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Online Workforce Development in Community Colleges: Connection with Community, Institutional, and Governance Factors

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Abstract

This study examined community and institutional factors that influence offering online workforce development programs in community colleges. The study included a random sample of 321 community college in the United States. Findings conclude that colleges operating under statewide governance structures and in states with more highly centralized statewide practices have more online occupational programs than other types of institutions. In addition, student racial demographics factor into online course offerings. Institutions with higher percentages of White students are more likely to offer online occupational programs. These findings illustrate a potential need for additional online program development in colleges with larger percentages of students of color and raise questions about how states with decentralized systems can increase educational access by facilitating additional online workforce development programs.

Keywords: workforce development, online education, state governance , occupational education, career and technical education, organization structure

Online workforce development programs provide access and convenience that allow students to develop job skills, achieve economic mobility, and increase their contributions to society (KnowledgeWorks Foundation, 2002; Parsad & Lewis, 2008; Russell, Lippincott, & Getman, 2013). Despite the prevalence of online degrees in most U.S. community colleges, some institutions offer more online programs than others (Lokken & Mullins, 2014). Some colleges offer one or two online programs and primarily offer online courses to supplement face-to-face offerings, while other colleges offer a full array of online programs. This project sought to understand the factors that influence such differences. As the first part of a larger project to

understand online career and technical education (CTE) in community colleges, this study examined the connection between institutional, economic, and social indicators that influence the prevalence of online occupational programs.

The availability of online education at community colleges is growing. With the advent of online education, two-year colleges quickly became the most dominant providers of online education (Allen & Seaman, 2003) in response to their mission to increase accessibility. Ninety-six percent of public community colleges offer one or more online courses (Parsad & Lewis, 2008), and 87% of public community colleges offer at least one entire degree online (Lokken & Mullins, 2014). Lokken and Mullins have found that community colleges report a five to nine percent increase in online enrollment for each of the last five years although that growth has slowed from the double digit increases seen ten years ago. In recent years, online enrollment growth has been a dominant source of overall enrollment growth. Despite the large number of online courses available, 47% of survey respondents indicated that their college is not keeping pace with students' demand for online courses.

Online education provides opportunities for community colleges to fulfill their workforce and economic development missions through providing more convenient access to those who cannot attend face-to-face courses (Floyd, 2003; Johnson, et al., 2003). A national study from over ten years ago found that 76.3% of responding community colleges were offering occupational *courses* through technology-enabled distance learning (Johnson, et al., 2003). However, a more recent study found that only 47.5% of institutions were offering any occupational *programs* online (Githens, Sauer, Crawford, & Wilson, 2012). . That study found that of the institutions offering online occupational programs, they averaged 8.4 such programs per institution.

Multiple studies have examined the student outcomes of online and face-to-face studies within the context of applied workforce development programs and other subjects (Benson, et al., 2004; Fjermestad, Hiltz, & Zhang, 2005). The studies consistently find online or blended courses have the same or better learning outcomes when compared with traditional face-to-face courses. Issues surrounding institutional context, policies, and organizational structure are critical in determining the success and sustainability of online learning programs (Arbaugh & Benbunan-Fich, 2005; Cox, 2005; Vrasidas & Glass, 2002) and have received less attention in previous research studies (Instructional Technology Council, 2011). To address this need, we consider the macro structures in each state, specifically the degree of centralization and institutional governance structures (Lovell & Trough, 2004). For this study, a database was developed using existing data from national, state, and institutional sources. After compiling the database, the data were examined to understand (a) the relationship between statewide governance structures and offering of online occupational programs and (b) the institutional, social, and economic characteristics that increase or decrease the likelihood of community colleges offering such programs. This project addresses the following research questions:

1. Is there a relationship between statewide community college governance structure and the number of online occupational programs offered?
2. Is there a relationship between degree of statewide centralization of community colleges and the number of online occupational programs offered?
3. Is there a relationship between a community college's local context and whether online occupational programs are offered?

Since the economic crisis of 2008, political discourse around community colleges has increased and emphasized both workforce development and online learning (e.g., White House, 2009).

Policymakers have suggested that community colleges can play a substantial role in future economic development. If true, online learning provides access for various types of students to participate.

Organizational, Institutional, and Governance Issues in Online Learning

Findings regarding the relatively low number of colleges offering online workforce development programs raise questions about the various factors that impact program offerings. Piña (2008) found significant relationships among several variables affecting the decision to offer online programs, such as the academic level of the institution and its organizational design and structure, geographic location, and training or professional development opportunities for faculty. According to Piña's study, distance learning in two-year colleges was more likely to be managed through a centralized entity in the college. Rural institutions were found to be less likely to provide instructional design support, professional incentives, or professional development for online learning. These findings suggest that locale, institution type, and organizational design influence the implementation of online learning.

Using data from a broader study from 2000-2002, Cox (2005) found that six interrelated components determined the extent to which institutions offered online courses: (a) administrative commitment; (b) online student support services; (c) the availability of a full-time online coordinator; (d) internal/external financial and technological resources; (e) adequate faculty participation; and, (f) online professional development.. This current study builds on Cox's findings by considering larger contextual issues such as institutional and community factors affecting the offering of online occupational programs.

Individual community colleges' focus on economic and workforce development has impacted the way in which community colleges interact with local communities. However, the way in which this responsiveness has been manifested is largely dependent on structural and governance factors at the state level (Tollefson, 2000). Such structural factors include the degree of state community college centralization and the form of the community college governance system. For example, some states have a unified board that operates community colleges and universities; other states have loose coordinating bodies that have little control; and other states operate their community colleges through the state's land grant university system. These structures have a major role in determining how policy, funding, and curricular decisions are made.

Levin (1998) found that government influences and central administrative structures can lead to a perceived decrease in internal control over resources and curriculum. This perception can result in a narrowing of mission and lack of free agency. On the other hand a strong institutional culture can lead to entrepreneurialism and principled responses to external influences (Cox, 2005; Levin, 1998). Such decentralized arrangements can lead to increased responsiveness to local community and workforce development needs. Central administrative structures, however, can create scalability and equitable statewide distribution of resources (A. M. Cohen & Brawer, 2003). Central governance structures can also lead to greater accountability, which could also contribute to a more direct linkage with workforce development needs.

Conceptual Framework

Astley and Van de Ven (1983) explained that organizations can be viewed along two analytical dimensions: the level at which institutions respond to stimuli (i.e., micro/macro) and the degree of agency (i.e., determinist versus voluntaristic approaches to human nature).. The first dimension relates to whether organizations exist and respond to stimuli at the *macro level* (as groups of organizations) or *micro level* (as individual organizations). The second dimension addresses whether organizations possess agency and function in *deterministic* or *voluntaristic* ways. A deterministic orientation reflects the view that behavior is determined through reactions to structures and constraints that control and stabilize the system. A voluntaristic orientation reflects the view that individuals and organizations are “autonomous, proactive, self-directing agents” (Astley & Van de Ven, 1983, p. 247). As originally adapted to community colleges by Ghosh and Githens (2011), a version of their meta-framework is presented in a four-quadrant model that provides four views of organizations (see Figure 1):

- Proactive: If organizations exist primarily as *individual entities* (micro perspective) functioning *voluntaristically*, then they “are continuously constructed, sustained, and changed by actors’ definitions of the situation” (p. 249). In such cases, both the environment and the organization can be changed through stakeholders’ (i.e., “actors”) political negotiation.
- Reactive: If organizations exist primarily as *individual entities* (micro perspective) responding in a *deterministic manner*, then “organizational behavior is...shaped by a series of impersonal mechanisms that act as external constraints on the actors” (p. 248). In such a system, change means adapting to external influences in a technical manner at a local level.
- Inactive: If *total populations* (macro perspective) of organizations are responsive as groups and respond in a *deterministic manner*, then individual organizations either “‘fit’ into a niche or are ‘selected out’ and fail” (p. 250). In such a system, there are limits to the degree of choice that can be exercised when faced with external influences and change occurs at a broad level.
- Interactive: If organizations *collectively exist* (macro perspective) and *voluntaristically* collaborate, they “mediate the effects of the natural environment” (p. 251). In such cases, negotiation, conflict, and compromise result in organizations having symbiotic relationships and changing each other.

These four perspectives are not mutually exclusive; instead, tensions manifest themselves between the four emphases. Although the metaframework focuses on organizations, Astley and Van de Ven (1983) encourage its use when considering the interactions of individuals and groups within organizations and within populations of organizations. This lens helps to integrate issues related to organization design and workforce/economic factors by considering both internal and external stimuli and by considering the degree of agency that can be exercised by institutions, programs, and individuals. Figure 1 inserts the study’s dimensions into this framework.

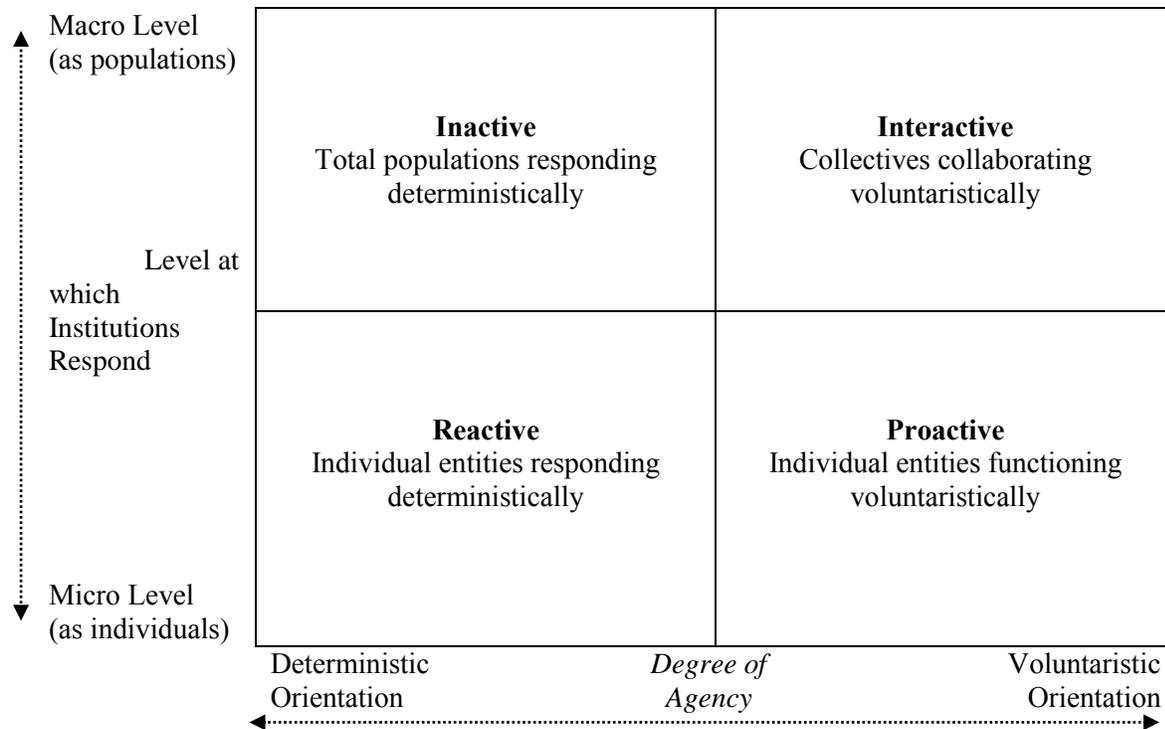


FIGURE 1. Organizational perspectives for community colleges. Adapted from Astley and Van de Ven (1983) and Ghosh and Githens (2011).

This framework was used as a broad conceptual lens for interpreting the data. Using this multidimensional lens, we consider various issues in determining the variables influencing the offering of online occupational programs, such as:

- The effect of *institutional governance* structure on the offering of online occupational programs. For example, an institution that operates under a statewide administrative structure might be more likely to respond to economic and workforce needs on a micro level. On the other hand, a locally governed institution with its own board and minimal accountability to state authorities would be more likely to respond on the micro level.
- The effect of *state and local social and economic variables* on offering online programs. For example, institutions in communities with a high unemployment rate might have an increased level of expectation that higher education institutions should contribute to local economic development compared with institutions in areas with low unemployment. The increased level of expectation might result in increased scrutiny and responsiveness on the part of the institutions which could result in either a reactive response (deterministic orientation) or proactive stance (voluntaristic orientation) to address those problems.

As will be seen in our findings and conclusion sections, this conceptual lens helped to consider whether state and local variables, or institutional variables predict whether online programs are offered.

Study Design

Our research questions were answered by compiling a database of online occupational programs and institutional characteristics for a sample of 321 community colleges. Data on state

characteristics, institutional characteristics, and program offerings were gathered by mining institutional websites, local, state, and federal databases and reports, and national community college databases. Additionally, individual colleges were contacted directly when data could not be obtained through other sources. Figure 2 depicts the levels being considered in this study and the relation to the study's conceptual framework.

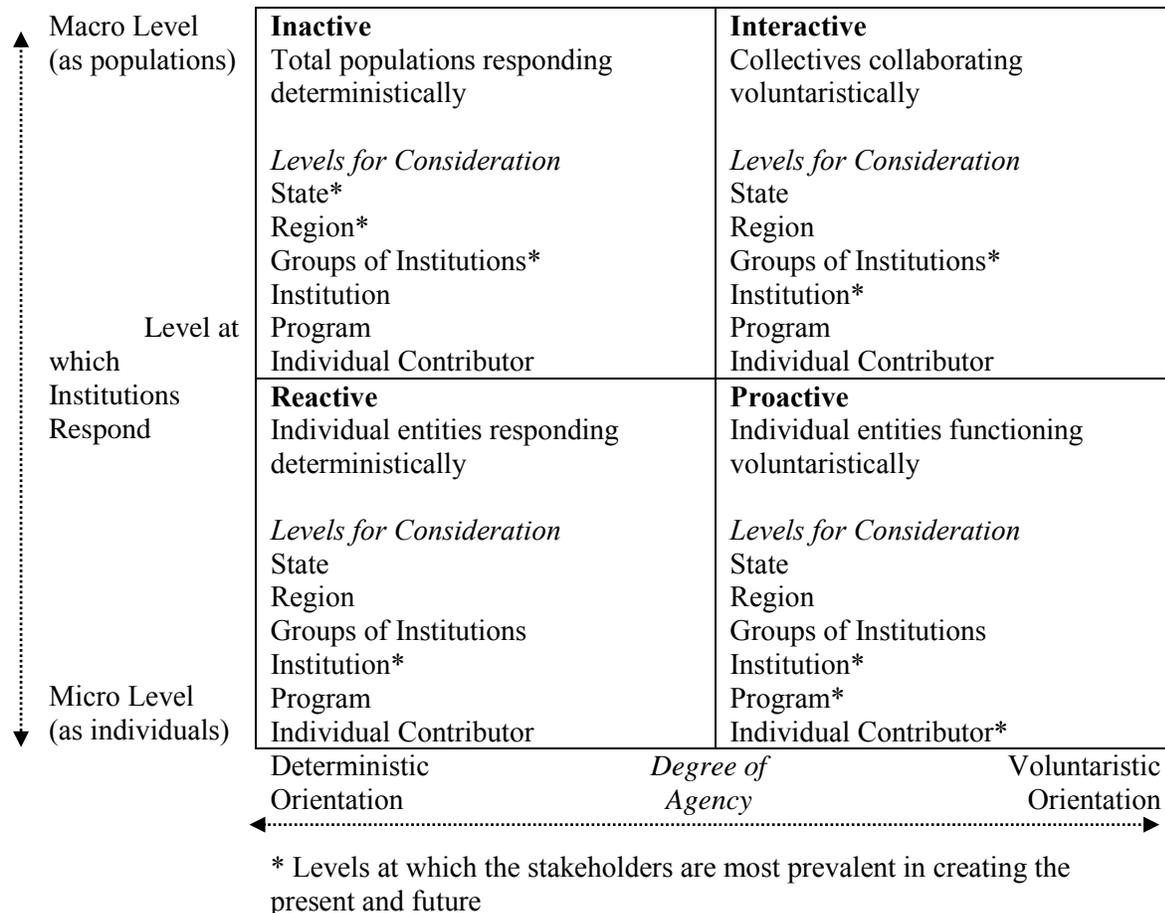


FIGURE 2. Organizational perspectives for online occupational programs. Adapted from Astley and Van de Ven (1983) and Ghosh and Githens (2011).

Sampling Strategy

The sampling procedure replicates parts of the procedure used in the Johnson et al. (2003) study examining the prevalence of online occupational courses in community colleges. The target population consisted of the 1,081 member institutions of the American Association of Community Colleges (AACC; i.e., community colleges, technical institutes, junior colleges). This AACC population consists of single-campus colleges, multi-campus colleges, and colleges that are affiliated with a university. For the sample, 321 institutions were randomly selected to participate in order to achieve a confidence level of 95% and a confidence interval of 4.59. Complete data were available for 301 colleges.

This study focuses on *online education*, which describes a specific medium through which *distance education* is offered. Distance education is a broader concept that encompasses “all forms of education in which all or most of the teaching is conducted in a different space than

the learning, with the effect that all or most of the communication between teachers and learners is through a communications technology” (Moore, 2003, p. xiv). Programs were considered “online” if face-to-face instruction was reduced or eliminated by 50% or more as a result of online communication technologies. In other words, programs that include hybrid courses were included if they incorporate a small amount of on-campus or face-to-face lab work, which is similar to the scope of similar studies (Johnson et al., 2003; Waits & Lewis, 2003).

This study encompasses the overlapping realms of career and technical education, occupational education, and workforce development. Historically, workforce development was a broader term that encompasses the wide variety of work-related education that occurs in community colleges (Gray & Herr, 1998; J. Jacobs & Dougherty, 2006; R. L. Jacobs, 2006). However, usage seems to be converging among policy makers, politicians, and in community colleges. Due to data gathering limitations, this phase of the project (reports of second phases is in preparation) encompassed only credit-granting degree/certificate programs. Included programs were limited to *occupational programs*, as defined and classified in a National Center for Education Statistics (NCES) study (Phelps & Greene, 2001). The NCES study defined an occupational program as “a sequence of courses designed to prepare students for an occupation (e.g., nurses’ aide) that typically requires education below the baccalaureate level” (Phelps & Greene, 2001, p. A-7).

Instrumentation

Our database was compiled of institutional characteristics, social and economic characteristics of the county where the institution was located, and online occupational program offerings. Data were collected through national and statewide databases, institutional websites, and direct inquiries to community colleges.

The institutional, social, and economic data were gathered from several archival database sources including: AACC, NCES Integrated Postsecondary Education Data System (IPEDS), U.S. Census Bureau, U.S. Bureau of Labor Statistics, and U.S. Bureau of Economic Analysis. Online occupational program data were collected from state/district level virtual campus or online consortium websites, individual institution websites, and telephone/email correspondence with institutional admissions, curriculum, advising, and online learning staff. Table 1 provides a comprehensive list of variables and data sources used.

The classification of state governance structure and degree of state centralization came from Lovell and Trough’s (2004) research in which each state’s system was classified according to the specific state governance model and according to the degree of statewide centralization. First, in order to understand the structure of community colleges and the state agencies to which they report, Lovell and Trough (2004) incorporated Tollefson’s (2000) classification of governance. Using this, each state was placed into the following categories (see Table 2).

Validity and Reliability

The most current social and economic data were collected from reputable national archival databases. In every instance, the data were collected from a single source, thus reducing possible measurement error due to confounding sources. Program-level data were collected from state/district virtual campus and online consortium websites, individual academic institution websites, and telephone/email inquiries with institutions. Online occupational program data came from self-identified data, meaning this study was interested in the existence of institutionally

Table 1
Database Variables and Sources

Variable/Variable Category	Source
<i>Institutional Level Variables</i>	
Institution Name	American Association of Community Colleges (2009)
Institution City/State	American Association of Community Colleges (2009)
Institution County	National Association of Counties (2009)
Institution Locale (city/suburb/town/rural)	Integrated Postsecondary Education Data System: College Navigator (2006-2007)
Institutional Student Demographics ¹	Integrated Postsecondary Education Data System: College Navigator (2006-2007)
Governance Model	Inventory of Statewide Community College Governance Structures (Lovell & Trough, 2004)
Degree of Centralization	Inventory of Statewide Community College Governance Structures (Lovell & Trough, 2004)
<i>County Level Social & Economic Variables</i>	
Per Capita Income	U.S. Bureau of Economic Analysis: Regional Economic Accounts (1996-2006)
Median Household Income	U.S. Bureau of Labor Statistics: Data Sets (2007)
Unemployment Rate	U.S. Bureau of Labor Statistics: Data Sets (2007)
% High School or higher (25 or older)	U.S. Census Bureau: State & County QuickFacts (2005-2007)
% Bachelors or higher (25 or older)	U.S. Census Bureau: State & County QuickFacts (2005-2007)
Median Age	U.S. Census Bureau: State & County QuickFacts (2005-2007)
<i>State Level Social & Economic Variables</i>	
Five Fastest Growing Occupations (by State)	U.S. Department of Labor: CareerOneStop (2006-2016 projections)
Top 10 Occupations with the Most Openings (by State)	U.S. Department of Labor: CareerOneStop (2006-2016 projections)
Economic Growth (% Change in real state GDP by state)	U.S. Bureau of Economic Analysis: Regional Economic Accounts (2006-2007)
<i>Online Occupational Program Variables</i>	

¹ Part-time student status, race, gender, nonresident alien status, institution student population, full-time first-time student retention rate, part-time first-time student retention rate.

Online Occupational Program Offerings	State/district level websites, individual institution websites, communication with institutions
Degree/Certificate/Diploma status of program ²	State/district level websites, individual institution websites, communication with institutions

Table 2
State-Level Community College Structures³

State Board with Responsibility for Community Colleges	Description	Percentage of States (%)
State Board of Education	Oversees community colleges and K-12 systems in a general sense. Most control left to local institutions and boards.	12
State Higher Education Board or Commission	Exercises influence over state universities and community colleges by approving programs and recommending annual budget priorities to the legislatures. Usually found in states with local boards.	20
State Community College Coordinating Board	Holds moderate control over community colleges, particularly concerning finances and academic operations.	22
State Community College Governing Board	Oversees most community college operations, including employment of faculty, staff, and administrators; approving academic programs and budgets; establishing systemwide employment, salary, and benefit policies; and ownership of local colleges' physical plants.	12
State Board of Regents	Similar to a State Community College Governing Board, but also governs state universities.	28
Multiple Systems	States that utilize more than one structure for multiple systems.	6

² Programs that offered more than one degree type (e.g., an institution that offers both a Certificate and an Associate of Applied Science in Web and Digital Communications) were counted once for each degree/certificate type.

³ Classification scheme taken from Lovell and Trough (2004)

identified online programs (rather than groups of online courses not identified by the institution as an online program).

Next, Lovell and Trough (2004) added Garrett's (1999) measure of degree of statewide centralization to their taxonomy. Garrett's approach classified the degree to which individual state systems were centralized or decentralized in order to depict the degree of local control. Each college in our sample was placed into one of the levels on that continuum (see Table 3) based upon the ways states performed 29 functions within their community colleges (Garrett, 1999).

Table 3

*Degree of Statewide Centralization in Community College Systems*⁴

Degree of Centralization	Percentage of States (%)
Highly Centralized	10.2
Centralized	28.5
Moderately Centralized	10.2
Moderately Decentralized	24.4
Decentralized	22.4
Highly Decentralized	4

Data Analysis

Various analyses provided an understanding of the relationship between program offerings and institutional characteristics (e.g., institutional, social, and economic indicators). Table 4 contains the analyses conducted in the study.

Limitations

There are several limitations of this study. The number of online programs included in this sample was limited to programs in which (a) the institution identified them as being "online programs" and (b) 50% or more of the program requirements could be fulfilled online. We excluded programs where students could piece together an online option by finding online courses that would meet degree requirements but were not part of a coherent online program offering. Such makeshift programs were not included in the sample for two reasons. First, it was important to only count programs that clearly indicated that they were online for potential students. Second, there would have been various reliability issues in the data collection process if we had not limited inclusion to self-identified online programs. For example, among programs that were not identified by the institution as being available online, we would not have been able to determine whether enough online courses existed to take 50% or more of the requirements online because this information was not readily available or even known at by institutional leaders. Additionally, we measured the number of online occupational programs per 10,000 students rather than the percentage of occupational programs offered online at each institution. While the percentage would provide a weighted comparison between institutions with varying number of occupational programs, it would not have accounted for programs that offer specialized online certificates under one program umbrella. For example, if an information technology program offers one certificate face-to-face only and two additional certificates only in the online format, issues arose as to whether the information technology "program" would be

⁴ Using Garrett's (1999) classification scheme.

Table 4
Analysis Techniques Used in the Study

Research Question	Analysis Description	Analysis Type	Independent Variable(s)	Dependent Variable(s)
1	Determining whether there is a difference in community and institutional demographics among those institutions offering online occupational programs and those that do not	MANOVA	Has online occupational programs; Does not have online occupational programs	Institutional, social, and economic indicators
2	Influence of governance models on the number of online occupational programs	ANOVA	Community college governance model	Number of online occupational programs per 10,000 students
3	Influence of degree of statewide centralization	ANOVA	Degree of statewide community college centralization	Number of online occupational programs per 10,000 students

counted as one program or three programs. Therefore, to increase data reliability and simplicity, online programs were simply counted rather than considered as a percentage of total programs.

Another set of methodological concerns relates to the institutional, economic, and social indicators included in the study. Most institutional data are limited to those data included in IPEDS. Although IPEDS is a standard database used by higher education researchers, its reliability can be limited because the data are compiled by hundreds of institutional researchers at various institutions. Next, when using secondary data sources, errors in the aggregation and interpretation of data may occur because the analysts were not involved in the planning or collection of data (Church, 2002). The last concern relates to economic and social indicators based upon the county in which the main campus of institution was located. Because rural and suburban community colleges often serve multiple counties and urban community colleges sometimes serve only small portions of counties, these data do not perfectly reflect the communities that these institutions serve.

Findings

Profile of Sample Institutions

Data were available for 301 colleges, of which 47.5% ($n = 143$) offered online occupational programs. The 143 colleges that provide online occupational programs offer 1,201 individual programs with a mean of 8.6 (Mdn = 5, $SD = 10.3$, Range from 1 to 59) online occupational programs per college. Forty-five states were represented in the random sample as well as one independent island nation, Palau, associated with the United States. The institutions represent the entire spectrum of the 12 locale types, with the highest frequencies being “rural: fringe” (17.7%), “suburb: large” (14.7%), and “city: small” (14.3%) locales. Tables 5 and 6 display the community college governance structures and degree of centralization represented in the sample.

Table 5

Community College Governance Structures for Sample ($N = 301^5$)

State Governance Model	<i>N</i>	%
State Board of Education	26	8.7
State Higher Education Board or Commission	68	22.7
State Community College Coordinating Board	112	37.3
State Community College Governing Board	32	10.7
State Board of Regents	48	16
Multiple structures in state	14	4.7

Table 6

Degree of Centralization for Sample Institutions

Degree of Centralization	<i>N</i>	%
Highly Centralized	20	6.7
Centralized	52	17.3
Moderately Centralized	44	14.7
Moderately Decentralized	109	36.3
Decentralized	69	23.0
Highly Decentralized	6	2.0

Of institutions in the sample, the average student enrollment was 7,689 students with the majority of students enrolled part time (58.7%), female (59.7%) and White (64.6%). The overall retention rate for first-year students was considerably higher for full-time students (57.6%) than part-time students (40.8%). The average median age for the county in which the college resides was 36.1, slightly higher than the national median age of 35.3 (U.S. Census Bureau, 2000). Educational attainment for the areas in which the institutions are located was slightly less than

⁵ There were incomplete data for one institution residing in an independent island nation.

national averages. The percentage of the population with a high school diploma or higher (25 years and older) was 80% compared to the national rate of 80.3%. The percentage of the population with a bachelor's degree or higher (25 years and older) was 22% compared to the national rate of 24.4% (U.S. Census Bureau, 2000).

Community and Institutional Demographics

In order to determine if there was a difference between institutional, social, and economic characteristics of colleges offering online occupational programs and those that do not, a multivariate analysis of variance (MANOVA) was conducted. The sample population of colleges was disaggregated into a dichotomous grouping variable to include colleges that offer online occupational programs ($n = 143$) and colleges that do not offer online occupational programs ($n = 158$). A MANOVA was performed with offering of online occupational programs as the independent variable and the 22 institutional, economic, and social indicators as the dependent variables. The MANOVA removed cases that had missing data on any of the 23 institutional, economic, and social variables, resulting in an analysis of 294 colleges (98% of the sample). It was hypothesized that there would be a significant group difference between schools that offer online occupational programs and those that do not, based on the institutional, social, and economic indicators. Table 7 provides descriptive statistics for institutional, social, and economic factors examined in the study.

The MANOVA was statistically significant.⁶ Nineteen percent of the variance in the dependent variables was explained by the grouping variable, presence/absence of online occupational programs.⁷ According to Cohen (1988), this is a large effect. The univariate tests revealed significant group difference in the percentage of White students in the college population, $F(1,292) = 25.42, p = .000$, and the percentage of Asian/Pacific Islander students in the college population, $F(1,292) = 15.93, p = .000$.⁸ The partial η^2 statistic revealed that 8% of the variance in the percentage of White students was explained by the presence/absence of online occupational programs. This is considered a medium sized effect (Cohen, 1988). Similarly, partial η^2 revealed that 5% of the variance in the percentage of Asian/Pacific students was explained by the presence/absence of online occupational programs. This is classified as a small effect (J. Cohen, 1988).

The colleges in the sample that offer online occupational programs had a significantly higher percentage of White students (71.5%) than those schools that did not offer online occupational programs (58.4%). Additionally, schools that offer online occupational programs had a significantly lower percentage of Asian/Pacific Islander students (2.4%) than those schools that did not (7.2%).

⁶ Hotelling's Trace = .235, $F(22,271) = 2.90, p = .000$.

⁷ $\eta^2 = .19$.

⁸ Because of the large number of dependent variables (22), a corrected alpha level of .002 was used for the tests of univariate effects (Stevens, 2001).

Table 7
Descriptive Statistics by Offering of Online Occupational Programs

	Has online occupational program offerings			
	Yes (<i>n</i> = 140)		No (<i>n</i> = 154)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
State: Average annual economic growth rate (1996-2006)	5.00%	1.09	5.20%	1.25
County: Median household income (2007)	47,918.69	13,339.87	50,382.18	13,193.26
State: Economic growth (percent change in real state GDP by state, 2006-2007)	2.17%	1.34	1.88%	1.29
County: Unemployment rate (2007 annual)	4.76%	1.31	4.76%	1.44
County: Median age (2000)	35.96	3.40	36.22	3.42
County: Percent high school or higher (25 or older; 2000)	80.20%	7.84	79.61%	6.77
County: Percent Bachelors or higher (25 or older; 2000)	21.25%	9.14	22.61%	9.07
County: Percent in labor force (16 and older; 2000)	63.93%	6.39	62.07%	5.56
College: Institution student enrollment	8122.49	15,338.03 ⁹	7136.36	7222.37
College: Percent full-time	41.13%	11.23	40.69%	12.35
College: Percent part-time	58.84%	11.24	59.24%	12.30
College: Percent male (Fall 2007)	40.80%	6.94	39.87%	7.95
College: Percent female (Fall 2007)	59.20%	6.94	60.13%	7.95
College: Percent White (Fall 2007)	71.45%	19.21	58.44%	24.42
College: Percent Black (Fall 2007)	10.91%	12.02	13.79%	15.44
College: Percent Hispanic (Fall 2007)	7.59%	14.05	12.65%	15.92
College: Percent Asian/Pacific Islander (Fall 2007)	2.41%	3.02	7.23%	13.97
College: Percent American Indian/Alaskan (Fall 2007)	1.39%	3.96	1.14%	3.62
College: Percent unknown race (Fall 2007)	5.35%	6.32	5.49%	6.38
College: Percent nonresident alien (Fall 2007)	0.81%	1.52	1.03%	1.78
College: Percent full-time first-time student retention	57.77%	10.01	57.19%	10.75

⁹ The large amount of variance can be explained by the presence of an outlier (population of 168,881). Removal of the outlier results in a decrease in the descriptive statistics (*M* = 7,210.87, *SD* = 4,851).

	Has online occupational program offerings			
	Yes (<i>n</i> = 140)		No (<i>n</i> = 154)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
State: Average annual economic growth rate (1996-2006)	5.00%	1.09	5.20%	1.25
County: Median household income (2007)	47,918.69	13,339.87	50,382.18	13,193.26
State: Economic growth (percent change in real state GDP by state, 2006-2007)	2.17%	1.34	1.88%	1.29
County: Unemployment rate (2007 annual)	4.76%	1.31	4.76%	1.44
County: Median age (2000)	35.96	3.40	36.22	3.42
County: Percent high school or higher (25 or older; 2000)	80.20%	7.84	79.61%	6.77
County: Percent Bachelors or higher (25 or older; 2000)	21.25%	9.14	22.61%	9.07
County: Percent in labor force (16 and older; 2000)	63.93%	6.39	62.07%	5.56
College: Institution student enrollment	8122.49	15,338.03 ⁹	7136.36	7222.37
College: Percent full-time	41.13%	11.23	40.69%	12.35
College: Percent part-time	58.84%	11.24	59.24%	12.30
College: Percent male (Fall 2007)	40.80%	6.94	39.87%	7.95
College: Percent female (Fall 2007)	59.20%	6.94	60.13%	7.95
College: Percent White (Fall 2007)	71.45%	19.21	58.44%	24.42
College: Percent Black (Fall 2007)	10.91%	12.02	13.79%	15.44
College: Percent Hispanic (Fall 2007)	7.59%	14.05	12.65%	15.92
College: Percent Asian/Pacific Islander (Fall 2007)	2.41%	3.02	7.23%	13.97
College: Percent American Indian/Alaskan (Fall 2007)	1.39%	3.96	1.14%	3.62
College: Percent unknown race (Fall 2007)	5.35%	6.32	5.49%	6.38
College: Percent nonresident alien (Fall 2007)	0.81%	1.52	1.03%	1.78
College: Percent full-time first-time student retention	57.77%	10.01	57.19%	10.75
College: Percent part-time first-time student retention	41.26%	12.68	40.31%	14.20

Influence of Governance Models

The analysis revealed significant relationships between governance models and the number of online occupational programs offered per 10,000 students at institutions. Table 8 depicts descriptive statistics regarding the average number of online occupational programs offered per 10,000 students, by governance model. A one-way between-subjects ANOVA was conducted to examine the effect of the state governance model on the number of online occupational program offerings. Results indicated that there was a significant effect of state governance model on the number of online occupational program offered per 10,000 students at the .05 alpha level across five levels of state community college governance, $F(4, 281) = 6.83$, $p < .001$. About 9% of the variance in the number of online occupational programs offered per 10,000 students was explained by the state community college governance model.¹⁰ According to Cohen (1988), this is a medium effect.

Table 8

Average Number of Programs per 10,000 Students at Each Institution by Governance Model¹¹

State Governance Model	<i>M</i>	<i>SD</i>	Number of Institutions
State Board of Education	7.47	13.21	26
State Higher Education Board or Commission	5.82	11.32	68
State Community College Coordinating Board	6.04	17.40	112
State Community College Governing Board	34.80	47.88	32
State Board of Regents	23.75	64.30	48

Post hoc comparisons using the Tukey HSD test indicated that the mean score (number of online occupational programs offered per 10,000 students) for State Community College Governing Board ($M = 34.80$, $SD = 47.88$) was significantly higher than State Board of Education ($M = 7.47$, $SD = 13.21$), State Higher Education Board or Commission ($M = 5.82$, $SD = 11.32$) and State Community College Coordinating Board ($M = 6.04$, $SD = 17.40$). The mean score for the State Board of Regents ($M = 23.75$, $SD = 64.30$) was significantly higher than State Higher Education Board or Commission ($M = 5.82$, $SD = 11.32$) and State Community College Coordinating Board ($M = 6.04$, $SD = 17.40$).

State Community College Governing Boards and State Boards of Regents are similar in that each oversees most community college operations, including employment, approving academic programs and budgets, establishing systemwide employment, salary, and benefit policies, and holding ownership of local colleges' physical plants. The primary difference is that State Boards of Regents oversee both community colleges and state universities.

Influence of Degree of Centralization

The analysis revealed significant relationships between degree of statewide centralization and the number of online occupational programs offered per 10,000 students at institutions. Table 9 depicts descriptive statistics regarding the average number of online occupational programs offered per 10,000 students, by degree of centralization. A one-way between subjects

¹⁰ $\eta^2 = .089$.

¹¹ Fourteen colleges were in states with multiple governance structures and were not included in the analysis.

ANOVA was conducted to examine the effect of degree of statewide centralization on the number of online occupational programs offered per 10,000 students at institutions. This analysis measured the relationship between the number of online occupational programs per 10,000 students and the degree of local institutional control. Results indicated that there was a significant relationship between the degree of centralization and the number of online occupational program offerings per 10,000 students at the .05 alpha level across the six levels of degree of centralization, $F(5, 294) = 2.76, p = .000$. About 5% of the variance in the number of online occupational programs offered per 10,000 students was explained by the degree of centralization.¹² According to Cohen (1988), this is a small effect.

Table 9

Average Number of Programs per 10,000 Students at Each Institution by Degree of Centralization

Degree of Centralization	<i>M</i>	<i>SD</i>	Number of Institutions
Highly Centralized	32.06	38.73	20
Centralized	20.53	44.16	52
Moderately Centralized	11.68	25.58	44
Moderately Decentralized	8.00	38.41	109
Decentralized	7.02	14.29	69
Highly Decentralized	6.73	6.69	6

Post hoc comparisons using the Tukey HSD test indicated that the mean score (number of estimated online occupational programs per 10,000 students) for highly centralized institutions (M = 32.06, SD = 38.73) was significantly higher than the moderately decentralized (M = 8.00, SD = 38.41) and decentralized (M = 7.02, SD = 14.29) institutions.

Conclusions and Implications for Policy and Practice

This study expands theoretical and practical knowledge about the interaction between institutional governance, degree of statewide centralization, and social factors predicting the offering of online occupational programs. In this section, we interpret key findings, consider their intersection with the study's theoretical framework, and connect them with policy and practice implications.

Governance

Institutions with a State Community College Governing Board and State Board of Regents model has significantly more online occupational programs per 10,000 students than institutions using other governance models. This finding suggests that a statewide governance model may foster or require the development of online occupational programs more effectively than other types of governance. Two possible financial reasons exist for this finding. First, it is possible that states with these models more equitably distribute funds, which enables more colleges to invest in online programs. Second, a more tightly controlled financial system could

¹² $\eta^2 = .045$.

enable central office administrators to effectively encourage local colleges to mirror the central office priorities at the local institutions. In considering the study's conceptual framework, state systems act proactively when making the strategic choice to emphasize online occupational programs, which might enable innovators to easily access resources for developing online programs.

In some states using a state governance approach, online program approval is facilitated through a statewide office dedicated to creating online learning opportunities throughout the statewide community college system (e.g., Olson, 2006; Olson & Langer, 2004). For example, Minnesota Online remains as the statewide office that promotes and encourages online learning opportunities within the institutions encompassing the Minnesota State Colleges and Universities system, which is a State Board of Regents system. Such approaches have fared better in the long term than statewide consortia, often known as virtual campuses or virtual universities. Statewide consortia are interactive, collective organizational approaches that arose in the late 1990s when both states and institutions were eager to create and expand online learning opportunities (Garn, 2009; Hiltz & Goldman, 2005). Such arrangements allowed for resource sharing, collaboration among institutions, and funding opportunities for online program development. However, many of these arrangements have faced sustainability problems. Garn (2009) concluded that these initiatives have been more sustainable when embedded within particular statewide governance systems (e.g., the statewide system in Minnesota), due to these systems' more reliable funding streams.

Another important implication relates to the more centralized state governance structures offering mechanisms for centralized promotion of online programs. Although most community colleges offer online occupational courses, less than half offer online occupational programs. Statewide mechanisms can create opportunities, incentives, or pressure for institutions to promote individual online courses as being part of larger online programs. In our sample, we found that some institutions reported having no online programs, but upon investigating further on their websites, one could piece together enough online courses to allow a student to take 50% or more of the courses online. This lack of organized online promotion creates barriers for students who do not realize that the programs may be offered in an online format. Considering the study's conceptual framework, centralized promotion efforts allow the state system to proactively encourage online program development. This avoids students having to piece together an online program, which remains invisible to external audiences.

Centralization

Institutions with highly centralized state governance had significantly more online occupational programs per 10,000 students than most institutions operating in moderately decentralized and decentralized systems. When considering why the highly centralized institutions had so many more programs, it is important to note that Kentucky has a unique and innovative arrangement. Online programs at all community colleges in the state are offered as online programs at any other community college in the state, as long as the home institution offers that program in the face-to-face format. For example, College X could offer an online Criminal Justice program, whereas College Y offers that program only in a face-to-face format. A student could be admitted to and register through College Y, but take up to 75% of their courses online through College X. That student could earn their degree from their local institution, College Y, as long as 25% of the courses are taken at the local college. Because Kentucky has a highly centralized administrative structure, all community college courses are

visible to students when they register. Tuition is the same for all state residents at any community college. This arrangement allows each institution in Kentucky to have a higher number of online programs than many other institutions in the sample. This example creates a strong case for centralized administrative systems creating greater access to online occupational programs. Considering this case through the lens of the conceptual model, more highly centralized systems take a proactive approach by designing administrative mechanisms that provide greater access to students. However, colleges in less centralized states can and have designed similar course-sharing arrangements among community colleges, which can create greater access to online courses. State-level community college associations, coordinating boards, and other agencies can encourage interactive collaboration between multiple colleges and increase statewide access to online courses.

Some of the findings, however, complicate the case for highly centralized governance being the optimal approach for promoting online program development. For example, the highly decentralized institutional model did not have a significantly fewer number of online programs per 10,000 students when compared to the highly centralized model. In contrast, as mentioned before, there was a significant difference between institutions in the highly centralized states and those in moderately decentralized and decentralized states. Additionally, the individual institution with the most programs per 10,000 students existed within a moderately decentralized system, as did the college with the fifth most programs. In fact, only three of the colleges in the top 10 online program offerings per 10,000 students were colleges operating under a highly centralized governance model. These findings provide a counter-argument to any claims that online occupational programs need centralized state governance in order to flourish. It would seem that individual institutions can exercise their own agency in either reacting to local needs or being proactive in their approach to online education. Individual decentralized institutions can also proactively create environments where these online programs flourish. This finding suggests the possibility that proactive, strategic development of online programs can occur through local conditions unrelated to degree of centralization. On the whole, there appears to be some characteristic(s) associated with highly centralized governance and statewide governance that leads to more widespread access to online learning across a state. Colleges might create these programs under statewide mandates, incentives, or structures in which the system proactively creates conditions under which local institutions react.

Community and Institutional Demographics

Online occupational programs are more likely to exist in community colleges with higher percentages of white students. That finding is not consistent with overall distance education enrollment patterns. Data from two NCES surveys found that participation in distance education was comparable among racial groups (Flowers, Moore, & Flowers, 2008; Hudson & Shafer, 2003). It is difficult to know whether the discrepancy in program offerings in this study is due to lack of technology access at colleges with higher numbers of students of color, colleges in predominantly rural areas (with higher percentages of white students) having more emphasis on online learning due to geographic constraints, or financial inequities among colleges having lower percentages of White students. Additional research is necessary to understand why institutions with higher percentages of students of color are less likely to offer online occupational programs. This finding has potentially important implications for policies at the federal, state, and institutional levels due to possible inequities in college access.

Aside from the racial variables, no other significant relationships were found regarding the institutional, social, and economic indicators and the likelihood of offering online occupational programs. Surprisingly, institutional enrollment was not a significant predictor of whether colleges offered online programs. One might assume that larger institutions would have more resources, which would make them more likely to offer online occupational programs. Perhaps that obstacle is counterbalanced by smaller institutions that serve larger, rural geographic areas or want to increase enrollment beyond their traditional service areas. Additionally, economic conditions in institutions' communities failed to predict whether colleges offered online occupational programs. Excluding racial demographics, these findings suggest that institutions are largely shaped proactively (at the micro level) by internal factors or structural conditions, rather than by deterministic forces over which the institution has little control (e.g., institutional demographics, local economic conditions).

Relevance to Policy, Practice, and Future Research

This study provides institutions and policymakers with national data to consider in making decisions about how to promote the growth of online learning within institutions. As institutions consider how to best provide access to current and potential students, many also face severe space shortages (Gonzalez, 2009; Jaschik, 2009). Furthermore, the ability to serve a wider audience with workforce development efforts is needed in an economy that is recovering. Understanding how an institution's current governance process, level of centralization and institutional demographics may facilitate or impeded online program initiatives is a necessary step before attempting to recommend change. Using the typology tool (presented as the conceptual framework) could help institutions discover what steps to take should online programming be a strategy they wish to employ.

Furthermore, those institutions in decentralized contexts and those with high percentages of students of color will find the results of this study useful. The findings will allow leaders in those institutions national data to convince policymakers why certain strategies need to be adopted if online program development is the objective. Additionally, it can help such institutions see the possible artificial barriers they might be creating for students by not promoting coherent online and hybrid programs when such programs might exist without institutions making them known. With some coordination and marketing efforts, such programs can be promoted as online, which attracts students who cannot attend fully online programs, due to family, career, or other obligations.

Future investigation of online workforce programs could examine the degree institutions collaborate within the local community in developing such programs. Research can also examine how various types of governance systems can effectively foster online program development, in order to expand college access. In particular, in decentralized systems, how can institutions most effectively collaborate in a sustainable manner to increase online program access without duplicating resources? This study did not look at conditions for encouraging innovation or buy-in from faculty. Although other studies have found that administrative support is crucial in building widespread online programs (Cox, 2005), central office mandates can lead to resentment from faculty and reluctance to support distant administrators perceived who can be perceived as removed from the needs of the local communities (A. M. Cohen & Brawer, 2008; Levin, 1998). Another important question addresses which types of governance systems and leadership approaches can foster the *highest quality* online programs. Finally, as students from online workforce development programs begin to populate the workforce, how is their

performance perceived by employers? Additional research will continue to provide more evidence for policy makers and college leaders in increasing access to workforce development through online education.

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