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Value-Added Processes by Faculty in LIS Education/ Le degré
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The Extent of Adoption of Internet Resource-Based Value-Added Processes by Faculty in LIS Education

Le degré d'adoption par le corps professoral en bibliothéconomie et sciences de l'information (BSI) des processus à valeur ajoutée accessibles par Internet, exploitant des ressources informatisées

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Résumé : L'enseignement en bibliothéconomie et sciences de l'information a subi des changements importants durant les dix dernières années. On note en particulier l'apparition dans les contenus de cours des technologies de l'information et un élargissement du domaine de l'information. Les approches stratégiques concernant les changements dans les contenus de cours vont de l'évolution naturelle à la révision complète. Cette étude, centrée sur l'approche par évolution naturelle, s'inscrit dans le cadre d'une recherche plus vaste, effectuée à la fin de la décennie, cherchant à mettre à jour les facteurs ayant motivé les professeurs à adopter une innovation dans le contenu de leurs cours et à montrer son degré d'intégration dans les cours enseignés. L'innovation sélectionnée dans le cadre de cette étude était complexe et liée aux processus susceptibles d'ajouter de la valeur aux ressources Internet. Les processus constitutifs de cette innovation étaient : une sélection de ressources Internet, l'organisation de ressources Internet, les services de référence Internet, la conception d'interfaces dans les bibliothèques électroniques, et l'analyse des utilisateurs dans les bibliothèques électroniques. Les résultats de l'enquête menée auprès du corps professoral en bibliothéconomie et sciences de l'information aux États-Unis et au Canada indiquent qu'il n'y a pas de différence dans le degré d'intégration des divers processus à valeur ajoutée accessibles par Internet. Cependant, les membres du corps professoral ayant adopté l'innovation les premiers étaient aussi ceux qui l'avaient intégré le plus complètement.

Mots-clés : Enseignement BSI, innovation curriculaire, ressources Internet, corps professoral BSI, cours BSI.

Abstract: Significant changes have taken place in library and information science (LIS) education within the last decade; notably, LIS course content shows evidence of an infusion of information technologies and a broadening of the information domain. Strategic approaches to course-content change in LIS have ranged from natural evolution to complete revision. This study, which is centred in the natural evolution approach, was undertaken as part of a larger study at the end of the decade to find factors that influenced LIS faculty to adopt innovations in course content and examine the extent to which faculty adopters had integrated an innovation in the courses they taught. The innovation chosen for the study was complex, related to processes that add value to Internet resources. The processes that constituted the innovation were selection of Internet resources, organization of Internet resources, Internet reference services, interface design in digital libraries, and user analysis in digital libraries. The results of a survey of LIS faculty in the United States and Canada showed that there were no differences among faculty adopters in the extent to which they had integrated the various Internet resource-based value-added processes. However, faculty members who were early in adopting the innovation had also integrated the innovation to a greater extent than did late faculty adopters.

Keywords: LIS education, curriculum innovation, Internet resources, LIS faculty, LIS courses

Introduction

Phenomenal developments in networking and telecommunications in the nineties created an environment of opportunities as well as challenges for LIS education. As change takes place, success and sustainability depend on realigning, restructuring, and adapting. Consequently, the changes in information format and access resulting primarily from advances in the Internet and Web were instrumental in restructuring LIS education in the nineties. The objective was to meet the societal demands for new knowledge and professional skills in digital information access.

In LIS education, the major response to developments in the information economy was curriculum innovation: ranging from revision and broadening of existing curricula to offering joint degrees, new degrees, or specializations. A study funded by the Kellogg foundation titled the Kellogg-ALISE Information Professions and Education Reform (KALIPER) Project analysed LIS programs in the late nineties to understand trends in LIS education (Pettigrew and Durrance 2000; 2001; Reston 2000).

The KALIPER Project included 33 LIS programs in its analysis and reported that many LIS programs were expanding their curricula in an effort to adapt to new, broader information environments that transcended traditional libraries.

The KALIPER Report explained that several LIS programs were responding to market demands beyond those of libraries in revising curricula. According to the project report, some schools entered into strategic alliances with other academic units and/or government agencies. That is, to support the broadened scope of their teaching initiatives, educators drew on the knowledge and expertise of other disciplines, such as business, law, psychology, computer science, and engineering and hired new faculty from those fields (Logan and Hsieh-Yee 2001). They also engaged in recruiting students with varied educational background and work experience who could pursue the new information-related areas.

As LIS programs hired faculty from other disciplines, either as full-time or joint appointments, the programs became increasingly interdisciplinary and affected not only the nature of courses offered but also the balance between traditional LIS and new information courses. According to Logan and Hsieh-Yee, some educators considered the library market a low-growth area and felt justified in paying more attention to other, more lucrative sectors of the information industry and in emphasizing other information-related fields within school curricula (Logan and Hsieh-Yee 2001). However, there were those who believed that knowledge and skills related to library work could be transferred to other pertinent information-related environments, so they felt that library science ought to remain the main focus in LIS programs. Van House and Sutton, who analysed changes in LIS curricula during the period from a theoretical perspective in their panda syndrome articles, expounded on the position of LIS schools caught in the tension between traditional LIS fields and broader information-related fields (Sutton 1999; Van House and Sutton 1996). By the end of the nineties, several schools had changed their names to reflect the shift in focus from libraries to broader information environments. The most popular cosmetic trend was to drop the word *library* altogether from their names.

Many schools grappled with related issues. Programs were unclear about the role of LIS in the larger information economy. Also, with expanded course offerings, the core became difficult for schools to identify (Moran 2001). Some questioned whether librarians and information specialists

could even be prepared in the same program, because the broadening of curriculum placed pressure to expand the core and to extend the length of the master's degree in an already exhausted program (Schlessinger, Schlessinger, and Karp 1991). Some advocated consulting practitioners about the competencies deemed necessary (Moran 2001). In addition to needing monies to develop and maintain an information technology infrastructure, schools needed monies to recruit part-time faculty who could support existing and new teaching initiatives in a highly competitive university environment (Logan and Hsieh-Yee 2001). A problem was that although part-time faculty members brought cutting-edge knowledge and skills to teaching, they required more supervision to ensure quality in teaching (Logan and Hsieh-Yee 2001). Also, part-time faculty members are not committed to a program for a long time and few participate in curriculum decisions. Consequently, meaningful and substantive curriculum change can take place only with full-time faculty members and requires this segment's cooperation and approval.

Innovation in courses

As noted, curriculum innovation was taking place in the midst of debate about the focus of change, amount of change, and direction of change. Some believed that traditional LIS knowledge and skills could be expanded to adapt to the changes taking place, whereas others supported the move of LIS education beyond libraries to broader information environments. New courses such as digital libraries, digital resources for teaching and learning in K-12 environments, and social aspects of information systems were introduced in programs (Daniel and Saye 2000). The new or revised courses included ones that reflected a transfer of library-based skills to broader applications. For instance, "cataloguing" became "representing, organizing, and storing information" at the University of Toronto (Logan and Hsieh-Yee 2001).

Few studies explored faculty behaviour in curriculum innovation during the period. In an early survey of faculty who taught reference-related courses in 1997, Hsieh-Yee found that more than 80% of the faculty covered Internet tools; the subtopics covered in the study focused solely on Internet tools, such as email and Telnet, rather than Internet information (Hsieh-Yee 1997). Faculty did not differ on the basis of courses they taught; however, they allocated only a small amount of class time to Internet tools, and the coverage was uneven, ranging from 0% to 72%.

A majority of the faculty, however, valued the Internet and covered it before the Internet became mainstream.

Toward the end of the nineties, two surveys explored digital information resources in LIS teaching. A timely survey by Park in 2002 did not analyse faculty behaviour but revealed seven full courses on cataloguing Internet resources and metadata that were innovative at the time. Full courses were often offered as seminars or special topics; nonetheless, digital resources, predominantly Web resources, were integrated in several classification, organization of information, or cataloguing courses. Most often, a unit of a course was allocated to cataloguing electronic resources in an integrated approach. Faculty covered metadata standards, including Dublin Core, Text Encoding Initiative standard, Encoded Archival Description, and Government Information Locator Service standard. The study was significant at the time, given the importance of incorporating digital information resources in teaching cataloguing and preparing students for an environment of digital information and services.

Around the same time, Allard, in her survey of digital library courses, analysed 19 LIS programs in 1999 and emphasized the importance of understanding users in designing digital libraries, especially in developing digital library interfaces (Allard 2002). An earlier survey of digital library education in 1998 by Spink found eight LIS programs covering digital libraries in a mix of course types at the master's level (Spink and Cool 1999). Allard reported that only three programs offered digital library courses and two covered digital libraries in special topics courses. However, it was unclear whether LIS programs could undertake the teaching of digital library courses comprehensively. Allard believed that while LIS students could be prepared for client services in the use of the digital library, they might not possess prerequisite knowledge and skills for technical services that require understanding of system design and advanced mark-up languages. In fact, Spink found that the more technical aspects of digital libraries were covered by computer science departments to educate their students.

Regardless of the type of curriculum innovation, faculty members are critical for change to occur in LIS education. In past studies, LIS faculty members have cited concerns with equipment, lack of technological support, lack of class time, and lack of knowledge as barriers to teaching in new content areas (Hsieh-Yee 1997; Park 2002). This study reported here sought to analyse faculty behaviour in curriculum innovation that

represented an expansion of traditional LIS knowledge and skills. Given the changes in information format and access resulting from the proliferation of Internet resources at the time, the study explored the extent to which LIS faculty covered Internet resource-based value-added processes in their courses. The innovation is complex in that it covered all processes that added value to Internet resources to enhance access: selection of Internet resources, organization of Internet resources, Internet reference services, interfacing Internet resources, and understanding users of Internet resources. Full description of the innovation can be found in a companion article (Ankem 2004). The focus was on LIS curriculum content that constituted innovative processes in library work that added value to Internet information.

The first part of this study explored the factors that influenced LIS faculty to adopt Internet resource-based value-added processes in their courses (Ankem 2004). The examination of faculty innovative behaviour was accomplished by applying a model of adoption of innovations that purports that material resources, experiential resources, value attributed to the innovation, and communication with adopters influence adoption of an innovation (Marcus 1986). The results of the study showed that the value attributed to the innovation by faculty members was an influential factor in early adoption. The companion article presents the findings from the first part of the study (Ankem 2004). The second part of the study presented here analysed the extent of adoption of Internet resource-based value-added processes by LIS faculty in the courses they taught.

Method

The innovation comprised selection of Internet resources, organization of Internet resources, interfacing Internet resources, and adaptation to users of Internet users. Selection of Internet resources constituted processes that enable decisions to include or exclude Internet resources for ownership as well as access in a library. Organization of Internet resources entailed all processes for systematically structuring Internet resources in a library and included Internet subject guides and metadata for resource description. Interfacing Internet resources covered any processes for formatting a system for efficient access to Internet resources and included interfacing techniques in a digital library. Understanding users entailed analysis of users of Internet resources to adapt the library to users. The

other three processes could be adapted to users, especially interfacing. As such, analysis of users of Internet resources to adapt any value-added process within a library to users was included in the fourth process. Consistent with the exponential growth of Internet resources during the period, a tremendous amount of literature was published on processes that added value to Internet resources and improved access. A full description of the processes can be found in the companion article, which covers literature that illustrates the application of the innovative processes until 1999—the time when the survey was conducted (Ankem 2004). LIS faculty's adoption of any of these innovative processes in course content was of interest in this study.

The results of the first part of the study analysed factors that affected early versus late adoption of Internet resource-based value-added processes among LIS faculty in course content (Ankem 2004). The second part of the study reported here focused on the extent of adoption of Internet resource-based value-added processes in course content.

Research questions in the second part of the study were:

1. Is there a difference among faculty adopters of Internet resource-based value-added processes in the extent of adoption of the innovation?
2. Do early faculty adopters of the innovation include Internet resource-based value-added processes in course content to a greater extent than late faculty adopters of the innovation?

A questionnaire described below was mailed to 256 LIS faculty members in the United States and Canada. A systematic sample of faculty members who taught in any of the areas related to the innovation was selected from the current Association for Library and Information Science Education (ALISE) directory at the time. For example, if a faculty member taught a cataloguing or classification course, he or she received the questionnaire to see if the faculty member incorporated cataloguing/indexing or classification of Internet resources in course content. Also, only full-time faculty were selected because part-time faculty members, although they make significant contributions, are not part of curriculum-related decisions in a school and are not committed to a school over the long term.

Of the 256 faculty members, 132 faculty members returned the questionnaire, constituting a response rate of 53%. A total of 35 questionnaires were removed from analysis because the respondents did not complete the questionnaire, the faculty member did not teach in the area of interest to the study, or the faculty member did not have at least 3.5 years of teaching experience. The last was required because retrospective data on adoption/non-adoption during different time periods was necessary for the analysis of adoption of Internet resource-based value-added processes over time.

Questionnaire

The Internet resource-based value-added processes were rephrased to make them clear and more easily understandable to respondents. The list on the questionnaire included selection of Internet resources, organization of Internet resources (developing subject guides, indexing Internet resources, cataloguing Internet resources, resource description with meta-data), interface design in digital libraries, Internet reference services, and user analysis in digital libraries (understanding user information needs and uses for adapting digital libraries). To determine adoption, faculty members were asked if they incorporated at least an hour of content on Internet resource-based value-added recourses in course(s) taught.

Two questions were particularly important to this part of the study. The first asked about the year during which the faculty member first incorporated Internet resource-based value-added processes in a course: before 1995, 1995–6, 1996–7, and after 1997. The other question asked the faculty member about the number of hours allocated to the innovative process on the syllabus for a course by 1999—the time when the survey was conducted. This latter question allowed the analysis of extent of adoption of Internet resource-based value-added processes in course content among LIS faculty.

Results

Before data analysis, the respondents ($N = 97$) were categorized into three groups—T1, T2, and T3—based on their time of adoption of Internet resource-based value-added processes. Respondents who adopted before the academic year 1995–6 and the remaining respondents were

Table 1. Age of adopters and non-adopters of Internet resource-based value-added processes

Age	T1		T2		T3		Total	
	A	NA	A	NA	A	NA	A	NA
26–35	1	1	0	1	0	1	1	1
36–45	6	14	6	8	5	3	17	3
46–55	12	21	8	13	11	2	31	2
56–65	14	22	8	14	12	2	34	2
66 and above	3	2	1	1	0	1	4	1
Total	36	60	23	37	28	9	87	9

Note: T1 = before academic year 1995–6, T2 = academic year 1995–6, and T3 = after academic year 1995–6

A = adopter, NA = non-adopter; missing data for respondents = 1

grouped into T1. The adopters in T1 were labelled “early adopters.” Adopters in T1 were then removed from the sample. Respondents who adopted during the academic year 1995–6 and the remaining respondents were grouped into T2. Adopters in T2 were labelled “late adopters.” Adopters in T2 were then removed from the sample. Respondents who adopted after the academic year 1995–6 and the remaining respondents were grouped into T3. Adopters in T3 were labelled “later adopters.” There were 36 early adopters and 61 non-adopters in T1, 23 late adopters and 38 non-adopters in T2, and 28 later adopters and 10 non-adopters in T3.

Table 1 illustrates that the majority of the early adopters were in the 56–65 age group and 46–55 age group, followed by adopters in the 36–45 age group. Between 30% and 40% of the respondents within each of the three age groups had adopted. Too few respondents were in the 26–35 and the 66-and-over age groups for any valid comparisons of percentages that adopted. However, the percentages of respondents, overall—that is, regardless of whether they were adopters or non-adopters—within each age category were similar to those reported by ALISE. The proportions of respondents in most age groups were within $\pm 5\%$ of those reported by ALISE. In the 46–55 age group, the proportion of respondents was approximately 7% lower, and in the 56–65 age group, the proportion of respondents was approximately 7% higher, than those reported by ALISE.

Table 2. Gender of adopters and non-adopters of Internet resource-based value-added processes

Gender	T1		T2		T3		Total	
	A	NA	A	NA	A	NA	A	NA
Male	22	26	8	18	14	4	44	4
Female	14	33	14	19	14	5	42	5
Total	36	59	22	37	28	9	86	9

Note: T1 = before academic year 1995–6, T2 = academic year 1995–6, T3 = after academic year 1995–6

A = adopter, NA = non-adopter; missing data for respondents = 2

Table 3. Rank of adopters and non-adopters of Internet resource-based value-added processes

Rank	T1		T2		T3		Total	
	A	NA	A	NA	A	NA	A	NA
Assistant professor	7	15	6	9	6	3	19	3
Associate professor	14	29	11	18	15	3	40	3
Professor	13	15	5	10	7	3	25	3
Administrator	2	1	1	0	0	0	3	0
Total	36	60	23	37	28	9	87	9

Note: T1 = before academic year 1995–6, T2 = academic year 1995–6, T3 = after academic year 1995–6

A = adopter, NA = non-adopter; missing data for respondents = 1

Table 2 indicates that males were earlier to adopt, with 46% of male respondents being early adopters, as opposed to 30% of female respondents. The ratio of male to female, overall—regardless of whether they were adopters or non-adopters—was 1:1, which is the same as that reported by ALISE.

Table 3 shows that the majority of the early adopters were associate professors, followed by professors and assistant professors. While 46% of the professors had adopted early, between 30% and 40% of associate and assistant professors had. Again, there were too few administrators for meaningful comparisons of percentages that adopted. Overall, inclusive of both adopters and non-adopters, percentages of respondents within each category were somewhat similar to those reported by ALISE. Proportions of professors and administrators were within ± 5 percentage

Table 4. Extent of adoption of the Internet resource-based value-added processes

Processes	Adopters	M	SD
Selection of Internet resources	20	9.40	12.83
Organization of Internet resources	21	10.86	12.97
Interface design in digital libraries	2	26.00	19.80
Internet reference services	29	12.69	12.83
User analysis in digital libraries	15	16.27	13.59
Total	87	12.41	13.17

points. However, compared to statistics reported by ALISE, associate professors were over-represented by 12 percentage points and assistant professors were under-represented by 10 percentage points.

Differences in the extent of adoption among adopters of the Internet resource-based value-added processes

Table 4 shows that each Internet resource-based value-added process had been adopted by at least some respondents. The highest number of adopters taught the process *Internet reference services* ($n = 29$), and the lowest number of adopters taught the process *interface design in digital libraries* ($n = 2$). The numbers of adopters teaching the processes *selection of Internet resources* ($n = 20$) and *organization of Internet resources* ($n = 21$) were close and second highest, and the number of adopters teaching the process *user analysis in digital libraries* ($n = 15$) was somewhat lower.

Data on the number of hours allocated in course content (i.e., the extent of adoption) to an Internet resource-based value-added process by T3 (the last time period) were gathered from each respondent at the time of completion of the questionnaire. The sample sizes of the groups that consisted of adopters of the processes were examined before selecting a statistical test to find whether there were any differences in the extent of adoption—gathered as hours designated to the innovation in course content. As the sample sizes were unequal, the homogeneity of variance test was conducted to find if the groups were homogeneous in variance. The results of the test are presented in table 5. The results illustrate that the difference between group variances was insignificant ($p > .01$). The variances of the groups were equal; therefore, the groups were homogeneous.

Table 5. Homogeneity of variance test

Levene statistic	p
0.39	.82

Table 6. Difference in the extent of adoption between adopters of the Internet resource-based value-added processes

	df	SS	MS	F	p
Between groups	4	826.59	206.65	1.20	.32
Within groups	82	14,082.51	171.74		
Total	86	14,909.10			

To elicit differences in the extent of adoption among adopters of the Internet resource-based value-added processes in groups of unequal sizes but homogeneous variances, the ANOVA procedure was conducted. These results are presented in table 6. The results show that there was no difference among the adopters of the processes—*selection of Internet resources*, *organization of Internet resources*, *interface design in digital libraries*, *Internet reference services*, and *user analysis in digital libraries*—in the extent to which they adopted the processes in course content ($p > .05$). At the time of completion of the questionnaire at T3, the Internet resource-based value-added processes had been adopted to a similar extent.

However, an examination of both the numbers of adopters and the mean values, in hours, of the extent of adoption for each process, presented in tables 4 and 6, reveals that, while some processes were taught by markedly fewer adopters, they were not, interestingly, statistically different in the extent of adoption. The mean value for the process taught by the fewest adopters was, in fact, the highest. For example, *Internet references services*, taught by 29 respondents, had a mean extent of adoption value of 12.69 hours; whereas *interface design in digital libraries*, taught by only 2 respondents, had a mean extent of adoption value of 26 hours, the highest. It seems that the numbers of adopters of a process did not positively affect the depth of course-content coverage; that is, more adopters did not lead to a greater extent of adoption.

Table 7. Extent of adoption of Internet resource-based value-added processes by early and late adopters

Time of adoption	Adopters	M	SD
T1—before academic year 1995–6	36	7.50	15.58
T2—academic year 1995–6	23	12.74	12.36
T3—after academic year 1995–6	28	5.61	5.51
Total	87	12.41	13.17

Difference in the extent of adoption between early and late adopters

Faculty had also adopted the processes at different time periods: T1, T2, and T3. To obtain data regarding the time of adoption of a process, respondents were asked about the value-added process they had incorporated into course content and the year of adoption. Information about the number of hours allocated to the process in course content by T3 was also gathered (see “Method”).

The second research question in the study was whether there was a difference in the extent of adoption by respondents, based on their time of adoption. In other words, did faculty who adopted early include the process to a greater extent? If so, early adoption matters, because it indicates that, in addition to being early in adopting the process, adopters covered the innovation in more depth.

To elicit differences between early and late adopters in the extent of adoption of Internet resource-based value-added processes in course content, the sample sizes of the groups were again examined. The sample sizes of these groups were also unequal, so the homogeneity of variance test was conducted to see if groups were homogeneous in variance. The results of the test are presented in table 8. The results of the test indicate that the homogeneity of variance assumption was rejected; that is, group variances were unequal ($p < .01$). Therefore, the Kruskal-Wallis test, an alternative to the ANOVA procedure, was conducted to find if differences in the extent of adoption existed between the groups. The results

Table 8. Homogeneity of variance test

Levene statistic	<i>p</i>
11.58	.00

Table 9. Difference in the extent of adoption of Internet resource-based value-added processes between early and late adopters

Time of adoption	Mean rank	χ^2	<i>p</i>
T1—before academic year 1995–6	53.14	14.75	.00
T2—academic year 1995–6	47.57		
T3—after academic year 1995–6	29.32		

Table 10. Pair-wise comparisons, Mann-Whitney test

Comparisons	Mean rank		Wilcoxon <i>W</i>	<i>p</i>
T1 and T2	31.69	27.35	629	.34
T1 and T3	32.22	20.89	642	.00
T2 and T3	39.94	22.93	585	.01

of this test are presented in table 9. The results show that there was a difference in the extent of adoption of Internet resource-based value-added processes between early and later adopters ($p < .05$).

Further tests were conducted to find which pairs of groups were different. The results of these Mann Whitney follow-up tests are presented in table 10. To account for Type-1 error concerns, because of multiple comparisons, an adjustment was made to the alpha level for the three pair-wise comparisons in table 10. The adjusted probability was 0.02, that is 0.05 divided by the number of comparisons. Table 10 shows that, by following this method, group difference probabilities of less than the adjusted alpha level, 0.02, were found to be significant.

As illustrated by the comparisons in table 10, early adopters in T1 had adopted Internet resource-based value-added processes to a greater extent than did later adopters in T3 ($p < .02$). Late adopters in T2 had also adopted Internet resource-based value-added processes to a greater extent than did later adopters in T3 ($p < .02$). However, there was no difference in the extent of adoption of Internet resource-based value-added processes between early adopters in T1 and late adopters in T2. In summary, the results show that earlier adopters had included the innovation in course content to a greater extent at the time of completion of the questionnaire.

Conclusion

The majority of adopters had incorporated the innovation early, as is evident in the high number of adopters (38) in T1. It is interesting that the highest number of early adopters tended to be in the 56–65 age group. Consistent with the ALISE statistics, there were fewer respondents, overall, in the younger, 36–45 age group. While the percentages that adopted in both categories—56–65 and 36–45—were somewhat similar, more early adopters were in the 56–65 age group. More early adopters were also male and either associate or full professors, not assistant professors.

The finding that fewer assistant professors were early adopters does not appear to have been linked to the fact that, as a result of the study requirement that respondents have had at least three years of teaching experience, there was a lower representation of assistant professors in the study data than in the ALISE statistics. Nor could the requirement that a participant have had at least three years' experience have caused problems related to validity. Indeed, this requirement was needed for analysing behaviour over time—that is, faculty behaviour over a three-year period. The study was about the decisions made by faculty already teaching in LIS over a period of three years after the innovation was introduced. The innovative behaviour of assistant professors who did not have this experience was, therefore, not relevant.

Although there was no difference in the extent of adoption among adopters of the processes by T3, there was a difference in the extent of adoption of the innovation between early and later adopters. The Internet resource-based value-added processes—*selection of Internet resources*, *organization of Internet resources*, *interface design in digital libraries*, *Internet reference services*, and *user analysis in digital libraries*—were incorporated in course content to a similar extent, even though some processes, such as *user analysis in digital libraries*, had very few adopters. However, those who were early in adoption had also assigned more hours to the innovation in course content. They treated the innovation in more depth. In essence, the number of adopters did not influence the extent to which processes had been integrated, but early adoption made a difference in the extent to which the innovation was incorporated.

Thus, in addition to being timely, the early adopters were also teaching the innovation to a greater extent. Certain factors have already been

found to influence early adoption by LIS faculty, as has been reported of the first part of this study (see Ankem 2004). If, in addition to its timeliness, early adoption culminates in greater coverage of the innovation in course content, as results reported here indicate, then it may be worthwhile for LIS administrators to work on the factors influencing adoption and to actively assist faculty in being early to adopt innovations into course content.

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