

A FACTOR ANALYSIS OF THE DISTANCE EDUCATION SURVEYS “IS ONLINE LEARNING RIGHT FOR ME?” AND “WHAT TECHNICAL SKILLS DO I NEED?”

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INTRODUCTION

There is a general consensus that the number of students receiving an education through distance education has continued to grow steadily (Instructional Technology Council, 2007; National Center for Education Statistics, 2004; Saba, 2005). However, some students have found the distance education environment less attractive than the on-campus environment (Lorenzetti, 2005a). This may have contributed to the lower retention rates reported for distance education students (Carr, 2000; Nash, 2005; O'Brien & Reneer, 2002; Scalese, 2001). The lower retention rates for distance education students has led several researchers to discuss the need for preassessments to identify students who might have difficulties in a distance learning environment (Biner, Bink, Huffman, & Dean, 1995; Buchanan, 1999; Lorenzetti, 2005b; Maki & Maki, 2003; Restauro, 2004; Valasek, 2001). However, com-

monly used readiness questionnaires given to students prior to the start of a course may not be useful in selecting students who will do well in and be satisfied with technology-mediated courses (Maki & Maki).

A study was conducted by Hall (2008) to determine the predictive validity of two survey instruments, “Is Online Learning Right for Me?” and “What Technical Skills Do I Need?” The survey “Is Online Learning Right for Me?” was developed by the Northern Virginia Community College Extended Learning Institute. The survey “What Technical Skills Do I Need?” was developed by Palm Beach Community College. Both surveys are 15-question, forced response, self-scoring guides that have face validity for individual traits and skills believed to contribute to potential success in an Internet-based course (Buchanan, 1999; Noah, 2001). Each response is assigned a numerical value. A total score is calculated by summing the individual question scores. The survey is

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designed such that the higher the total score, the greater the presumption for success in a distance education course. Copies of the survey items responses are provided in Tables 1 and 2. An abbreviated list of colleges and universities using one or both of these surveys include Ivy Tech Community College, Colorado Community College, Palm Beach Community College, University of Minnesota, Wisconsin Technical College, and the University of Maine.

In the predictive validity study by Hall (2008) copies of the surveys were distributed to 340 students enrolled in traditional on-campus courses enrolled on three different regional campuses of a Midwestern community college.

Copies of the surveys were placed on web servers for 289 students enrolled in web-based distance education classes at the same community college campuses. Multiple regression models were constructed using the two scores from the survey instruments and categorical variables representing the type of course as the independent variables. The final semester grade percentage was used as the dependent variable. A total of 228 traditional on-campus students and 83 distance learning students completed the two surveys and received a final grade percentage in their courses.

The multiple regression model developed from the on-campus student data predicted 7%

TABLE 1
"Is Online Learning Right for Me?" Questionnaire Items and Factor Loadings

<i>Factor</i>		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Eigenvalue		2.89	1.78	1.45	1.28
% of variance		18.1	11.0	9.1	7.9
<i>Survey Question and Responses</i>		<i>Loading</i>	<i>Loading</i>	<i>Loading</i>	<i>Loading</i>
Q11	My experience/level of comfort with computers in general: A. Strong (I use computers every day). B. Average (I use computers when I need to) C. Weak (I have never used a computer before or very little).	.87	.06	.11	.12
Q10	My experience/level of comfort with the Internet is: A. Strong (I use the Internet a lot). B. Average (I use the Internet occasionally) C. Weak (I have never used the Internet before or have used it very little).	.85	.12	.00	.06
Q8	When I am asked to use computers, or the Internet, new software, e-mail, or other technologies new to me: A. I look forward to exploring and learning new skills. B. I feel apprehensive, but try it anyway. C. I put it off or try to avoid it.	.60	.11	.44	.05
Q12	If I take an online class I would access the Internet through a computer: A. In my home. B. At school or at work. C. At another location.	.46	.04	-.13	.00
Q4	Classroom discussion is: A. Rarely helpful to me. B. Sometimes helpful to me. C. Almost always helpful to me.	.00	.77	-.05	.06

(Table continues on next page)

TABLE 1
Continued

	<i>Survey Question and Responses</i>	<i>Loading</i>	<i>Loading</i>	<i>Loading</i>	<i>Loading</i>
Q2	Feeling that I am a part of a class is: A. Not particularly important to me. B. Somewhat important to me. C. Very important to me.	-.05	.66	-.14	.30
Q15	I express myself best with: A. Word-processed communication, including e-mail. B. Handwritten communication and U.S. mail. C. Oral, verbal communication	.12	.58	.16	-.12
Q5	When an instructor hands out directions for an assignment I prefer: A. Figuring out the instructions for myself. B. Trying to follow the directions on my own, then asking for help as needed. C. Having the instructions explained to me.	.13	.47	.18	.34
Q7	Considering my professional and personal schedule, the amount of time I have to work on an online version of this course would be: A. More than 8 hours a week. B. 4 to 8 hours a week. C. Less than 4 hours a week.	.22	.38	.10	-.09
Q14	When faced with situations that fail to go as I planned or expected, I: A. Independently seek solutions to problems as they arise. B. Wait for instructions or assistance before tackling a problem. C. Am easily frustrated and tend to give up when confronting difficulties.	-.04	.07	.68	.23
Q3	I would classify myself as someone who: A. Often gets things done ahead of time. B. Needs reminding to get things done on time. C. Puts things off until the last minute.	-.13	.13	.62	-.03
Q13	When I need help understanding a topic or directions: A. I am comfortable approaching the instructor to ask for clarification. B. I am uncomfortable approaching the instructor, but do it anyway. C. I don't approach an instructor to admit I don't understand.	.27	-.11	.61	-.18
Q1	My need to take this course this semester was: A. High: I needed it immediately for a degree, job or other important reason. B. Moderate: I could have taken it later or substituted another course. C. Low: It's a personal interest that could have been postponed.	-.05	.12	-.24	.54
Q6	I need faculty comments on my assignments: A. Within a few weeks, so I can review what I did. B. Within a few days, or I forget what I did. C. Right away, or I get frustrated.	.06	.08	.19	.52
Q9	As a reader, I would classify myself as: A. Good: I usually understand the material without help. B. Average: I sometimes need help to understand the material. C. Slower than average	.12	.16	.32	.49

Table 2
 “What Technical Skills Do I Need?” Questionnaire Items and Factor Loadings

<i>Factor</i>		<i>1</i>	<i>2</i>
Eigenvalue		4.93	1.54
% of variance		28.7	8.4
<i>Survey Question and Responses</i>		<i>Loading</i>	<i>Loading</i>
Q9	If the computer system I was using had problems:	.66	-.21
	A. I would be able to decide how to handle the problem.		
	B. I think I would call a help line and be able to describe the problem.		
	C. I would have no idea what to do.		
Q8	If a plug-in or other software were required for a computer:	.64	-.16
	A. I would be able to download and install it.		
	B. I have done it before, but some instructions would help.		
	C. I have no idea what you are talking about or how to do such a thing.		
Q6	How often do you create attached files in the email messages you that you send?	.62	-.14
	A. I create, save, and attach files to email frequently.		
	B. I have emailed attachments but not very often.		
	C. I never attached a file to an email message.		
Q10	Do you know how to use bulletin (discussion) boards?	.57	-.15
	A. I use them with little or no difficulty.		
	B. I have used them but a refresher on their use would help.		
	C. I have not used them.		
Q11	Do you know how to use chat rooms?	.57	-.10
	A. I use them with little or no difficulty.		
	B. I have used them but a refresher on their use would help.		
	C. I have not used them.		
Q7	When requested to use or save documents in a different file type such as an “RTF” “Rich Text Format” or an HTML file:	.56	-.16
	A. I would have no difficulty.		
	B. I have done it but a reminder of the process would help.		
	C. I am not sure that I would know how to do that.		
Q3	How often do you send, receive and open email attachments?	.56	-.02
	A. I use email several times each day.		
	B. I use it infrequently (one a week or less).		
	C. I have never used it.		
Q4	How often do you use bookmarks (also called Favorites) to manage the sites you visit frequently on the Internet?	.55	-.07
	A. I use them to manage the sites I visit frequently on the Internet.		
	B. I use them but infrequently.		
	C. I never use them.		
Q14	When asked to print a web page:	.53	-.09
	A. I would have no difficulty.		
	B. I have done it but a reminder of the process would help.		
	C. I am not sure that I would know how to do that.		
Q5	How often do you use search engines to locate information on the Internet?	.49	-.09
	A. I use them frequently and successfully.		
	B. I use them but before but not often.		
	C. I have never conducted an Internet search.		

(Table continues on next page)

Table 2
Continued

	<i>Survey Question and Responses</i>	<i>Loading</i>	<i>Loading</i>
Q15	How would you describe your ability to work with multiple windows, i.e., resizing, minimizing, closing, etc.? A. I can successfully manage several windows on my desktop. B. More than one open application or more than one window confuses me. C. I am not sure what the question means.	.45	.01
Q12	My keyboarding skills and my ability to use word processing software is: A. Very good. B. Okay, but it takes me a while. C. Nonexistent	.43	-.07
Q2	The access speed to the Internet Service Provider (ISP) which I use is: A. very fast and is through a TV cable or some other high speed line. B. through a fast modem (56K or higher). C. through a slow modem (below 56K).	.36	.09
Q13	I would access the Internet through a computer: A. In my home. B. At school or at work. C. At another location.	.43	.80
Q1	I have regular access to: A. A computer and the Internet at home. B. A computer but not the Internet at home. C. A computer and the Internet only at school.	.53	.66

of the observed variance in final grade percentages. All of the observed variance was explained by the type of course (business, computer information services, criminal justice, or early childhood development) taken by the student.

The multiple regression model constructed from data obtained from the distance education students predicted 20% of the observed variance in the final semester grade percentage. However, Hall (2008) observed that scores from the two survey instruments accounted for only 8% of the total variance in the final semester grade percentage. Hall concluded that the two web-based surveys had little predictive validity.

DATA ANALYSIS

The data used for the factor analysis were the survey answers obtained in the Hall, 2008

study of community college on-campus and distance education students. The survey items from both surveys were submitted to a principal component-components factor analysis with varimax rotation and an eigenvalue greater than 1. Individual survey items were associated with factors based on the highest factor loading.

Applied to the survey "Is Online Learning Right for Me?," this analysis yielded four factors with eigenvalues ranging from 1.27 to 2.89. The four factors accounted for 18.1%, 11.0%, 9.1%, and 7.9% of the total variance, respectively. The resultant factors were labeled technology comfort, interaction, self-reliance, and general background. For purposes of this analysis, item Q1 was reverse-coded. For the survey "What Technical Skills Do I Need?," the analysis produced two factors with eigenvalues of 1.54 and 4.93. The two factors accounted for 28.7% and 8.4% of the total variance, respectively. The resultant

TABLE 3
Cronbach Alphas and Associated Survey Items for
“Is Online Learning Right for Me?” and “What Technical Skills Do I Need?”

<i>Instrument</i>	<i>Identified Factor</i>	<i>Associated Survey Items</i>	<i>Cronbach α</i>
Is Online Learning Right for Me?	Technology comfort	Q8, Q10, Q11, & Q12	.71
	Interaction	Q2, Q4, Q5, Q7, & Q15	.54
	Self-reliance	Q3, Q14, & Q13	.40
	General background	Q1, Q6, & Q9	.32
What Technical Skills Do I need?	Skills	Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q14, & Q15	.84
	Access	Q1 & Q13	.84

factors were labeled skills and access. Tables 1 and 2 include the factors and loading values for the two survey items. Table 3 lists the factors, associated survey items, and the Cronbach alphas for each factor.

As shown in Table 3, the survey “Is Online Learning Right for Me?” appears to lack internal consistency. Only one factor, Technology Comfort, had a Cronbach alpha within the generally accepted range of 0.7 to 0.9 (McMillan & Schumacher, 2001). The low Cronbach alphas of the three remaining factors may be caused by several factors, including the low number of items associated with factor (Garson, 2007; McMillan & Schumacher, 2001) and low average correlation among items (Garson). Many items did not load strongly into any of the factors (Table 1).

An examination of Table 3 would appear to indicate that the survey “What Technical Skills Do I Need?” has high internal consistency. Both factors, Skills and Access, have Cronbach alphas of .84. However, the high Cronbach alpha associated with the skills factor may be more related to the relatively large number of items associated with this factor (13) than the individual loadings of these items to this single factor. The Cronbach alpha of .84 for the access factor is derived from just two items (Q13 & Q1) with relatively strong loadings (Table 2). A large number of moderately loaded items, or a few items with strong loadings, can generate relatively high Cronbach alphas, leading to a false conclusion of satis-

factory internal reliability. The skills factor is an example of the former, the access factor an example of the latter.

CONCLUSIONS AND RECOMMENDATIONS

The results from this study support the earlier conclusion by Hall (2008) that the two surveys “Is Online Learning Right for Me?” and “What Technical Skills Do I Need?” have low predictive validity. Although many of the items listed on these surveys have face validity with regard to traits and skills needed for success in distance education, the lack of internal reliability and predictive validity should be a consideration for institutions considering the use of these surveys for counseling or dispensing advice. However, the rising use of the Internet for instructional delivery, coupled with the desire to improve student retention, continues to generate a need for a viable prediction instrument for advising students considering distance education courses.

A potential assessment for further study is the Readiness for Online Learning questionnaire previously studied by Smith, Murphy, and Mahoney (2003) and Smith (2005). Smith suggests that further work to improve the two items that did not factor load distinctively may further enhance the value of this instrument. An attraction of the Readiness for Online Learning questionnaire is its brevity (13

items). Further items could be added to enhance its suitability to assess readiness and potentially predict performance.

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