature, but it also provides the first comparison of international IS curriculum trends over time. A major contribution of this study is that it serves as a base-line for future studies that follow our progress to internationalize the IS curriculum. Given the low percentage of faculty who are trained in international

IS, future work might examine doctoral programs to evaluate the extent to which this void is being addressed. Future work might also cover the monitoring of trends which are indicative of our progress in internationalizing over time, including the percentage of the IS program that is internationalized and the extent to which we perceive that our programs are internationalized. We would expect these two indicators to move in concert.

The longitudinal assessment is both positive and presents a challenge for the future. On a positive note, there has been steady progress in the movement to internationalize the IS curriculum. While the progress is limited, we are moving in the right direction. At the same time we acknowledge that different institutions will internationalize to varying degrees and employ different strategies to meet their individual program needs.

An important, significant challenge for the IS community is to stay in tune with the overall business school curriculum strategy and developments in industry. More specifically, as we continue to internationalize the IS program it is important not to operate in a vacuum, but be mindful of the increased emphasis on cross-disciplinary curriculum design in academe, cross-functional teams in industry, and the role IS will play in the expanding global picture.

ENDNOTE

1. The AACSB Membership Directory used for the follow-up study did not include all 122 of the original participants from the first study.

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