
Attrition in Online and Campus Degree Programs

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Abstract

The purpose of this study was to examine how the mode of instructional delivery, campus face-to-face or online, affected dropout relative to students' academic and demographic characteristics. A quantitative study was conducted to analyze the academic and demographic characteristics of newly admitted, matriculated degree-seeking students ($N = 640$) from Fall 2002 to Fall 2004 in the Master's of Business Administration and Master's in Communication Sciences and Disorders at a national research university in the southeastern United States. Demographic variables analyzed were age, gender, and ethnicity. Academic variables analyzed were program delivery mode, undergraduate grade point average, graduate grade point average at time of dropout or completion, admission test scores, and number of terms to degree completion or number of courses completed at time of dropout.

Results of the study found that online students were significantly more likely to dropout than campus based students. Age was found to have a significant unique affect on dropout in both programs with older students more likely to dropout. Academic and demographic variables were not found to be significantly associated with dropout in the online formats of either program. Variables related to dropout for the campus based groups of both programs differed. Campus MBA students who dropped out were older and had higher GMAT scores while campus CSDI students who dropped out had lower undergraduate GPA's and GRE scores. Logistic regression analyses showed age and delivery format to have significant unique effects beyond other predictors on dropout in the MBA program overall while age and undergraduate GPA had significant unique effects beyond other predictors on dropout for the CSDI program.

Introduction

To provide greater access to students and to meet market demands, institutions of higher education are adopting online delivery of instruction at the course and program level at a rapid pace. Offering benefits to both students and institutions, online instruction has become a very attractive choice for teaching and learning. According to a recent survey, almost 3.9 million students were enrolled in at least one online class during the fall of 2007. The 12.9% growth rate for online enrollment is much greater than the 1.2% growth overall of the higher education student population (Allen & Seaman, 2008).

The accelerated growth of online instruction has been accompanied by questions of quality in terms of outcomes. One measure of program quality and effectiveness is program completion rates. Although studies have shown the effectiveness of instruction in the online environment to be comparable to that of the traditional classroom environment (Russell, (2001), studies and anecdotal evidence indicate high attrition rates for online courses, often much higher than for campus courses (Bos & Shami, 2006; Diaz & Cartnal, 2006; Rovai, 2003; Willging & Johnson, 2004). Adult students have been reported to have lower retention rates in campus programs than traditional aged students which has implications for distance education programs since enrollment in these programs is predominantly adult students, particularly at the graduate level (Rovai).

Institutions are being held increasingly accountable to legislative bodies, governing boards, and the

federal government with respect to program outcomes, one of which is program completion rates. It is important for institutions to report high retention rates in order to secure funding. Institutions continue to believe that distance education is “critical” to their long-term strategy and survival (Allen & Seaman, 2008).

Methodology

The purpose of this study was to examine how the mode of instructional delivery, campus face-to-face or online, affected dropout relative to students’ academic and demographic characteristics. Specifically, this study answered the following research questions:

1. To what extent does the dropout rate vary by instructional delivery mode, online versus campus face-to-face, for each selected master’s degree program?
2. What are the demographic and academic characteristics significantly associated with student persistence or dropout in master’s degree programs?
3. How do the demographic and academic variables significantly associated with student dropout differ between the two delivery modes, online versus face-to-face?

A quantitative study was conducted to analyze the academic and demographic characteristics of newly admitted, matriculated degree-seeking students ($N = 640$) from Fall 2002 to Fall 2004 in the Master’s of Business Administration and Master’s in Communication Sciences and Disorders at a national research university in the southeastern United States. Demographic variables analyzed were age, gender, and ethnicity. Academic variables analyzed were program delivery mode, undergraduate grade point average, graduate grade point average at time of dropout or completion, admission test scores, and number of terms to degree completion or number of courses completed at time of dropout.

The campus and online formats of the programs were for the most part identical with the exception of delivery mode. The online and campus formats of each of the selected programs were based in the same academic departments and utilized the same professors, curriculum, assignments, campus technology and infrastructure and campus academic support services; thereby, offering some degree of control for intervening program, instructional, and institutional variables.

The researchers studied individual student enrollment records in the student database and determined student enrollment status (completer-obtained degree within the time frame; persister-did not achieve degree completion but continued enrollment without being out for more than one academic term; or dropout – initially admitted and enrolled during the study but were not enrolled at the conclusion and who had not been enrolled for two consecutive academic terms). Students were classified as online students if more than 50% of their completed courses were delivered online and students were classified as campus students if more than 50% of their courses were on campus in face-to-face classes. If a student had an equal number of classes in each format, the number of credit hours attempted on each campus were used to determine the primary campus of enrollment.

Findings

Analysis of Data

In the study, the dichotomous criterion variable was student persistence versus dropout. The predictor variables were gender, age, ethnicity, undergraduate GPA, admission test scores, and mode of instructional delivery. These data were analyzed using descriptive statistics as well as a series of *t*-tests, chi-square tests, and logistic regression.

Descriptive statistics were calculated by program delivery format for the criterion variable,

persistence or dropout, and the predictor variables: age, gender, ethnicity, undergraduate grade point average (GPA), and admissions test scores. *T*-tests of independent samples and chi-square tests examining the relationship between student outcome and the predictor variables of age, gender, ethnicity, undergraduate grade point average (GPA), graduate admissions test scores, and program delivery format were calculated followed by the logistic regression analysis. A significance level of .05 was employed in all statistical tests.

Research Questions and Findings

1. To what extent do dropout rates vary by program delivery mode, online vs. campus face-to-face, for master's degree programs?

This study found a statistically significant difference in the dropout rate according to the delivery mode, online or campus, for the two degree programs. The dropout rate was significantly higher for the online formats than the campus based formats of the two degree programs. With an overall dropout rate of 20.3% for the entire MBA sample, 11% of the campus based MBA students dropped out as compared to 43% of the online MBA students. The dropout rate for the entire CSDI sample was 9.7% with 4% of the campus based students dropping out as compared to 23.5% of the online students. Online MBA students were six times more likely to drop out than campus MBA students and online CSDI students were seven times more likely to drop out than campus CSDI students. Table 1 presents the frequency of persistence/dropout by ethnicity, gender, and program delivery format for the overall MBA sample. There was no significant association between ethnicity and persistence, $\chi^2(2, N = 516) = 1.302, p = .522, \Phi_c = .050$.

Table 1

MBA Population – Student Outcome by Ethnicity, Gender, and Program Format

Variables	Persisters		Dropouts	
	<i>N</i>	%	<i>N</i>	%
Ethnicity				
White	318	79.7*	81	20.3*
Black	43	84.3*	8	15.7*
Other	50	75.8*	16	24.2*
Gender				
Female	164	78.1**	46	21.9**
Male	247	80.7**	59	19.3**
Program Format				
On Campus	325	88.8	41	11.2
Online	86	57.3	64	42.7
Total Group	411	79.7	105	20.3

Note. *N* = 516 total MBA students. *Percent within race. **Percent within gender.

The percentage of men dropping out (19%) was similar to the percentage of women dropping out (22%). Persistence was also not significantly related to gender, $\chi^2(1, N=516) = .529, p = .465, \Phi_c = .03$, odds ratio = 1.17. Online students quit significantly more often (42.7%) than campus students (11.2%), $\chi^2(1, N=516) = 64.988, p < .001$, odds ratio = 5.90.

Table 2 presents the frequency of persistence/dropout by ethnicity, gender, and program delivery format for the total CSDI sample. A greater percentage of Blacks dropped out (40%) than Whites (9%) or other ethnicities (.0%). A significant difference in the proportion of persistence and dropout by ethnicity was shown, $\chi^2(2, N=124) = 6.267, p = .044, \Phi_c = .225$. To obtain a more precise measure, chi-squares tests were used to examine the relationship between student dropout and ethnicity using only two ethnic categories: “Black” and “not Black” (White combined with other ethnicities). The chi-square test indicated the relationship between student outcome and Black ethnicity to be significant, $\chi^2(1, N=124) = 5.481, p = .019$, with the odds of dropping out being 7.3 times higher among Black students than among other students.

Table 2

CSDI Population – Student Outcome by Ethnicity, Gender, and Program Format

Variables	Persisters		Dropouts	
	N	%	N	%
Ethnicity				
White	100	90.9*	10	9.1*
Black	3	60.0*	2	40.0*
Other	9	100.0	0	0.0
Gender				
Female	8	100.0**	0	0.0**
Male	104	89.7**	12	10.3**
Campus				
On-Campus	86	95.6	4	4.4
Online	26	76.5	8	23.5
Total Population	112	90.3	12	9.7

Note. N = 124 Total CSDI Students. *Percent within ethnicity. **Percent within gender.

2. What demographic and academic characteristics are significantly associated with dropout in master’s degree programs?

The analysis of data for all MBA students, online and campus, showed age and program delivery format to be significantly associated with dropout. An examination of the characteristics of dropouts and persisters showed that dropouts were significantly older than persisters and online students dropped out significantly more often than campus MBA students. The logistic regression analysis showed that age and delivery format have significant unique effects on dropout when all other variables are held constant.

For the MBA degree program, 71% were classified as campus students and 29% were classified as online students. Of this group, 79.7% completed/persisted and 20.3% dropped out. Of the 516 cases, 59% were male students and 41% were female students. The sample consisted of 77% Whites, 10% Blacks, and 13% other ethnicities. The mean age of the MBA population was 29.7. The mean undergraduate GPA for the population was 3.14 and the mean GMAT score was 499.

For the total MBA population, two-tailed *t* tests of independent samples were conducted to examine the relationship between student outcome (persistence/dropout) and age, Graduate Management Admissions Test (GMAT) score, and undergraduate GPA. Students who dropped out were found to be significantly older than persisters. The difference between the mean undergraduate GPA of those students who persisted was not significantly different from that of students who dropped out. The *t*-tests results indicated no significant differences in mean GMAT scores of those who persisted. Chi-square tests with two-way contingency table analysis using cross-tabulations were performed to examine the relationship between student outcome (persistence or dropout) and gender, ethnicity, and program delivery format. There was no significant association between ethnicity and persistence. The percentage of men dropping out (19%) was similar to the percentage of women dropping out (22%). Persistence was also not significantly related to gender. Online students quit significantly more often (42.7%) than campus students (11.2%).

For the CSDI degree program, 73% were classified as campus students and 27% were classified as online students. Of this sample, 90.3% persisted and 9.7% dropped out. Of the 124 students, 6% were male students and 94% were female students. The sample's ethnic composition was 89% White students, 4% Black students, and 7% other ethnicities. The mean age of the students was 28.7. The mean undergraduate GPA for the group was 3.328 and the mean Graduate Records Examination (GRE) score was 939.

For the CSDI master's degree program, age, undergraduate GPA, ethnicity, and program delivery format were found to be significantly associated with dropout for the entire CSDI sample. Students who dropped out were found to be significantly older and had lower undergraduate GPA's than persisters. Blacks were significantly more likely to dropout of the program than other ethnicities. Online students quit significantly more often than campus students (see Table 2). As shown in Table 3, the logistic regression analysis found only age and undergraduate GPA to have significant unique effects when all other variables were held constant.

Table 3

CSDI Population – Logistic Regression Predicting Decision Demographics and Academic Variables

Predictor	<i>B</i>	Waldx2	<i>P</i>	Odds Ratio
GPA	-3.463	5.805	.016*	.031
GRE	.001	.128	.721	1.001
Campus	.722	.443	.506	2.058
Gender	20.172	.000	.999	6E+008
Age-nr	158.629	4.684	.030*	7.8E+068
Black	19.546	.000	.999	3E+008
White	19.386	.000	.999	3E+008
Constant	-26.627	.000	.999	000

Note. **p* < .05.

When analyzing the findings for both programs, age and program delivery format were found to be significantly associated with dropout in both programs. The only variable found by the logistic regression to have a significant unique effect on dropout in both programs was age.

3. How do the demographic and academic variables significantly associated with student dropout differ between the two delivery modes, online vs. campus face-to-face?

Campus based MBA subgroup. Of 366 campus based students, 89% persisted and 11% dropped out. *T*-tests of independent group means and chi-square tests were performed to examine the relationship between the outcome variable (student persistence or dropout) and the predictor variables of age, gender, ethnicity, undergraduate GPA, and GMAT scores for the campus delivery mode.

For the on-campus students, mean GPA of persisters did not differ significantly from that for those who dropped out. However, the *t*-tests results showed that the mean GMAT score of campus students who dropped out was significantly higher than that of those who persisted (see Table 4). The mean age of campus students who dropped out was significantly higher than the mean age of those who persisted.

Table 4

Campus-Based MBA Group – Means and Standard Deviations of GPA, GMAT, and Age

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
GPA			
Persisters	316	3.127	.4036
Dropouts	32	3.076	.4777
GMAT			
Persisters	322	491.93	63.192
Dropouts	37	522.43	66.642
Age			
Persisters	325	28.10	4.519
Dropouts	41	32.07	7.121

Note. *N* = 366 campus based MBA students.

Two-way contingency table analyses indicated that the occurrence of persistence and dropout across ethnicities was about the same. Approximately 11% of White students dropped out, 8% of Black students dropped out, and 15% of students from other ethnicities dropped out. The percentage of male students and female students persisting and dropping out of the campus program were almost the same. Of 224 male students, 11.2% dropped out. Of 142 female students, 11.3% dropped out.

Campus based CSDI subgroup. Of 90 campus based students, 96% persisted and 4% dropped out. For the on-campus students, the mean undergraduate GPA of persisters was significantly higher than the mean GPA of those who dropped out. *T*-test results showed that the mean GRE score of campus students who persisted was significantly higher than the mean score of those who dropped out. The mean age of campus students who persisted did not differ significantly. The percentage of men

(100%) and women (95.2%) persisting and dropping out of the campus track were not significantly different. The data indicated no significant differences in the occurrence of persistence and dropout across ethnicities. Approximately 4.7% of White students dropped out and 0.0% of Blacks and students from other ethnicities dropped out.

Online MBA subgroup. Of 150 online students, 43% dropped out. For the online students, the mean GPA of persisters did not differ significantly from that of those who dropped out. *T*-tests results showed that the mean GMAT scores of the persisters did not differ significantly from that of those who dropped out. No significant difference was found between the mean ages of those who persisted and those who dropped out (see Tables 5 and 6).

Two-way contingency table analyses indicated that approximately 42% of White students dropped out, 36% of Black students dropped out, and 50% of students from other ethnicities dropped out. There was no significant difference found in the percentage of male students and female students persisting or dropping out. Forty-two percent of the male students dropped out and 44% of the female students dropped out.

Online CSDI subgroup. Of 34 online students, 76.5% persisted and 23.5% dropped out. For online students, the mean undergraduate GPA for persisters did not differ significantly from the mean GPA of those who dropped out. The mean GRE score of persisters did not differ significantly from that of those who dropped out. The mean age of those online students who persisted and those who dropped out were not found to be significantly different.

Two-way contingency table analyses indicated that approximately 24% of White students dropped out, 66.7% of Black students dropped out, and 0.0% of students from other ethnicities dropped out. Although no significant difference in the occurrence of dropout by ethnicity was indicated by the chi-square tests, the test included so few Blacks that the test had very little statistical power. There was a greater percentage of males persisters (100%) than female persisters (75%); however, the results of the chi-square tests indicated the difference was not statistically significant.

Table 5

Online MBA Group – Means and Standard Deviations for GPA, GMAT, and Age

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
GPA			
Persisters	78	3.203	.432
Dropouts	61	3.143	.406
GMAT			
Persisters	83	514.34	84.366
Dropouts	64	502.03	70.512
Age			
Persisters	86	31.99	5.888
Dropouts	64	33.08	6.711

Note. *N* = 150 online MBA students.

Table 6

Online MBA Group – Outcome by Gender and Ethnicity

Variables	Persisters		Dropouts	
	<i>N</i>	%	<i>N</i>	%
Gender				
Female	38	55.9*	30	44.1*
Male	48	58.5*	34	41.5*
Ethnicity				
White	68	57.6**	50	42.4**
Black	9	64.3**	5	35.7**
Other	9	50.0**	9	50.0**
Total Count	86	57.3	64	42.7

Note. *N* = 150 online MBA students. *Percent within gender. **Percent within ethnicity.

A binary logistic regression analysis was performed to predict the probability of a student dropping out of the CSDI program. Student outcome (persistence or dropout) was the criterion variable. The predictor variables were undergraduate GPA, GRE score, program delivery format, gender, race, and age. A test of the full model with all predictors versus a constant-only model was statistically significant. The overall correct classification rate for the model was 91.5%. Employing a .05 criterion of statistical significance, age and undergraduate GPA have significant unique effects for predicting persistence. According to the Wald criterion, GPA had a significant effect although campus does not have a significant effect. When examining the frequency of dropout by mode of delivery, the bivariate analysis indicated that online students quit significantly more often than campus students; however, the logistic regression results indicate that the mode of delivery has no significant effect when GPA, GRE, gender, age, and ethnicity are held constant. For the online students in both the MBA program and the CSDI program, no statistically significant association was found between dropout and any of the predictor variables, age, gender, ethnicity, undergraduate GPA and admissions test score.

Summary and Conclusions

Summary

In this study, attrition was shown to be significantly higher in the online master's degree tracks than the comparable campus based formats of the same degree programs. The logistic regression analyses showed that for the MBA program, age and method of program delivery were the variables having a significant unique effect on dropout. For the CSDI program, the logistic regression analysis found age and undergraduate GPA to have a significant unique effect on dropout. The selected academic and demographic variables investigated were not found to be significantly related to dropout in the online tracks of either degree program, although certain of the academics and demographic variables were associated with dropout in the campus based tracks. Age was the only variable found to have a significant, unique effect on dropout in both degree programs overall.

Based on the literature review and this research, several conclusions were drawn. Findings must be

interpreted with caution based on the limitations of the study.

The study's findings are limited by several factors:

1. The study population is limited to graduate students enrolled in selected master's degree program at one site and may not be representative of other institutions and programs; thereby, limiting the generalizability;
2. The students self-selected in the type of program delivery format limiting the validity of study results;
3. Participants in the study belonged to an intact group and were not randomly selected; and
4. The interpretation of the data collected is limited by survival time issues or censored data, meaning that the students persisting may drop out at a later time after the study ended or that students identified as dropouts may at some time in the future reenroll in the degree program (Tabachnick & Fidell, 2001).

Conclusions

Conclusions drawn from the study are stated below followed by a brief discussion of each.

1. *Online program delivery is a viable method of delivery offering unprecedented access to higher education; however the attrition rates in online programs found by this study suggest that attrition in online program formats remains an issue and challenge warranting the attention of educational leaders in program planning and development.* This study confirms previous research by revealing a significant difference between campus and online student dropout rates. In addition, this study strengthens the claim by comparing online and campus cohorts from the same degree programs at the same institution. Online MBA students were six times more likely to drop out than campus MBA students and online CSDI students were seven times more likely to drop out than campus CSDI students.
2. *The influence of academic and social integration on student dropout may vary across different degree programs and delivery formats.*

The study's findings do seem to indicate that academic integration as indexed by the variables of undergraduate GPA and admission test scores may have a greater influence on the persistence of campus students than online students. As indicated by the study, online persisters and online dropouts did not differ significantly on academic variables in either degree program. This supports the possibility that other factors beyond student characteristics such as situational factors external to the individual and instructor may be impacting dropout, thus lending support to the earlier findings of Rovai (2003) and Yorke (2004). Students in the online cohorts were significantly older than those in the campus cohorts so one might assume that the higher dropout rate is possibly a result of an older student population with greater family obligations and job responsibilities. Based on their survey research, Allen and Seaman (2008) reported that there was evidence that online students are older, have additional job obligations and family responsibilities than students in face-to-face campus classes.

A significant positive relationship was found between student GPA and GRE scores and persistence in the campus track of the CSDI program; here again emphasizing that academic variables may play a large role for younger, campus students than for the online students that are typically older.

3. *High dropout rates have been viewed as an indicator of program quality; however, the findings of this study suggest that dropout rates may be explained by other factors as well.*

As suggested by Diaz (2002) high drop out rates do not necessarily have to suggest academic

non-success, if we define success as student grades rather than the decision to dropout or persist. Even though they did not earn a degree, students may leave a program with increased knowledge and skills. Dropping out of the program could possibly be the best academic option in some students' situations if work and family obligations are interfering with their academic performance.

This study has examined professional master's degree programs, programs that by their nature provide training for entry or advancement in particular professions. Career motivations factor into students' decisions to enroll in professional master's degree programs and the findings of this study also suggest that these same motivations may play a part in their decision to persist or dropout. The differences in the dropout rates between the two degree programs may be partially explained by the career motivations of these students and the professional requirements for these two fields. MBA students may be able to advance professionally as they progress through the program without advancement hinging on the degree. For CSDI students, advancement in the profession is more apt to be contingent upon advanced licensure or certification that requires degree completion. This finding also supports Moore and Kearsley's (2005) claim that a student's reason for taking a course is positively related to success and one would assume persistence. Different motivating factors may be at play in different programs.

- 4. The sizable difference in the dropout rate between the two degree programs' online tracks suggests that there may be particular program specific characteristics affecting attrition.*

A closer examination of the two programs revealed that the curriculum of the online CSDI is sequential. Students are admitted only in the fall and progress through required courses together as a cohort. In the MBA curriculum, many or most courses do not have to be taken sequentially and a rolling admissions policy is in place with new students admitted every term. Therefore, the CSDI students have more of a true cohort experience. Prior research has shown the cohort experience to positively affect retention. In addition, a two-day face-to-face orientation is required for online students in the CSDI program which is arranged off-site if necessary. Thus, this degree program has another component that has been found to be positively related to student retention.

- 5. Dropout seems to result from an interaction of many complex variables that are difficult to delineate and determine, particularly in online environments, hence making it difficult for one comprehensive theory of dropout to fully explain the phenomenon in all situations or settings.*

The findings of this study validate the conclusion of other researchers that no one reason or theory adequately explains the attrition puzzle (Reynolds & Weagley, 2003; Willging & Johnson, 2004). The study's findings show that factors associated with dropout vary according to degree program and delivery formats. Furthermore, when examining just the online cohorts, none of the selected academic and demographic variables are shown to have a significant association; thus still leaving unanswered questions about the nature and causes of student attrition in online programs.

A major implication for practice is the importance of recognizing the extent of dropout and the challenge it presents as well as being sensitive to particular program specific characteristics possibly impacting dropout when engaging in program planning and enrollment management. A second major implication for practice based on the relationship of age to dropout is the importance of addressing the needs of older, adult students when planning programs and designing instruction.

Recommendations for future research include: (1) qualitative studies to learn students' reasons for dropping out and perceived barriers to persisting, (2) further study of program specific characteristics that may impact attrition, (3) an investigation of factors associated with dropout in online undergraduate degree programs, and (4) additional research to test the effect of different types of online communication tools used to facilitate interaction and dialog in online classes on student retention.

References

Allen, I. E., & Seaman, J. (2008). *Online nation: Five years of growth in online learning*. Retrieved August 27, 2008, from <http://www.sloan-c.org/resources/onlinenation.pdf>

Bos, N., & Shami, N. S. (2006, October). Adapting a face-to-face role-playing simulation for online play. *Educational Technology Research and Development*, 54, 493. Washington: DC. Retrieved January 11, 2007, from ProQuest database.

Diaz, D. P. (2002, May/June). *Online drop rates revisited*. The Technology Source. Retrieved December 6, 2006, from http://technologysource.org/article/online_drop_rates_revisited/

Diaz, D., & Cartnal, R. (2006). Term length as an indicator of attrition in online learning. Retrieved July 9, 2006, from <http://www.innovateonline.info/index.php?view:article&id=196>

Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view* (2nd Ed.). Belmont, CA: Wadsworth.

Reynolds, L., & Weagley, R. (2003). Academic persistence in higher education. *Consumer Interests Annual*, 49. Retrieved March 20, 2006, from the EBSCOHOST database.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *The Internet and Higher Education*, 6(1), 1-16. Retrieved March 20, 2006, from the ScienceDirect database.

Russell, T. (2001). *The no significant difference phenomenon*. Raleigh, NC: North Carolina State University.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics*. Boston: Allyn and Bacon.

Willging, P. A., & Johnson, S. D. (2004). Factors that influence students' decision to dropout of online courses. *Journal of Asynchronous Learning Networks*, 8(4), 2-15. Retrieved February 23, 2006, from http://www.aln.org/publications/jaln/v8n4_willging.asp

Yorke, M. (2004). Retention, persistence, and success in on-campus higher Education, and their enhancement in open and distance learning. *Open Learning*. 19 (1), 19-32. Retrieved April 12, 2006, from EBSCOHOST research database.