Individual Student Characteristics: Can Any Be Predictors Of Success In Online Classes?

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Abstract

This study examined various student characteristics to determine their relationship to success in an online undergraduate business course at a community college. All students who had taken this online course during a three-year period of time were included in the study (n=179).

Pearson product–moment correlations found significant relationships between students' grades in the online class and their GPA, attendance at a class orientation session, the number of previous course withdrawals, ASSET reading scores, the number of previous online courses, age, and ACT English scores. Regression analysis found that two variables serve as the best predictors: attendance at an orientation session, and the student's grade point average.

Given the higher dropout rates often found within on-line courses, these findings could be used to counsel students regarding their decision to take an online course. Students who are older, have better GPAs and college entrance exam scores, have few previous course withdrawals, and who agree to participate in a class orientation session, are more likely to be successful in this on-line business class. Such results could hold true for other online courses as well.

Introduction and Related Literature

The past decade has borne witness to a revolution in education with acceleration in the use of online technologies to assist, or in many cases, supplant traditional modes of instruction. Educators recognize the need to offer distance education to meet the demands of the students of the 21 st century, and as a result, many institutions are shifting from purely a campus-centered model of higher education to a more consumer-centered model using newer online technologies (Howell, Williams, & Lindsay, 2003; Twigg & Oblinger). Educational institutions in every state now use a variety of technologies to participate in online learning projects (Dutton, Dutton, & Perry, 2002; Epper & Garn, 2003). As a result more students have the opportunity to advance their education within their home environments.

The benefits of online courses include flexibility, convenience, and cost-effective educational opportunities anywhere and anytime (Carnevale, 2000; Dutton et al., 2002). Online education provides access to information sources and teaching institutions around the world to anyone with

access to a computer, modem, and telephone lines. Such access to information is especially important to students in rural and other isolated environments. Learning is also made more interesting and enriching when new technologies are incorporated into the curriculum (Shrivastava, 1999).

However, courses taught in an online format hold many challenges for the learner and educator alike (Howell et al., 2003). Challenges include the need for computer literacy and navigation skills, greater electronic connection capabilities, and concerns over isolation. Within online classes, students must not only learn the course material but also the technology skills needed to participate in the class. The online learning format places the burden on students to initiate the learning process, and assume primary responsibility for the learning experience. Many students enjoy the convenience of the online experience, but some are ill prepared to initiate the basic tenets of the work (Dutton et al., 2002; Epper & Garn, 2003). The online educational experience can be more stimulating and encourage more critical thinking, but only if the students have a clear understanding of this new learning venue. Unfortunately, institutions often do little to appropriately guide students as they select their course formats.

As a result, various research studies have found a higher percentage of students taking online courses tend to drop those courses when compared to students taking conventional courses (e.g., Frankola, 2001; Oblender, 2002). Oblender (2002) noted that online learning is plagued by high dropout rates, with the average online college course dropout rate in the United States at 50%. Frankola (2001) indicated that institutions are seeing dropout rates that range from 20 to 50% for distance learners, and administrators of online courses agree that dropout rates are often 10 to 20 percentage points higher than in traditional classroom settings.

Such high dropout rates may be a sign that the online environment is not suitable for all students. Students who are unfamiliar with online courses, or students who are simply eager for a change of venue, often need direction as to which course format to select. In a traditional classroom, course content is usually delivered face-to-face in writing or orally. An online course delivers the vast bulk of the content online. Typically there are no face-to-face meetings. Since online learning is different from the conventional classroom, many students that were successful in the traditional classroom format are not equally successful in the online format (Cheung & Kan, 2002; Phipps & Mertisotis, 1999; Tucker, 2001).

Online courses are generally the first format of course offerings to fill up during registration. Since many online courses have a high withdrawal rate, it would be beneficial for students to be placed in a course format most conducive to their learning (Dutton et al., 2002; Snell & Mekies, 1999). The identification of characteristics associated with successful online students could provide the necessary information for teachers and admissions personnel to suggest or discourage a student from registering for an online course. A student mistakenly placed into a course may encounter more difficulties and have reduced chances for success compared to an appropriately placed student (White, Goetz, Hunter, & Barefoot, 1995).

Thus the overall purpose of this research was to examine individual characteristics of successful online students in order to determine if commonalities could be identified. In many previous studies, the enormous variability of the online student population is disguised by gathering samples of students and amalgamating them into averages, which produces an illusory "typical learner" (Dutton et al., 2002; Howell et al., 2003; Threlkeld & Brzoska, 1994). This issue is particularly of concern for online courses, which are taken by a more heterogeneous population of learners, in terms of characteristics such as preferences, skills, and needs, than traditional college students who take classes on campuses (Phipps & Merisotis, 1999). Students in an online

course may appear "typical," but there is a great degree of diversity within the online student population (Cheung & Kan, 2002). Such variability within online student populations supports the need to identify individual student characteristics that could be used for proper course placement advising. To this end, this study was conducted.

The Focus of the Study

Various student characteristics were examined to determine their relationship to student grades (i.e., success) in an online undergraduate business course, including: (1) gender; (2) age; (3) previous courses completed online; (4) American College Testing (ACT) English Scores; (5) ACT Reading Scores; (6) ACT Composite Scores; (7) Assessment of Skills for Successful Entry and Transfer (ASSET) Reading Scores; (8) ASSET Writing Scores; (9) grade point average; (10) previous withdrawal from other courses; (11) semester format (16-week versus 8-week); (12) student status (full-time vs. part-time); and (13) attendance at an orientation session. These variables were selected given the availability of data, and in some cases because previous research findings had noted some possible connection to student success in online courses. Such previous research studies will be summarized in the conclusions section in relation to findings from this study.

Each of these variables should be familiar to the reader so no definitions are offered, except for the ASSET tests which are used by many community colleges for academic planning and advising. These ASSET results are used to place students into appropriate reading and math courses when they initially enroll at this community college.

Data were collected from students taking an online business course offered through a small, rural community college in western Michigan . The population included all 179 students registered for this course beginning with fall semester 2000 through summer semester 2003, for a total of nine different semesters. The same instructor using the same textbook offered all courses, providing instructional consistency across three years of courses.

This online course is delivered totally over the Internet, whereby students log on from home (or elsewhere) to send and receive assignments, participate in virtual class discussions, and interact with other students as well as the instructor. The course is organized into 15 weekly modules that include weekly assignments, and then an overall final exam. Weekly assignments include reading chapter lecture notes and a corresponding chapter in the text, completing chapter quizzes, and completing discussion assignments. The Blackboard platform is used, which allows students to manage their own Internet-based file space on a central system and to collect, share, discover, and manage important materials.

An orientation session is offered prior to the start of the semester, with one during the day and one in the evening. Sessions are not mandatory but highly recommended. The 1-hour orientation session includes information on assignments, usage of Blackboard, social presence, and also provides an opportunity to develop community within the course.

Information on student characteristics were extracted from a main campus database, which contains personal data on individual students collected as they initially apply for admission (e.g., gender, date of birth, and achievement test scores), as well as information gathered and updated each semester the student is in attendance at the community college (e.g. courses enrolled in, grade point average, withdrawal from courses, semesters students are enrolled, and the number of credit hours registered for per semester). All but one of the independent variables used for this

study were extrapolated from this database. The final independent variable -- attendance at an orientation session -- was identified from the grade book of the instructor. This research involved the investigation of existing data, and the information obtained was recorded in a way to ensure anonymity and confidentiality of the subjects.

Descriptive and inferential statistics were used to analyze the data for individuals within two groups: (a) all students, and (b) those students receiving a C or better in the class (i.e., defined as "successful" for the purposes of this study). At the descriptive level, simple means and frequency distributions were employed. At the inferential level, Pearson product–moment correlation coefficients (Pearson r) were used to determine any statistically significant relationships ($p = <.05$) b etween each selected independent variable and the grade obtained in the online course. A regression analysis was performed to obtain an estimate of the percentage of variance within the grade a student receives as accounted for by the various independent variables.

Key Findings

Student Grade Profile (Dependent Variable)

Table 1 profiles the final grades received by the online students within this study. Of the 179 total students, 125 received a "C or better" (i.e., defined as successful); 11 received less than a C, but passed the class; 26 failed the class; and 17 withdrew (i.e., dropped the class). Thus 70% of the total students enrolled in this class received a C or better, while 24% were not successful or failed the class (and the other 6% passed the class, but received less than a C). This 24% failure/dropout rate is similar to other research depicting high dropout rates within online courses (Frankola, 2001; Oblendor, 2002).

Table 1. Student Grades ($n = 179$)

Grade	N	Percentage
A	30	16.8
A–	24	13.4
B+	21	11.7
B	21	11.7
B–	8	4.5
C+	8	4.5

C	13	7.3
C–	2	1.1
D+	2	1.1
D	5	2.8
D–	2	1.1
F	26	14.5
W	17	9.5
Total	179	100.0

Correlational Summary

The Pearson *r* was the correlation index used to measure the degree of relationship between the 13 independent variables and the dependent variable of grade in the online course. Table 2 summaries the resulting correlations, and whether they are significant or not (at the $p = <.05$ level). Results indicate that a statistically significant relationship exists within the overall student population between the student's grade and GPA, orientation attendance, previous withdrawals, ASSET Reading score, previous online courses taken, age, and ACT English score. Within the population of students who received a C or better, significant relationships were found between the grade received and their GPA, orientation attendance, previous withdrawals, age, and the semester format of the class. To assist the reader, Table 2 lists the variables in rank order for the overall student population, starting with those having the highest significance level.

Table 2. Pearson Correlation Coefficients
(Listed in Rank Order by Significance Level for All Students)

	All Students (*n* = 179)			Successful Students (*n* = 125)	
Independent Variable	*r*	Significance		*r*	Significance
1) GPA	.697	.000*		.617	.000*

2) Orientation Attendance	.338	.000*		.240	.012*
3) Previous Withdrawals	−.226	.002*		−.198	.027*
4) ASSET Reading	.307	.007*		.229	.145
5) Previous Online Courses	.177	.018*		.070	.438
6) Age	.157	.036*		.395	.000*
7) ACT English	.253	.046*		.240	.090
8) Student Status	.141	.061		.076	.402
9) Gender	.137	.068		.120	.184
10) ACT Composite	.189	.138		.111	.439
11) ACT Reading	.169	.184		.119	.407
12) Semester Format	.092	.220		.188	.036*
13) ASSET Writing	.121	.297		.063	.694

*$p = <.05$.

Individual Independent Variable Summary Analyses

Research results for each variable are reported in this section, following the significance level of their correlation coefficients.

1) Student GPA . A student's GPA was found to have the highest relationship to the final grade received in the on-line class, for both the overall student population ($r = .697$; $p = .000$), as well as within the successful student group ($r = .617$; $p = .000$). This means that generally the higher a given student's overall GPA, the higher his or her grade was in this online class.

2) Class Orientation Attendance . Participation in an optional orientation session prior to taking the online class had the second highest relationship to the final grade received in that class, for both the overall student population ($r = .338$; $p = .000$), as well as within the successful student

group (r = .240; p = .012). Data regarding this variable are presented in Table 3 .

Table 3. Orientation Attendance

	All Students (n = 179)		Successful Students (n = 125)	
Attended Orientation	N	Percentage	N	Percentage
Yes	107	59.8	92	73.6
No	32	17.8	17	13.6
Missing	40	22.4	16	12.8
Total	179	100.0	125	100.0
Pearson r	r = .338	p = .000*	r = .240	p = .012*

$* p = <.05.$

As the data reveals, attendance at these orientation sessions is associated with the grade a student receives in the course, in that students who attend the session have higher scores than those who do not.

3) Previous Course Withdrawals . The number of previous course withdrawals was the third most significant variable, with a negative correlation for both the general population (r = –0.226; p = .002), and the successful student population (r = –0.198; p = .027). This means that students with fewer previous course withdrawals had higher grades in the online course (as depicted in Table 4).

Table 4. Withdrawal From Previous Courses

	All Students (n = 179)		Successful Students (n = 125)	
Number of Withdrawals	N	Percentage	N	Percentage
0	94	52.5	72	57.6

1	30	16.8	23	18.4
2	17	9.5	8	6.4
3	9	5.0	3	2.4
4	9	5.0	7	5.6
5	7	3.9	3	2.4
6	5	2.8	3	2.4
7	2	1.1	2	1.6
8	1	.6	1	.8
9	1	.6	1	.8
10	2	1.1	1	.8
11	2	1.1	1	.8
Total	179	100.0	125	100.0
Pearson r	$r = -.226$	$p = .002*$	$r =-.198$	$p = .027*$

$* p = <.05.$

4) ASSET Reading Scores. Within the overall population, there was a statistical significant relationship between ASSET Reading scores and final grades in the online course ($r = .307$; $p = 007$), while this variable no longer served to distinguish their grades among those receiving a C or better ($r = .229$; $p = .145$). This means that the higher the ASSET Reading test score for the general population, the higher the grade in the course. But for those receiving a C or higher, this relationship did not exist (at least not at the 95% confidence level). Table 5 represents the ASSET Reading scores for the population of students in the online course.

Table 5. ASSET Reading Skills Scores

	All Students (n = 77)			Successful Students (n = 42)	
Classification of Score	N	Percentage		N	Percentage
0–39	19	24.7		8	19.0
40–43	16	20.8		6	14.3
44–53	42	54.5		28	54.5
Total	77	100.0		42	100.0
Pearson r	r = .307	p = .007*		r = .229	p = .145

$* p = <.05.$

5) *Previous Online Courses.* Table 6 represents completion of previous online courses at the community college. There were 68 students, representing 38% of the students registered for the course, who had not completed a previous online course. Within the successful group, 33.6% had not taken a previous online course.

Table 6. Completion of Previous Online Courses

	All Students (n = 179)			Successful Students (n = 125)	
Previous Online Courses	N	Percentage		N	Percentage
0	68	38.0		42	33.6
2	55	30.7		40	32.0
3	26	14.5		18	14.4
4	5	2.8		5	4.0

	All Students		Successful Students	
5	11	6.1	7	5.6
6	4	2.2	3	2.4
7	6	3.4	6	4.8
8	3	1.7	3	2.4
12	1	.6	1	.8
Total	179	100.0	125	100.0
Pearson r	$r = .177$	$p = .018*$	$r = .070$	$p = .438$

$* p = < .05.$

Within the overall population, there was a positive statistically significant relationship between the number of previous online courses taken and the grade received in this online course (r = .177; p = .018), while this variable no longer served to distinguish their grades among those receiving a C or better (r = 0.70; p = .438). This means that the more previous online courses a student enrolled in, the better the grade they received in this subsequent online course.

6) *Age.* The age of the student population is identified in Table 7. Students ranged in age from 16 years to 52 years of age.

Table 7. Age of Student Population

	All Students ($n = 179$)		Successful Students ($n = 125$)	
Classification of Age	N	Percentage	N	Percentage
Under 18	15	8.4	15	12.0
18–20	62	34.6	39	31.2
21–30	62	34.7	40	32.0

31–40	27	15.0	20	16.0
41–50	12	6.7	10	8.0
Over 50	1	.6	1	.8
Total	179	100.0	125	100.0
Pearson *r*	*r* = .157	*p* = .036*	*r* = .395	*p* = .000*

* p = <.05.

The average age of the online student in this study is 25 years old, which tends to be younger than those identified in previous studies (Dutton et al., 2002; Epper & Garn, 2003; Tucker, 2001; U.S. Department of Education, NCES, 2003). Instead, this finding corresponds to the work of Wallace (1996) that suggests the demographics of distance learners may be shifting to younger, more traditional college-aged, students.

Although the average age was younger than some previous studies, findings from this study show that the older the student, the higher the grade in the course. This was true for both the overall population (*r* = .157; *p* = .036), and those receiving a C or above (*r* = .395; *r* = .000). Conversely, the younger the student, the lower the grade in the course.

7) *ACT English Scores* . Table 8 represents the ACT English Skills scores received by the population of students in the online course . Similar to the findings for the ASSET Reading scores, within the overall population, there was statistical significant relationship between ACT English scores and final grades in the online course (*r* = .307; *p* = 007), but no such relationship was found within just the successful student population (*r* = .229; *p* = .145). This means that the higher the ACT English test score for the general population, the higher the grade in the course. But for those receiving a C or higher, this relationship no longer exists (at least not at the 95% confidence level).

Table 8. ACT English Skills Scores

	All Students (*n* = 63)		Successful Students (*n* = 51)	
Classification of Score	*N*	Percentage	*N*	Percentage
Under 16	11	17.5	6	11.8

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16–20	21	33.3		18	35.3
21–25	17	27.0		16	31.3
26–30	12	19.0		9	17.7
31–36	2	3.2		2	3.9
Total	63	100.0		51	100.0
Pearson *r*	*r* = .253	*p* = .046*		*r* = .240	*p* = .090

* $p = <.05$.

8) *Full or Part-time Status.* Following the definition used by the community college, the students in this study are classified as full-time if they are enrolled in 12 or more credits per semester. Table 9 summarizes the classification of students at the time they were enrolled in the on-line class studied, with the majority (74.3%) of students considered part-time. Data revealed that student status had no statistically significant relationship with the grade received in the online course for the overall population, nor for those deemed most successful .

Table 9. Student Status

	All Students (*n* = 179)			Successful Students (*n* = 125)	
Status	*N*	Percentage		*N*	Percentage
Part-time	133	74.3		98	78.4
Full-time	46	25.7		27	21.6
Total	179	100.0		125	100.0
Pearson *r*	*r* = .141	*p* = .061		*r* = .076	*p* = .402

9) *Gender* . Table 10 illustrates that the majority of the students (69.3%) in the study were female. Many studies indicate a larger proportion of female students enroll in the online

environment (Halsne & Gatta, 2002; Zirkle, 2003), and these findings support this conclusion.

No significant relationship, however, was found in this study between gender and the grade received in the online course.

Table 10. Gender of the Population

	All Students (n = 179)			Successful Students (n = 125)	
Gender	N	Percentage		N	Percentage
Male	55	30.7		34	27.2
Female	124	69.3		91	72.8
Total	179	100.0		125	100.0
Pearson r	r = .137	p = .068		r = .120	p = .184

10) *ACT Composite Score.* Table 11 represents the ACT Composite Skills scores by the population of students in the online course. There was no statistical significance relationship between ACT Composite scores and grades obtained in this online course, for both the overall population nor within these deemed most successful.

Table 11. ACT Composite Skills Scores

	All Students (n = 63)			Successful Students (n = 51)	
Classification of Score	N	Percentage		N	Percentage
Under 16	7	11.1		2	3.9
16–20	24	38.1		21	41.2
21–25	22	34.9		21	41.2
26–30	9	14.3		6	11.7

31–36	1	1.6		1	2.0
Total	63	100.0		51	100.0
Pearson *r*	*r* = .189	*p* = .138		*r* = .111	*p* = .439

11) ACT Reading Scores. Table 12 represents the ACT Reading scores by the population of students in the online course. There was no statistical significance relationship between with ACT Reading scores and grades received in this online course, for both the overall population nor within these deemed most successful.

Table 12. ACT Reading Skills Scores

	All Students (*n* = 63)			Successful Students (*n* = 51)	
Classification of Score	*N*	Percentage		*N*	Percentage
Under 16	8	12.7		6	11.8
16–20	22	34.9		16	31.3
21–25	22	34.9		20	39.3
26–30	5	8.0		4	7.8
31–36	6	9.5		5	9.8
Total	63	100.0		51	100.0
Pearson *r*	*r* = .167 .167.169307	*p* = .184		*r* = .119	*p* = .407

12) Semester Format . The online course was offered to students via either a 16-week fall and spring semester, or during an accelerated 8-week summer semester. The semester format when students took the online course is represented in Table 13.

Table 13. Semester Format Chosen by Students

	All Students ($n = 179$)			Successful Students ($n = 125$)	
Format	N	Percentage		N	Percentage
16 Week	117	65.4		80	64.0
8 Week	62	34.6		45	36.0
Total	179	100.0		125	100.0
Pearson r	$r = .092$	$p = .220$		$r = .188$	$P = .036*$

$* p = <.05.$

Overall, there was no statistical significance, $p = .220$, for the overall population of this study, but there is statistical significance for the successful students identified in this study, $p = .036$. This indicated that there is a relationship between the semester format selected for the class, and the grade received for those receiving a C or higher. This significant relationship may reflect that many "non-community college" students register for a shortened format in the summer while they are on break from their university studies.

13) ASSEST Writing Scores . Table 14 represents the ASSET Writing Skills scores by the population of students in the online course. Similar to the findings for the ACT Reading and Composite scores, there was no statistical significance relationship between with ASSET Writing scores and grades received in this online course, for both the overall population nor within these deemed most successful.

Table 14. ASSET Writing Skills Scores

	All Students ($n = 77$)			Successful Students ($n = 42$)	
Classification of Score	N	Percentage		N	Percentage
0–40	22	28.6		12	28.6
41–45	24	31.1		10	23.8

46–55	31	40.3	20	47.6
Total	77	100.0	42	100.0
Pearson *r*	*r* = .121	*P* = .220	*r* = .188	*p* = .036

Regression Analysis Summary

Finally, a linear regression analysis was performed to estimate the percentage of variance accounted for in the grade a student receives, using various independent variables. The goal of regression analysis is to create a predicting equation that comes close to representing reality without using more variables than necessary to make an accurate prediction of student success. This regression analysis was completed using two models. The first was to use all of the statistically significant variables, in the order of greatest significant first (i.e., number of previous withdrawals; ASSET Reading Scores; number of previous online courses, age, orientation attendance, and GPA). With these six independent variables, about 72% ($R^2 = 0.720$) of the variability in course grades could be accounted for.

The second model was to run the regression analysis with only the two most significant contributors (i.e., GPA and orientation attendance). A statistically significant $R^2 = .692$ was achieved, which means that approximately 69% of the variability in the resulting grade for the course could be accounted for by these two variables. This meant that using the four additional variables within the first model accounted for only 3% more predicting power. Thus the second model is the most useful in that it only requires access to two variables (rather than six) to obtain almost the same level of predicting power.

An equation to predict a given student's final grade course was thus created as follows: Final course grade = –0.529 + {0 if no orientation; .525 if orientation} + 1.011 * (GPA). This means that if a given student had attended the class orientation session and had a GPA of 2.0, the predicting equation would be: –0.529 + .525 + 1.011 * 2.0 = 2.018. Based upon this regression analysis and the resulting predicting equation, this student's final class grade would be 2.018.

Major Conclusions

This study examined the relationship between community college students' success in an online course and various student demographic and other learner characteristics. As noted previously, online courses often have high dropout or failure rates, and the interests of both students and the higher education institutions would be served by identifying characteristics of successful online students. Defining such characteristics could assist faculty and admissions personnel in guiding students to register for the course format best suited for them. With a variety of course venues available, it is important to select the format that provides the greatest opportunity for each individual student.

Previous research on online education indicated there is limited information on what accounts for individual student differences when taking online courses. This study explored the relationship between 13 different demographic or learner characteristics, and found strong connections

between a number of them.

Grade point average was found to have the strongest connection. This is not too surprising in that those with a stronger GPA in other classes also appear to do well in online classes, and this study helped to validate this natural conclusion. This finding is also similar to results from other previous studies. For example, Cheung and Kan (2002) found that previous academic achievement was positively and significantly related to student performance. Anderson and Benjamin (1994), indicated the higher the academic qualification obtained, the better the course result that students attained in a course. Moore and Kearsley (1996) found that distance learning students in general tend to have high grade point averages.

The second greatest factor was that of having attended an orientation session for the class. Other research studies had found that orientation sessions help create a sense of connection and commitment to a given class (Robinson, Burns, & Gaw, 1996). However, no other studies were found that had examined this issue for online courses. Yet, the strong connection between success in this online class, and having attended the optional orientation session should cause individuals at this community college (and perhaps elsewhere) to consider making such attendance mandatory. Particularly if a given student has a lower GPA, or exhibited other characteristics that this study revealed as a link to lower success (i.e., low ASSET Reading scores; low ACT English scores; high number of previous withdrawals). And if face-to-face orientations sessions are not viable, then other means to share the elements covered at such sessions must be explored (i.e., video-streaming).

The third strongest correlation involves the number of previous withdrawals from other classes. Other research studies have also documented the large number of withdrawals from within online classes, when compared to students in face-to-face classrooms (Dutton et al., 2002; Phipps & Merisotis, 1999). However, no studies were found that examined connections between any previous course withdrawals (whether in online or traditional classes) and future success in other courses. Once again, the strong connection found within this study is of note.

The fourth strongest correlation was between a student's ASSET Reading scores and their final grade in the on-line course. This was statistically significant for the overall population, although this variable no longer served to distinguish grades among those receiving a C or better. This means that a student's ASSET Reading score could be used to predict whether a student would get at least a C or better in this on-line class, but not the specific grade above that C.

Previous research studies have usually focused on comparing achievement test scores of online students with those in traditional courses, rather than trying to determine if previous achievement scores are a predictor of success within a given online class. For example, Gubernick and Ebeling (1997), found that online students scored from 5 to 10% higher on achievement tests than did students in the face-to-face course, although others have found no significant differences in achievement test scores for these two groups (Freeman, 1995; Mortensen, 1995). One study, however, did indicate a correlation between the literacy level of the student and their success (Phipps & Merisotis, 1999). The strong link between the ASSET Reading scores in this study adds further support to that finding.

There was also a positive and statistically significant relationship between previous online courses and the grade in the course (the fifth most significant). These results are in line with several other research findings whereby the number of online education courses previously completed were related to future success in online education (Ehrman, 1990; Eisenberg & Dowsett, 1990; Moore & Kearsley, 1996). These studies found that first time students often

lacked the necessary independence and time management skills needed for persistence.

While studies have indicated that the web can serve as a powerful learning tool, they also indicate that the students in the online format require a certain level of computer literacy (Dutton et al., 2002; Halsne & Gratta, 2002). Such computer literacy can be obtained from previous online courses. Or if previous online courses have not been completed, it might be beneficial to provide new students an opportunity to complete a prerequisite technology course or seminar. This would especially be true if such students also exhibit other characteristics that this study found related to lower success rates in this online course (such as low GPA, many previous withdrawals, lower ASSET and ACT scores).

The age of the student was also found to be of significance when examined in relation to the grade received in the online class (the sixth most significant). Overall, the younger the student, the lower the grade. This supports some other previous research that found age of an online student is related to course completion. For example, Willis (1992) found that students over 30 and less than 50 years of age are most likely to successfully complete an online course, and Didia and Hasnat (1998) found the older a student was, the better he or she performed.

Of interest should be that the average age of the 179 students enrolled in the online course examined for this study was 25 years, which is younger than those identified in many previous studies (e.g., U.S. Department of Education, NCES, 2003). This suggests that the demographics of distance-learners may be shifting to younger, more traditional students, yet these younger students tend not to do as well in these classes. A key question is what advising is currently offered to such students as they make decisions regarding such classes?

Overall, the online learning environment is quite different from a traditional classroom. High dropout or failure rates have been established for these courses, at great cost to students and higher education institutions. This study reveals that some commonly available data could be used to guide students into making appropriate course selections. A standardized set of guidelines could be constructed that require attendance at a orientation session, or block a student from taking the online version at all (if many of the "bad" characteristics were in place, and if a more traditional format was available). No one wants to prevent students from taking their choice of classes, but prerequisites are already in place for many higher education courses, and placement tests are commonly used to place students into remedial and other courses. Results from this study indicate that a set of uniform prerequisites could be created for this online class as well to help enhance student success rates.

Online courses will continue to be popular for higher education students and have the potential to meet the needs of more individuals. Yet due to high dropout rates in such courses, it is imperative that students most likely to succeed be directed into these courses (especially for the younger student who may chose this format without much thought). This research has generated a better understanding of the factors influencing student performance in online courses, and may prove valuable to those involved with administering such programs.

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