

## **Distance Education Programming Barriers in Business Education Teacher Preparation Programs in the United States**

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### **Abstract**

*Distance education has been viewed by some individuals as a means to break down barriers to accessing educational opportunities. Despite its “anytime, anyplace” label, distance education can present unique barriers to students, faculty, and the educational institutions that attempt to provide it. This study examined the perceptions of business education teacher educators in the United States with respect to these barriers. The study also sought to determine demographic characteristics of the educational institutions involved in the utilization of distance education in business education teacher preparation, including the number of distance education courses, programs offered, and the categorical breakdown of those courses. While specifically focused on business education teacher preparation, the study offers findings and recommendations applicable to other subject areas within teacher preparation considering distance education as a delivery mechanism.*

### **Background**

#### **Business Education Defined**

The National Business Education Association describes business education as the career and technical program that prepares students for today's business environment (Brantley & Davis, 1997). In addition to providing employment training, business education also gives students personal business skills that help them function effectively as consumers and citizens. Business education programs can be found in a variety of settings, serving a diverse population of students. These settings include primary and middle schools; junior and senior high schools; postsecondary settings, such as two-year and four-year colleges and universities; and adult education centers. Graduates of business education programs are able to function as

economically literate citizens through the development of personal finance skills and an understanding of business operations. They should demonstrate the ability to work effectively in a multicultural team environment through the development of communication, leadership, and interpersonal skills; apply technology to solve personal and business problems; and demonstrate a desire to actively and perpetually acquire knowledge in order to solve personal and business problems (Missouri Department of Elementary and Secondary Education, Division of Vocational and Adult Education, 2000). Curricula for business education can vary from school to school. Table 1 outlines courses that are generally offered at the secondary level.

Table 1  
*Courses and Course Descriptions of Business Education Curricula*

Course	Course Description
Keyboard Applications	Enables students to develop and enhance their skills in entering alphabetic, numeric, and symbolic information on a keyboard
Computer Applications	Provides students with knowledge to gain skills in internet usage, word processing, database management, and spreadsheet applications
Introduction to Business	Designed to give students knowledge of how business operates in today's society
Desktop Publishing	Allows students to gain skills in operating desktop publishing software for the development of business publications
Computer Programming	Focuses on introductory skills in computer language, code, testing, monitoring, and debugging computer programs
Accounting	Concentrates on teaching students the basic understanding of manual and automated accounting principles and procedures, including topics such as accounting equations, the accounting cycle, posting to journals, and preparing end of statement reports
Business Law	Introduces the basic legal principles relevant to students' lives as consumers, citizens, and employers
International Business	Provides students with information on the global marketplace
Economics	Enables students to gain knowledge of economic principles in order to be competent citizens in a capitalistic society

Today's business environment is becoming increasingly global and reliant on information and computer technology. As a result, institutions have begun to offer

courses in e-business, computer technology, and multimedia. Additionally, business principles have changed from secretarial and office procedures to management and entrepreneurship procedures. This change has also had an impact on the curriculum, shifting courses from shorthand and clerical skills to management and entrepreneurship (Gordon, 2003).

### Distance Education Defined

The general term “distance education” is one of many terms used to describe any educational endeavor where the instructor and the students are separated by a physical distance (Christopher, 2004). The idea of distance education is not new, and has evolved with technology from written correspondence courses, to the use of television and radio, to computer technology. Today this term is almost exclusively used to describe the transmission of instruction from one location to multiple locations via telecommunication technology that is either synchronous (real time) or asynchronous (time delay). (Burgess, 2003; Smallwood & Zargari, 2000). As referenced in Table 2, this telecommunication technology has many forms.

Table 2

*Technology Utilized in Distance Education by Technological Category and Time Mode*

Technological Category	Time Mode	
	Synchronous	Asynchronous
Voice	Telephone and audio conferencing	Audiotapes and radio
Video	Real-time moving images with audio conferencing (one-way/two-way video with two-way audio)	Still images (slides), preproduced moving images (e.g., film, videotape)
Data (Computer Applications)	Electronic mail, fax, real-time computer conferencing, World-Wide Web applications, Internet relay chats (IRC)	Computer-managed instruction (CMI)
Print	Not applicable	Textbooks, study guides, workbooks, course syllabi, and case studies

(University of Idaho College of Engineering, 2006; Zirkle, 2003)

Additionally, Keegan (2002) argues that the next generation of distance education will utilize mobile technology as a means of transmitting instruction. Keegan described the move from wired computers and telephones to wireless ones.

This mobile technology includes wireless laptops, mobile telephones, PDA's, and palmtops.

## **Literature Review**

### **Benefits to Distance Education**

Continual technological advances have allowed the notion of distance education to move from the early days of correspondence courses delivered by postal mail to today's "anytime, anyplace" system of virtually on-demand courses delivered via satellite, the Internet, and videoconferencing. It is this technological change that has driven the growth in distance education and has prompted researchers to examine the potential benefits associated with distance education.

Zirkle (2003) outlined benefits to students, instructors, and educational institutions engaged in distance education. For students, the ability to access courses and programs without regard to place and time constraints was a primary benefit, along with the self-paced nature of many distance education offerings. These were especially important to working adults, who often have significant work and family responsibilities, and need flexible educational opportunities. Students with physical disabilities were also found to benefit advances in assistive technology that have improved access to distance education courses and programs.

Distance education offers faculty the opportunity to reach students perhaps previously inaccessible due to time and place constraints, and allows for the modeling of the effective use of technology in instruction, an important skill for faculty involved in teacher education (International Society for Technology in Education, 2002; National Council for Accreditation of Teacher Education, 2006). Distance education methodologies are also adaptable to diverse learning needs using audio, video, and printed material (Zirkle, 2003). Teacher education efforts in career and technical education have historically utilized the services of itinerant teacher educators at off-campus sites. Distance education offers these individuals a respite from traveling, leaving time available for more productive faculty purposes.

Educational institutions can also receive benefits from offering courses and programs through distance education. Enrollments can be increased by accessing the aforementioned group of previously unreachable students, and many distance education efforts are scalable, i.e., they can be offered to 10 or 10,000 students without significant expenses in physical facilities (Rosenberg, 2001). Distance education can also assist educational institutions with meeting standards for the use of technology. Professional education associations, such as the National Council for the Teachers of Mathematics, and accrediting groups, such as the National Council for the Accreditation of Teacher Education, all specifically mention the use of technology in their program standards (Zirkle, 2003).

### **Institutional Barriers**

Numerous studies have addressed the barriers to implementation of distance education from the institutional perspective. Several researchers (Berge, 2002; Johnson & Benson, 2003; VanDusen, 2000; Zenger & Uehlein, 2001) have identified costs associated with program development, implementation, and maintenance as potential barriers to program implementation. Garland (1993) and Yap (1996) also added resource availability, scheduling, and technical support to the list of barriers. Additionally, the slow pace at which institutional change occurs, and an institution's philosophy are also cited as barriers (Levine & Sun, 2002).

### **Faculty/Instructional Barriers**

Barriers to implementation of distance education also exist at the faculty/instructional level. These include the lack of non-verbal communication, which is a characteristic of distance education (Smith, 2002), the increase in workload for the instructor (Birnbaum, 2002; Christopher, 2004; Picciano, 2001; Smith, 2002; Young 2002), and the issue of logistics in testing and assessment (Christopher, 2004). The ability to teach technical, psychomotor skills through distance methods has been questioned by several researchers (Fann & Lewis, 2001; Miller & Webster, 1997; Zirkle, 2002; 2004). Additionally, Berge (2002) listed copyright issues, and the fact that some faculty members fear that technology may pose a threat to their job security. Smith (2002) also cited a lack of training and technical support as instructional barriers. Finally, the lack of incentives, financial and otherwise, for instructors to participate in distance education has been investigated (Franklin & Kaufman, 1999; Lynch & Corry, 1998; Picciano, 2001; Wolcott, 1999).

### **Student/Learner Barriers**

The feeling of isolation that can potentially occur in distance education is well documented (Abrahamson, 1998; Berge, 2002; Kerka, 1996; Smith, 2002). There are also questions of access and the technological literacy of the students, which are explored by Smith (2002) and Berge (2002). Finally, it has been noted that many students learn best through direct interaction with the instructor and other students, a feature lacking in distance education. (Miller & Webster, 1997; Zirkle, 2002).

### **Purpose of the Study**

The purpose of this study was to determine the perceptions of business education teacher educators across the United States with respect to the barriers of offering courses and programs via distance education. Information regarding the status of these business education teacher preparation programs was also sought, including the types of licensure/certification offered, the numbers of students

enrolled, and the categories of coursework required. Three research questions were addressed:

1. What is the present status of business education teacher preparation in educational institutions in the United States with respect to programs and courses offered and numbers of students enrolled?
2. Which courses and programs in business education teacher preparation are offered through distance education technology?
3. What are the perceptions of business education teacher educators in the United States regarding specific barriers associated with offering business education teacher preparation courses and programs at a distance?

## **Methods**

### **Subject Selection**

The first step in the selection process consisted of a search of state department of education websites for state approved business education teacher preparation programs and the contact information of the individual in charge of each program. Once the number of programs in a given state was determined, if the contact information was not available at the state department of education website, a search of the college/university website was conducted. Contact information that was available at the state department of education website was verified through a search of the university's website. A database was created with a total of 310 colleges and universities determined to have business education teacher preparation programs. In order to obtain the maximum number of responses, it was decided to send the survey questionnaire to each of the 310 colleges and universities. In programs with more than one identified faculty member, the survey questionnaire was sent to the faculty member designated as having a leadership role for the program, such as a department chair. In order to assure representative responses with respect to distance education programming, a request was made to the designated recipient to direct the survey questionnaire to an individual knowledgeable in distance education, if such a person existed in the program.

### **Instrumentation**

The first section of the survey questionnaire consisted of institutional information, business education teacher licensure information, and information regarding the institution's use of distance education. Institutional information was comprised of questions regarding the type of institution (public or private), the calendar system used (quarter or semester), and the approximate enrollment at the institution. The business education teacher licensure program information consisted of questions regarding subject areas offered, the type of business education certificate or license offered, the number of students enrolled in the program, and the

breakdown of hours between business content, teaching pedagogy, and general education requirements. The distance education information asked participants to answer “yes” or “no” to whether they offer partial or whole programs through distance education. If participants answered “yes”, they were asked to list the program/course titles offered at a distance.

The second section, which was constructed based on the work of other studies by Garland (1993), Galusha (1998), Hillesheim (1998), Waits and Lewis (2003), Yap (1996), and Zirkle (2002), addressed distance education barriers. Thirty-six barriers were developed and placed into one of the three following categories: institutional barriers, faculty/instruction barriers, and student/learner barriers. Each category consisted of 12 statements. A four point Likert scale was constructed consisting of the following:

- 1 - no impact for this barrier
- 2 - minor impact - on isolated occasions, is/was a barrier
- 3 - moderate impact - is/was a barrier on several occasions
- 4 - major impact - is/was a consistent barrier

Respondents were asked to rank their perceptions of the selected barriers to offering business teacher preparation courses or programs at a distance using the scale above.

The final section of the survey questionnaire utilized an open-ended question which asked respondents to elaborate on any of the previous barriers to distance education. Respondents were also asked to provide additional barriers if appropriate.

The survey questionnaire was examined for face validity by a panel of experts. Three tenured faculty members experienced in distance delivery were part of the panel, as well as an associate dean for teacher education. Comments and suggestions for change were solicited and incorporated into the questionnaire where appropriate.

## **Procedures**

The procedure for distributing the survey questionnaire began with an email informing teacher educators that they had been selected as potential participants in the study and informed the recipients that they would be receiving a questionnaire through regular mail. Participants were also given the choice to receive the questionnaire via email. Survey questionnaires sent through regular mail included a self addressed stamped envelope and a letter describing the research.

## **Data Analysis**

Data were analyzed in three ways:

1. Demographic data were summarized according to the following components: institutional characteristics, numbers of licensure programs,

- and the number and type of distance education courses and programs offered
2. The statistical package SPSS 14.0 was used to input the responses to the Likert style questions, which were analyzed through basic descriptive measures
  3. By using qualitative measures, responses to the open-ended questions were summarized and examined for themes, specific data, and other information

### **Limitations**

Distance education has been evolving as an instructional medium for decades, dating back to paper-based correspondence courses by mail. As technology changes, educational institutions will adapt their instructional methods. Some institutions have embraced distance education, while some have not, and still others are undecided. Establishing a stable point in time for determining the status of courses and programs in business education teacher preparation that utilize innovative technology for distance delivery is difficult and was recognized as a potential limitation of this study.

### **Results**

After the initial contact, the researchers received emails or written responses from 17 institutions indicating they no longer had a program in business education teacher preparation. From the original list of 310 institutions, this reduced the potential number of survey respondents to 293. A total of 165 survey questionnaires were returned, for a response rate of 56.3%. Each of the 165 survey questionnaires had complete responses to the 36 barriers of interest from the Likert style questions and were deemed usable. Responses to the open-ended questions varied in length. Of these 165 survey questionnaires, 95 were from educational institutions that identified themselves as state-assisted, while 70 were private colleges or universities. The vast majority (153) were on a semester-based academic calendar. Total enrollments in the institutions ranged from approximately 500 students at a small private college to over 50,000 at a state-assisted university.

Survey questionnaires with multiple choices, such as the Likert-type scale utilized in this study, can be analyzed via Cronbach's Alpha to determine inter-item reliability (Gloeckner, Gliner, Tocterman & Morgan, as cited in Farmer & Rojewski, 2001). Using the data from this study, Cronbach's Alpha was calculated at .848.

### **Research Question 1**

What is the present status of business education teacher preparation in educational institutions in the United States with respect to programs and courses offered and numbers of students enrolled?



There was a diversity of response with respect to the types of business education teacher preparation programs and certifications/licenses offered by colleges and universities. The most common teacher certification/licensure program reported was in business education teacher preparation, generally for grades seven through twelve. Some institutions reported the certification/licensure to include information technology, technology, or some type of computer fundamentals/basics as part of the credential. Other institutions reported offering endorsement or “add-on” programs in business education/information technology, which allow teachers with existing certifications/licenses in other teaching fields to acquire another teaching credential. The baccalaureate was predominantly listed as the degree associated with the licensure program, although some institutions have post-baccalaureate and master’s programs available to obtain the certification/licensure.

Enrollment in business education teacher preparation programs also varied widely. From a low of five students to a high of over 75, many business education teacher preparation programs seemed to be in states of transition. One respondent noted “Our business education teacher preparation continues to be one of our more popular programs. We have been successful in maintaining the program number at between 65-75 students currently in the program.” Another stated, “This is a post-baccalaureate program only and we have no current students in the program.”

## **Research Question 2**

Which courses and programs in business education teacher preparation are offered through distance education technology?

There were five institutions that indicated their particular business education teacher preparation program was available completely via distance methodologies. Forty-six of the 165 respondents reported their program as being offered partially through distance education. The remaining respondents (114) reported no distance education programming within their business education teacher preparation curriculum.

Respondents were asked to categorize courses offered via distance education into general education (general college and university requirements for graduation, consisting of courses in English, mathematics, arts/humanities, and the sciences), business content, and teaching pedagogy. Of those listing courses in their program as being taught via distance, respondents indicated a lack of knowledge regarding distance general education courses, since those courses were not in their departments. With respect to business content courses, 14 reported courses in Introduction to Management and Introduction to Marketing as being taught via distance education. In addition, several courses focusing on technology were commonly taught via distance education, such as Desktop Publishing, Web Design, and Keyboarding. Courses related to teaching pedagogy were less likely than business content courses to be taught via distance. However, of pedagogy courses, respondents did list courses

in Introduction to Curriculum (11 responses) and Teaching Diverse Learners (eight responses) as those taught more commonly via distance.

### Research Question 3

What are the perceptions of business education teacher educators in the United States regarding specific barriers associated with offering business education teacher preparation courses and programs at a distance?

**Institutional Barriers.** Several of the institutions indicated the primary issue to offering any courses via distance education was that the notion of offering courses in this manner would run counter to the institutional mission and philosophy. One respondent noted, “My college is a very traditional four-year liberal arts college that still believes in the desirability of face to face contact between teachers and students and students and students. There has never been a serious discussion of distance learning to my knowledge.” Another mentioned, “My university has no interest in developing distance education courses.”

Support, planning, and funding were ranked as the top institutional barriers to distance education by the respondents. One respondent commented, “The major obstacle for us is the lack of resources. We currently do not have the personnel in place or budget for offering a lot of online courses.” Another noted, “Funding for technology is a major barrier.” Table 3 lists the barriers ranked from highest to lowest.

Table 3  
*Institutional Barriers to Distance Education as Perceived by Teacher Educators*

<u>Institutional Barriers</u>	<u>M</u>	<u>SD</u>
Support staff to help with course development	2.95	1.02
Strategic planning for distance education	2.92	.97
Funding to implement distance education programs	2.91	1.08
Shared vision for distance education in the institution	2.87	1.01
Start-up costs for distance education programming	2.86	1.06
Climate for organizational change	2.82	1.12
Technical support	2.63	.94
Technology-enhanced classrooms, labs, or infrastructure	2.38	.96
Security issues (computer crime, hackers, piracy, viruses)	2.04	1.04
Library access to get resources for class	1.74	.75
Local versus out-of-state tuition	1.72	.90

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Registration, students' ability to register for classes	1.71	.83
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**Faculty/Instruction Barriers.** Respondents had strong opinions about the use of distance education overall. The time needed to develop courses for distance delivery was listed as the highest-ranked barrier, a finding consistent with many other surveys on the use of distance education. The lack of compensation and incentives for faculty to offer courses at a distance were also ranked highly.

With respect to preparing business education teachers through distance methodologies, one respondent stated, "The philosophy of business teacher educators is that preparing teachers must be a face-to-face interactional endeavor." Another noted, "As a program area we feel that methods should not be taught online. The use of modeling is an important component of a methods course and is surely diminished in this forum." Table 4 lists all the barriers surveyed.

Table 4  
*Faculty/Instructional Barriers as Perceived by Teacher Educators*

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<u>Faculty/Instructional Barriers</u>	<u>M</u>	<u>SD</u>
Time commitment	3.30	.86
Faculty compensation, incentives, etc. to implement DE	3.01	1.03
Resistance to online teaching methods	2.87	.99
Faculty training to implement distance education	2.81	1.06
Faculty level of technical expertise	2.77	.98
Ability to teach career and technical content at a distance	2.56	.96
Keeping up with technological changes	2.47	.89
Colleague knowledge/support of distance education	2.39	.87
Concerns with evaluation, testing, assessment, outcomes	2.36	.83
Ability to monitor identity of distance education students	2.24	.81
Intellectual property issues	2.03	.79
Job security issues	1.49	.78

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**Student/Learner Barriers.** Respondents from several institutions indicated the ability to learn content at a distance as a perceived concern for learners. Additionally, teacher educators perceived the isolation from other students and faculty and the absence of an instructor as student barriers to distance education. Because of the absence of an instructor in a distance education setting, motivation and quality of work issues arise. One respondent stated, "Students tend to max out their time to complete the course. Too many seem to be cramming all the work at the end." Table 5 lists the barriers ranked from highest to lowest.

Table 5  
*Student/Learner Barriers to Distance Education as Perceived by Teacher Educators*

<u>Student/Learner Barriers</u>	<u>M</u>	<u>SD</u>
Ability to learn career/technical content at a distance	2.80	.98
Isolation from other students and faculty	2.48	.82
Absence of an instructor (motivation, quality of work issues)	2.38	.78
Time constraints associated with job responsibilities	2.30	.94
Student support services (help with advising, admissions, financial aid, etc.)	2.18	.85
Student's availability of technology (Internet services, computer access, etc.)	2.18	.82
Student's level of technical expertise	2.13	.84
Technology fees (increased costs associated with distance education)	2.01	.89
Monetary issues- paying for courses	2.01	.89
Instructor availability (students' ability to contact instructor and discuss concerns)	1.98	.80
Obtaining grades, transcripts, and other course related records	1.60	.67
Transferability of credits	1.46	.72

## Conclusions

### Institutional Barriers

It appears that there is a small minority of institutions that, while intrigued by the utilization of distance education, are not interested at this time in using it to deliver their business education teacher preparation programs. Institutions not currently utilizing distance education programs appear hesitant that if implemented, the underlying philosophy and mission of the school would be lost. One respondent stated, "Our program has no interest in more plans to offer any portion of our teacher prep program via distance learning. To do so would run counter to the philosophy of our institution, i.e., that at the heart of all education is relationships. Distance education, we believe, by its very nature inhibits relationships."

Among those institutions who utilize distance education, supporting, planning, and funding distance education efforts appear to be the biggest challenges. It seems that if a support staff were put in place to help educators with distance education and course development, implementation would be less challenging. This lack of support was noted by one respondent, who stated, “We don’t offer distance learning courses. There are distance learning components (e.g. Blackboard, etc) but there is no barrier in place nor is there much encouragement in the school at this time.” Yet another respondent stated, “The Business Education teacher preparation program is housed in the School of Business. Our current dean will not allow us to develop distance learning at this time.”

Additionally, funding issues, such as the lack of resources available and compensation for the instructors also seem to be major obstacles in utilizing a distance education program. In support of this conclusion, one respondent stated, “The major obstacle for us is the lack of resources. We currently do not have the personnel in place or budget for offering a lot of online courses.”

### **Faculty/Instructional Barriers**

As with many prior distance education studies, the time commitment associated with the transition of traditional, on-campus courses to a distance format was identified as the largest barrier. In addition to the instructor’s original responsibilities, this may make the implementation of an online course seem unattractive. Also, as found by previous studies (Franklin & Kaufman, 1999; Lynch & Corry, 1998; Picciano, 2001; Wolcott, 1999), faculty compensation and incentives for developing these courses stood out as a barrier. It is clear faculty wish to be compensated for their time when it relates to distance education course delivery. One respondent noted, “The institutional reward system doesn’t recognize any contributions except research.”

Finally, it appears that educators are wary of teaching certain content via distance, and may believe that some subject matter cannot be taught outside of a traditional classroom. In support of this conclusion, one respondent stated, “There is a notion held by some faculty that anything can be taught via distance learning/online format. As we are about preparing people to teach people, it seems to run counter to common sense that a total online delivery mechanism/method would be the best choice.”

### **Student/Learner Barriers**

As perceived by educators, the ability to learn career/technical skill content outside of a traditional classroom appears to be the biggest challenge for learners at a distance. While some of the computer-based skills found in business education teacher preparation courses can be effectively taught online, many of the skills found in labs can only be obtained through actual interaction with the equipment (Zirkle,

2004). This perception could also be a function of the isolation from other students and faculty, and/or the absence of an instructor. It also appears some educators are concerned that students cannot learn teaching pedagogy in an online setting. One respondent claimed, “We hesitate offering distance education especially in teaching pedagogy. Interaction with faculty and learning from veteran teaching professors is a major priority.”

Another challenge for students as perceived by educators seems to be staying motivated in this type of setting. This also may have to do with the lack of face-to-face interaction, and could impact the quality of the students’ work. Finally, it appears time constraints associated with students’ job responsibilities are also a barrier to distance education. Time management is extremely important in this type of setting, and some learners may not be able to put the adequate amount of time in to successfully complete the course.

## **Recommendations**

### **Institutional Barriers**

Overall, respondents listed lack of support as the highest institutional barrier to distance education. Therefore, it is recommended that institutions looking to utilize distance education put a support system in place to implement such programs. Several positive responses appear to support this recommendation. One respondent stated, “Our university is very supportive of distance education. We have a great financial and technical support. Our department in particular has been a leader and a model for distance education at our university. We have training available for anyone interested in starting distance education courses.” Another respondent noted, “Distance education is a part of our extension role of our university. We have had good support as a part of that mission.” Schools that have success with distance education appear to have excellent support systems in place to assist instructors and personnel with implementation.

Additionally, funding was ranked highly by respondents as another institutional barrier to distance education. Institutions receiving funding for distance programs appear to have fewer challenges with implementation. One respondent noted “Even though I have highly ranked ‘funds to implement’ and others, this does not mean that it was a barrier rather a factor in us being able to start a distance learning program. We received a start up grant from the Outreach Office of the University.” Yet another respondent stated, “We have a grant with the Higher Education Department to develop online licensure programs. The grant includes having a faculty developer to train faculty to develop courses.” Therefore, it is recommended that schools looking to utilize distance education programs search for external funding sources to assist with program implementation.

### **Faculty/Instructional Barriers**

Time constraints to utilize distance education programs and faculty compensation and incentives were the highest ranked faculty/instructional barriers. These two barriers go hand-in-hand with one another. The time it takes to implement a distance education program can be very extensive, and many educators may shy away from this commitment. Therefore, it is recommended that some incentive program be put in place to assist faculty during this transitional period. Distance education provides many benefits for learners, educators, and the institution, therefore, providing incentives and compensating the instructors is highly recommended to help break down this barrier for schools looking to implement such programs.

Another faculty/instructional barrier highly ranked by respondents was the resistance to online teaching methods. Therefore, it is recommended that institutions looking to utilize distance education take steps to educate instructors and personnel of the many benefits of distance learning to overcome this resistance.

### **Student/Learner Barriers**

The ability for students to learn career/technical content at a distance was perceived by educators to be the highest student/learner barrier to distance education. Several other barriers ranked by respondents play a key role in complicating this perceived challenge. Educators voiced concern about the isolation from other students and the absence of an instructor in distance learning programs. Many measures can be put in place to reduce the perceived isolation brought on by distance education. Telecommunication technology, described earlier in Table 2, can be used to decrease student isolation. By using telecommunication technology, students can benefit from synchronous instruction via distance, closely mimicking a traditional classroom. Therefore, it is highly recommended that institutions looking to utilize a distance education program invest in resources and technology to help reduce student isolation. Resources and technology put in place to reduce isolation may also increase student motivation, another concern voiced by educators. Higher-quality technology, such as videoconferencing and computer-based simulations, can assist with instructional strategies designed to develop students' technical skill expertise.

### **Final Thoughts**

Addressing all these various barriers is key to any distance education effort. As this study has demonstrated, institutions, faculty, and students engaged in distance education may experience unique constraints. Additional studies such as this one are needed to identify, categorize, address, and hopefully correct these barriers to access.

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