

Effects of virtual education on academic culture: Perceived advantages and disadvantages*

Renée N. Jefferson¹, Liz W. Arnold²

(1. School of Education, The Citadel: The Military College of South Carolina, Charleston 29409, US;

2. Department of Accounting, The Citadel: The Military College of South Carolina, Charleston 29409, US)

Abstract: The perceived advantages and disadvantages of courses taught in online and face-to-face learning environments were explored for students taking an accounting and a data collection and analysis course. Both courses were taught in a face-to-face learning environment at the main or satellite campus. It was hypothesized that there would be statistically significant differences in the perceived advantages and disadvantages of courses taught in online and face-to-face learning environments. Results showed statistically significant differences between perceived advantages and disadvantages for both learning environments. Findings suggest that there are differences between the perception of advantages and disadvantages for online and face-to-face learning environments.

Key words: virtual education; academic culture; colleges and universities; instructional environment

1. Introduction

The use of virtual technologies to supplement or deliver courses in higher education has challenged faculty to examine their culture of instruction (Travis & Price, 2005). Faculty must examine the impact these technologies have on different aspects of instruction (e.g., course content, course delivery, and assessment). A preliminary review of the literature revealed the importance of comparing online and traditional (face-to-face) learning environments (Fortune, et al., 2006; Mooteram, 2006; Anagnostopoulos, et al., 2005; Joint, 2005; Sauers & Walker, 2004). In this study, the effects of virtual technologies on the academic culture of students will be explored.

According to Churchill (1979), the protocol for scale development, refinement, and testing includes the following: (1) review of literature; (2) discussion of concepts and ideas with academic experts and practitioners; (3) specification of construct domain; (4) development of sample items and scales; (5) collection of data; and (6) evaluation of measurement properties and scales. The current study represents the first phase and focuses on the academic culture of virtual education by exploring differences in student perceptions about online and face-to-face learning environments at The Citadel, located in the southeast United States.

The study is important because it focuses on the perceptions of students who have not experienced learning in a completely online environment. In this environment, virtual technologies are used to supplement face-to-face

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Renée N. Jefferson, Ph.D., associate professor, School of Education, The Citadel: The Military College of South Carolina; research fields: education measurement and statistics.

Liz W. Arnold, Ph.D., associate professor, Department of Accounting, The Citadel: The Military College of South Carolina; research field: accounting.

instruction. Students use web-based course management systems to access course documents and electronic mail to communicate with the instructor and classmates outside the learning environment.

The academic environment of the institution is unique. The Citadel is a state-supported comprehensive military college. Undergraduate students (males and females) are admitted to the residential Corps of Cadets. In addition to the day program, undergraduates and graduate programs are offered through the College of Graduate and Professional Studies in the evening. Degrees are offered in the humanities, business, mathematics, science, engineering and education.

The purpose of this study was to identify differences in perceived advantages and disadvantages of online and face-to-face learning environments. Students were enrolled in an accounting or a data collection and analysis course. The accounting course is taught in the School of Business and the data collection and analysis course is taught in the School of Education. The courses were selected because they focused on complex analysis of data. Courses were taught on-campus or at a satellite campus located approximately 11 miles from the main campus.

2. Research hypotheses

(1) H₁: The proportion of perceived advantages will be different than the proportion of perceived disadvantages for courses taught in an online learning environment.

(2) H₂: The proportion of perceived advantages will be different than the proportion of perceived disadvantages for courses taught in a face-to-face learning environment.

(3) H₃: The proportion of perceived advantages for courses taught in an online learning environment will be different than the proportion of perceived advantages for courses taught in a face-to-face learning environment.

(4) H₄: The proportion of perceived disadvantages for courses taught in an online learning environment will be different than the proportion of perceived disadvantages for courses taught in a face-to-face learning environment.

3. Method

3.1 Sample

Participants included 49 students enrolled in accounting and data collection and analysis courses (51% accounting, 49% data collection and analysis). Students were enrolled in either an introductory undergraduate or graduate accounting course or a graduate data collection and analysis course. The School of Education does not offer an undergraduate course in data collection and analysis or related subject.

3.2 Instrument

A web-survey was used to collect data. The survey, "Learning Environment Questionnaire," queried students about perceived advantages and disadvantages of courses taught online and face-to-face. The response format consisted on five open-ended questions.

3.3 Procedure

Two web-based course management systems were used to collect data. Students enrolled in the accounting course accessed the survey using homework manager. Students enrolled in the data collection and analysis course accessed the survey from Web CT. Each group was given one week to return the survey.

Incentives were provided for students to complete the survey. For the accounting course, students completing the survey did not have to take two of the 10 required quizzes. The two quizzes represented one percent of the

final course grade. For the data collection and analysis course, the lowest of three test scores was not included in the final course grade. The lowest test score represented 20% of the final course grade. A larger incentive was used in this course because the design, implementation, analysis, and presentation of a research study are the primary objectives of the course.

Students were required to read a consent form prior to completing the survey. The consent form, included in with the survey, contained information about the purpose of the study, confidentiality, and anonymity. Students were informed that participation was completely voluntary, and they elect not to participate without prejudice or penalty. Completed surveys were posted either to the course management system or emailed to one of the researchers. Since participation was voluntary, submission of the form constituted consent. A copy of the results was available to students upon request.

3.4 Data analysis

Data collected for the study were analyzed using a software program developed by the Center for Disease Control and Prevention (CDC) designed “to assist researchers in creating, managing, and analyzing semi-structure qualitative databases” (CDC, 2007, para. 1). The software, CDC EZ-TEXT, was used to enter and code responses.

Descriptive statistical procedures were used to calculate frequencies and percentages, along with cross-tabulation tables. Chi-square analysis was used to test for significant differences in perceived advantages and disadvantages.

4. Results and discussion

The response rate was 69% (15 out of 25 from accounting; 19 out of 24 from data collection and analysis). The responses for the four open-ended questions produced 120 identifiable terms related to advantages and disadvantages for the two learning environments. Similar responses were grouped resulting in 31 terms. The 31 terms were group into seven categories that could be divided dichotomously into advantages and disadvantages: (1) course content, (2) feedback, (3) communication, (4) flexibility, (5) motivation, (6) relationships, and (7) travel.

Table 1 Examples of category descriptors for combined learning environments

Category descriptor	Advantages	Disadvantages
Communication	<ul style="list-style-type: none"> ● Spend more time on difficult concepts ■ Nonverbal communication 	<ul style="list-style-type: none"> ● Easy to be misunderstood ■ Not confident asking questions
Course content	<ul style="list-style-type: none"> ● Reinforcement of information ■ Supplement to face-to-face course 	<ul style="list-style-type: none"> ● Teach self new information ■ Content more demanding
Feedback	<ul style="list-style-type: none"> ● Ask questions 24/7 ■ Immediate response to questions 	<ul style="list-style-type: none"> ● Delayed response to questions ■ Limited time to ask questions
Flexibility	<ul style="list-style-type: none"> ● Work at own pace ■ Specified time to learn 	<ul style="list-style-type: none"> ● Time consuming ■ Time is not flexible
Motivation	<ul style="list-style-type: none"> ● Require more discipline ■ Require less discipline 	<ul style="list-style-type: none"> ● Emphasis on self-learning ■ Location of class
Relationships	<ul style="list-style-type: none"> ● Global networking ■ Professor/student support 	<ul style="list-style-type: none"> ● Difficult forming relationships ■ Teacher/student personality conflict
Travel	<ul style="list-style-type: none"> ● Don't have to leave home ■ Forced to leave home 	<ul style="list-style-type: none"> ● Retrieving materials not online ■ Inconvenient to get to class

Notes: (1) ●: Online learning environment; (2) ■: Face-to-face learning environment.

Examples of the category descriptors are presented in Table 1. Table 2 shows the percentages of category descriptors identified for each learning environment. The total number of perceived advantages (56%) was greater than the total number of perceived disadvantages (44%). Perceived advantages and disadvantages were not

analyzed between the two courses due to the limited number of responses. Table 3 presents the percentages of category descriptors identified for the face-to-face learning environment. Statistically significant results were found between perceived advantages and disadvantages ($\chi^2_{(df=6)}=77.5, p<0.01$). Post hoc analyses resulted in significant results for six of the seven categories ($\chi^2_{(df=1)}=10.7$ to $\chi^2_{(df=1)}=26, p<0.01$) for course content, travel, feedback, communication, flexibility, and relationships, respectively).

Table 2 Percentage of category descriptors by course

Category descriptor	Advantages		Disadvantages	
	Accounting	Data collection	Accounting	Data collection
Communication	14%	5%	11%	-----
Course content	5%	16%	15%	5%
Feedback	14%	8%	8%	2%
Flexibility	27%	29%	14%	42%
Motivation	8%	29%	18%	19%
Relationships	27%	25%	29%	11%
Travel	5%	7%	5%	21%
	$n_1=66$	$n_2=91$	$n_3=65$	$n_4=57$

Table 3 Percentages of category descriptors identified for face-to-face learning environments

Category descriptor	Advantages	Disadvantages
Communication**	9%	-----
Course content**	20%	5%
Feedback**	16%	2%
Flexibility**	4%	42%
Motivation	7%	19%
Relationships**	44%	11%
Travel**	-----	21%
	$n_1=92$	$n_2=97$

Note: ** $p<0.01$.

The percentages of category descriptors identified for the online learning environment are presented in Table 4. Statistically significant results were found between perceived advantages and disadvantages ($\chi^2_{(df=6)}=100, p<0.01$). Post hoc analyses resulted in significant results for six of the seven categories ($\chi^2_{(df=1)}=4.8, p<0.05$ for course content) and ($\chi^2_{(df=1)}=9$ to $\chi^2_{(df=1)}=34.4, p<0.01$ for travel, communication, feedback, relationships, and flexibility, respectively).

Table 4 Percentages of category descriptors identified for online learning environments

Category descriptor	Advantages	Disadvantages
Communication**	-----	15%
Course content*	11%	20%
Feedback**	2%	26%
Flexibility**	61%	2%
Motivation	12%	22%
Relationships**	-----	15%
Travel**	14%	-----
	$n_1=65$	$n_2=54$

Notes: * $p<0.05$; ** $p<0.01$.

The percentages of category descriptors coded as advantages for each learning environment are presented in Table 5. Statistically significant results were found between advantages of online and face-to-face learning environments ($\chi^2_{(df=6)}=93.1, p<0.01$). Post hoc analyses resulted in significant results for six of the seven categories ($\chi^2_{(df=1)}=4.8, p<0.05$ for course content) and ($\chi^2_{(df=1)}=8$ to $\chi^2_{(df=1)}=41, p<0.01$) for communication, travel, feedback, flexibility, and relationships, respectively). Table 6 presents the percentages of category descriptors coded as disadvantages for each learning environment. Statistically significant results were found between disadvantages of online and face-to-face learning environments ($\chi^2_{(df=6)}=75.3, p<0.01$). Post hoc analyses resulted in significant results for six of the seven categories ($\chi^2_{(df=1)}=8.4$ to $\chi^2_{(df=1)}=18.6, p<0.01$) for relationship, course content, travel, communication, feedback, and flexibility, respectively).

Table 5 Percentages of category descriptors coded as advantages

Category descriptor	Online	Face-to-face
Communication**	----	----
Course content*	11%	5%
Feedback**	2%	2%
Flexibility**	61%	42%
Motivation	12%	19%
Relationships**	----	21%
Travel**	14%	----
	n ₁ =65	n ₂ =92

Notes: * $p<0.05$; ** $p<0.01$.

Table 6 Percentages of category descriptors coded as disadvantages

Category descriptor	Online	Face-to-face
Communication**	15%	----
Course content**	20%	5%
Feedback**	26%	2%
Flexibility**	2%	42%
Motivation	22%	19%
Relationships**	15%	11%
Travel**	----	21%
	n ₁ =54	n ₂ =57

Note: ** $p<0.01$.

5. Limitation of the study and future studies

The primary limitations of the study were the size of the sample, inter-coder reliability, and the perceived difficulty level of the courses. While the sample size may have been adequate for the current study, it is likely that a larger sample would produce additional response categories. For example, the response categories did not address issues related to types of assignments or examinations (i.e., objective versus subjective assessments).

In order to assess inter-coder reliability, more than one coder should categorize the responses. Additionally, the perceived level of difficulty for courses should be assessed, and the types of courses should be expanded to include other business and research related courses.

This study is the first phase of a multi-phase research plan. Future phases include: (1) replicating phase one

with a larger sample; (2) assessing inter-coder reliability; (3) conducting an extensive literature review; and (4) creating an instrument to assess perceived advantages and disadvantages of the learning environments.

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