

NATIONWIDE SURVEY OF E-COMMERCE APPLICATIONS IN HIGHER EDUCATION

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ABSTRACT

The authors surveyed academic vice presidents in schools accredited by each of six regional accreditation organizations recognized by the Council for Higher Education Accreditation to determine the extent to which schools participate in business-to-consumer e-commerce. The study revealed how classifying variables of accreditation region, enrollment, public/private status, and degree levels awarded affected e-commerce availability of 17 applications. Four of the 17 applications were available in over 80% of responding schools. Nine of the applications were unavailable in 60% or more of the schools. Early e-commerce application development appears to focus more on information applications than processing applications. Schools with the following characteristics were more likely to have more online applications: larger schools, public institutions, and schools offering higher-level degrees. Differences from region to region were not pronounced.

Keywords: e-commerce, higher education, online, student services, administration

INTRODUCTION

This research investigates the extent to which higher education institutions are involved in the growth of e-commerce applications for their student body. The research also looks at the extent to which e-commerce in academic organizations is like that of corporate organizations. As retailers move into Internet-based transactions, are colleges and universities also moving to deliver their products and services in a digital environment? Which applications are most common? Which are least common? Are there differences among schools with different characteristics such as public/private, student enrollment, and accreditation region?

This project investigates college and university use of the business-to-consumer model, not the business-to-business model or intranet model. Academic institutions are somewhat different from retailers such as Internet giant Amazon.com in that the school model is more a deliverer of free services than retailer. Some parallels, however, are still valid. Dickson and DeSanctis' model of e-commerce identified categories such as focused distributors (retailer, marketplace, aggregator, and exchange); portal models, which can be horizontal, vertical or affinity models; producer models (manufacturers, service providers, educators, etc.); and infrastructure provider models (4). Dickson and DeSanctis placed colleges and universities in the producer model, although a college or university might have characteristics of some other models as well.

In a 1999 publication, Norris and Olson predicted "over the next two to three years, the emergence of pervasive electronic commerce applications will transform the manner in which colleges and universities conduct their most basic business functions" (6). They further noted that this would result in reduced operating expenses, enhanced service quality delivery, and even

outsourcing of non-core business operations. As an example of this, Burrell described Plymouth State College's great success with its web portal for online student services and how the school worked effectively with a vendor-developed infrastructure (2).

The American Association of Collegiate Registrars and Admissions Officers (AACRAO) conducted a survey of online registration services in 1999 (1). Their study of 334 member institutions revealed a high degree of interest in online services. Institutions were more likely to be providing informational services such as catalog information rather than processing services such as registration. AACRAO recently posted a brief summary of the 2003 replication of the online registration services study (8). Once again, schools tended to provide information before processing services. Both the 1999 and the 2003 study results indicated the following categories were more likely to provide online registration services: public institutions, institutions with higher enrollments, institutions with larger budgets, and institutions with more full-time staff.

Kleen and Shell's 2001 study of 113 schools accredited by the Southern Association of Colleges and Schools (SACS) revealed that more than 50% of surveyed schools provided online directories of faculty, online directories of services, online academic catalogs, and online applications for admission (5). Least available applications included ordering parking permits, reserving dorm rooms, ordering transcripts, receiving "live" academic advice, and pursuing a complete degree through web courses. Public institutions, larger institutions, and institutions offering higher level degrees were more likely to have various e-commerce applications.

The authors of the current study expect universities to be followers of the mainstream elements of e-commerce. The researchers expect that universities will have adopted selected elements of e-commerce that (a) are simple to adopt, (b) have favorable cost-benefit, (c) are clearly connected to the institution's mission, and (d) have direct benefit to students. The researchers are interested in determining whether the same institutional characteristics identified in earlier studies continue to identify schools with more e-commerce applications.

METHODOLOGY

The research methodology for this study included a nationwide survey similar to a 2001 study of e-commerce applications available at schools accredited by the Southern Association of Colleges and Schools (SACS) organization. The researchers used an instrument designed by Kleen and Shell (2001) with minor modifications. The instrument was designed to determine which of the identified e-commerce activities are present on a school-by-school basis. Only accredited schools offering a bachelor's degree or higher were included. The instrument was mailed to a systematic random sample of 669 schools selected from all six regional accreditation organizations for higher education recognized by the Council for Higher Education Accreditation (CHEA) (3). The organizations included: Middle States Association of Colleges and Schools; New England Association of Schools and Colleges; North Central Association of Colleges and Schools; Northwest Association of Schools, Colleges, and Universities; Southern Association of Colleges and Schools; and Western Association of Schools and Colleges. As in the 2001 study, the academic vice president or provost received the instrument; that office is almost universal among colleges and universities and should be broadly knowledgeable of the school's e-commerce offerings.

Classification of respondent data included accreditation region, school state, school enrollment, whether public or private, and level of degrees offered. The descriptive results illustrate which e-commerce applications are most common and which are least common on higher education campuses across the country, as well as which were developed on campuses first versus which have come later. Hypothesis tests, based on cross tabulation and Chi square, show how or whether the extent of e-commerce applications varies with the classification variables.

FINDINGS

The findings section is organized into three parts: (1) descriptive data including simple percentages on classification data, (2) e-commerce application availability, and (3) two-dimensional cross tabulations accompanied by appropriate Chi square hypothesis tests.

Descriptive Statistics

A total of 260 usable responses were analyzed, representing a 38.9% response rate. Table 1 provides classification information about the responding schools. All six accreditation regions were represented in the responding schools, with the two largest regions, North Central Association of Colleges and Schools, and Southern Association of Colleges and Schools, having the two largest groups of respondents. Although not shown within the table, the six states having the largest numbers of respondents included California (13), Illinois (12), New York (12), Pennsylvania (12), Missouri (11), and Ohio (10). Among the 233 schools that indicated state, 45 states and Washington D.C. were represented.

Almost three-fifths of the responding schools reported enrollments of 2,500 students or less. Private schools accounted for almost two-thirds (66.9%) of the respondents. Of the 239 schools reporting their highest degree offered, bachelor's degree granting institutions were the smallest group; master's level institutions were the largest category at 36.9%. Although the Southern Association of Colleges and Schools uses five classification levels for institutions offering a bachelor's degree or higher, these were collapsed into the three degree levels used by the other five accrediting groups—bachelor's, master's, and doctoral.

E-Commerce Availability

Over two-thirds of responding schools reported having four of the 17 e-commerce *applications available for a year or longer*. As displayed in Table 2, these applications included completing an application for admission online, searching an online faculty directory for contact information, searching an online directory of services for contact information, and searching an online academic catalog. In Kleen and Shell's 2001 SACS study, the same four applications topped the list of e-commerce applications available in southern region schools. In the current study, seven of the applications were reported available in over 50% of responding schools (calculated for each application by adding percentages in columns 2, 3, and 4).

Table 1		
Demographic Characteristics of Responding Schools		
(n = 260)		
Demographics	No.	Percent
Region		
Middle States	43	16.5
North Central	96	36.9
New England	26	10.0
Northwestern States	7	2.7
Southern Association	72	27.7
Western Association	16	6.2
Size of School		
Under 1,000	74	28.5
1,000 – 2,500	74	28.5
2,501 – 5,000	35	13.5
5,001 – 10,000	39	15.0
10,001 – 20,000	26	10.0
Over 20,000	12	4.6
Public/Private Status		
Public	85	32.7
Private	174	66.9
No response	1	.4
Degree Level Offered		
Bachelor's	58	22.3
Master's	96	36.9
Doctoral	85	32.7
No response	21	8.1

Table 2 further displays the *most recent applications* implemented at responding schools. The percentages in this column were relatively small. Only three applications were reported by at least 8% of the respondents as being new within the previous 12 months. These included viewing final grades online, registering for classes online, and searching the academic catalog online. In the Kleen and Shell 2001 study of SACS schools, viewing final grades online and searching the academic catalog were two of the top four most recent online applications.

The *applications reported not available* by more than two-thirds of responding schools included ordering a parking decal, receiving “live” academic advice, pursuing a degree taking web-based courses only, and reserving dorm space. In comparison, in the Kleen and Shell 2001 study of SACS schools, purchasing a parking permit and pursuing a degree taking web-based courses only topped the list of applications *not* available.

Item	% Reporting a Year or More	% Reporting Less Than a Year	% Reporting Unknown Duration	% Reporting Not Available
Complete application for admission	67.3	7.7	6.2	18.1
Order a transcript	28.5	6.2	3.5	59.6
View final grades	44.2	10.8	3.8	41.2
Register for classes	40.8	10.0	5.4	43.8
Search an online directory of faculty	73.5	3.8	11.2	11.2
Search an online directory of university services	73.5	3.1	11.2	11.2
Search academic catalog online	68.8	8.1	9.2	12.7
Audit academic performance online	23.8	6.9	3.1	64.2
Purchase textbooks from on-campus bookstore	21.9	6.2	4.2	61.5
Pay tuition and fees	19.2	6.5	3.9	66.5
Reserve dorm space	7.7	1.9	2.3	73.5
View financial status with university (fees, fines, etc.)	30.8	7.3	2.3	55.8
Order a parking decal or permit	6.9	.8	1.9	79.2
Receive “live” academic advice	13.8	2.3	3.1	77.7
Schedule meetings such as tutoring, counseling, etc.	22.3	3.5	7.7	61.2
Take a complete web-based course	46.2	3.5	10.0	39.2
Pursue a degree, taking web-based courses only.	18.1	2.7	1.9	76.5

* “Don’t know” answers (typically less than 1%) not reported in table

Cross Tabulation and Chi Square—E-commerce Applications

This section reports several sets of two-dimensional comparisons. One set includes a cross tabulation and Chi square for each of the e-commerce applications against school region—17 tables and tests. Similar sets compare the 17 e-commerce applications to school size (enrollment), status (public/private), and level of degrees offered.

School region was cross tabulated against each of the 17 e-commerce applications. Differences from region to region were not pronounced. Only two applications were of significance at the .05 level: pay tuition and fees online and pursue online degree taking only web-based courses. For pursuing an online degree, schools in the Northeast, North Central, and Southern Association were more likely to answer “yes” to having the application. (See Table 3.)

School size (enrollment) was cross tabulated against each of the 17 e-commerce applications. (See Table 3.) For different size schools, availabilities differ significantly at either the .01 or .05 level for 14 of the 17 applications listed on the survey instrument. While Chi square does not

permit a direct cause and effect interpretation, it is clear that larger schools have greater availability of these applications and have had the applications longer than smaller schools. The percentage of “yes we have this application” rises as enrollment rises. These findings support the Kleen and Shell study (5) and the AACRAO studies (1, 8).

Item	By Region Signif.	By School Size Signif.	By School Status Signif.	By Highest Degree Signif.
Complete application for admission	.113	.000	.014	.702
Order a transcript	.179	.003	.013	.286
View final grades	.578	.000	.000	.001
Register for classes	.218	.000	.000	.007
Search an online directory of faculty	.423	.010	.011	.252
Search an online directory of university services	.141	.253	.030	.182
Search academic catalog online	.383	.109	.602	.736
Audit academic performance online	.693	.003	.232	.361
Purchase textbooks from on-campus bookstore	.506	.000	.002	.039
Pay tuition and fees	.046	.000	.000	.043
Reserve dorm space	.561	.000	.019	.494
View financial status with university (fees, fines, etc.)	.121	.000	.000	.180
Order a parking decal or permit	.264	.000	.001	.000
Receive “live” academic advice	.562	.017	.486	.090
Schedule meetings such as tutoring, counseling, etc.	.239	.338	.747	.306
Take a complete web-based course	.330	.000	.000	.000
Pursue a degree, taking web-based courses only.	.035	.001	.000	.015

School status (public/private) was cross tabulated against each of the e-commerce applications. Based on this cross tabulation and Chi square calculations, availabilities differ significantly at the .01 or .05 level for 13 of the 17 applications. The percentage of “yes we have this application” is higher in the public institutions. Differences significant at the .01 level were found for the following applications: view final grades online, register for classes online, purchase textbooks online, pay tuition and fees, view financial status, order a parking decal, take a complete web-based course, and pursue a degree taking web-based courses only. (Refer to Table 3.)

Highest degree offered by a school was cross tabulated against each of the e-commerce applications. Based on Chi square calculations, significant differences at the .01 or .05 level were found in 7 of the 17 applications. In each instance, the percentage having the application is significantly *lower* in the institutions awarding bachelor’s degrees only. (Refer to Table 3.)

SUMMARY AND CONCLUSIONS

Accredited schools from the six regional accreditation organizations for higher education recognized by the Council for Higher Education Association were surveyed to determine business-to-consumer e-commerce applications available on their campuses. Availability of 17 applications was analyzed by classification variables including accreditation region, school enrollment, public or private status, and levels of degrees offered by the institution.

Based on the 260 responding schools, the most available business-to-consumer e-commerce applications included information applications such as searching an online faculty directory for contact information, searching an online directory of services for contact information, and searching an academic catalog. Additionally, completing an application for admission online also was available in over 80% of schools surveyed. Less than one-fourth of the schools surveyed offered online applications of ordering a parking permit, receiving “live” academic advice, pursuing a degree by taking web courses only, and reserving dorm space. Generally, schools with the following characteristics were more likely to have online business-to-consumer applications: larger schools, public schools, and schools offering higher level degrees. These findings are consistent with findings of earlier studies conducted by AACRAO, and Kleen and Shell. Differences from region to region were not pronounced.

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