Examining Student Readiness for Upper Division Coursework

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This study examines student readiness for an upper division finance course by examining performance on topics that form the prerequisite knowledge. The data consist of assessment results from a multiple-choice questionnaire given to students at the beginning of the course. Regression variables include test results, location of prerequisite course, and months lapsed since completion of prerequisite course. The prerequisite locations are traceable to three institutions and include one four-year institution and two, two-year institutions. Overall mean student performance is low: 3.93/6.00, 65.5%, native students outperform transfer students by an average of 10%. For the total sample, time lapse is not significant, but interactive terms are negative and significant for students at two-year institutions indicating the possibility of a "forgetting variable." A case is made for identifying gaps and improving student readiness for all upper division finance course work requiring prerequisite knowledge.

Keywords: prerequisites; retention; transfer students; native students; transfer phenomena; transfer shock; accounting education; community college; academic performance; readiness; transfer ecstasy.

Data Availability: Data are available from the authors.

INTRODUCTION

This study provides empirical data on student readiness for upper division coursework. Data consist of assessment performance results from an accounting diagnostic tool given to students during the first week of class. Results indicate that all students perform poorly. Native students outperform transfer students by approximately 10% and the number of months since completing the principles level course in accounting has a significant impact on students transferring from two-year colleges (average of 18 months). All students are evaluated at the same time, the same location, by the same faculty and have met the stated prerequisites to enroll in the course.

Controlling for transfer students in the sample provides needed perspective in understanding student readiness for upper division coursework. There are unique challenges that impact transfer student success. Many transfer students received transfer credit for lower division prerequisite courses which may differ in rigor and timing. Many two-year programs require students to take the principles of accounting course(s) in their freshmen year compared to many four-year programs that require the same set of courses in their sophomore year. The time lag is important as students tend to forget critical aspects if too much time has expired between courses that serve as prerequisite knowledge for upper division course work in both accounting and finance.

This paper's impact on the literature is unique in that is suggests a mechanism to test student readiness for upper division course work by assessing student performance on five identified learning objectives. The accounting diagnostic tool can be used by those seeking to more fully understand student preparation for upper division coursework. Students in the sample are from three different colleges and therefore receive differing prerequisite preparation at differing points in time. This study provides a process for analyzing these differences to better understand student readiness.

Early assessment of pre-requisite knowledge allows for timely remediation and improves student and faculty awareness of potential performance issues. Future research includes stronger evidence on the relevance of the time lag between courses, stronger evidence on student knowledge and skills, and the potential for improvements in course alignment through the use of common learning objectives between prerequisite and upper division course work. The process used to improve student readiness may serve as a model to help all students improve their pass-rates and improve graduation completion rates.

The remainder of the paper is organized into four major sections as follows: literature review and hypothesis development, assessment tool, data and methodology, results, and conclusions.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Pre-requisite literature

There is a sizable literature that examines the study of prerequisite knowledge and its impact on the ability to acquire new knowledge (Amadieu et al. 2009; Choudhury et al. 2007, Jones and Roberts 2005; Anderson et al. 1990). Research has found that the quality of new learning depends on more than just the series of known facts (Dreyfus and Dreyfus, 2005). Clearly, the prerequisites include an understanding of the basic rules and facts, but new learning requires higher order skill development; integrating facts, evaluating results and strategic problem solving. Expert development progresses along this path (Dreyfus and Dreyfus, 2005). Jones and Roberts (2005) survey students and find that students who enter upper division course work without the necessary prerequisite knowledge and skills struggle to keep up and fall behind. They also find that students value reinforcement of prerequisite knowledge through the use of practice sets and review materials. The extent of the problem emphasizes the need for educators to consider reinforcement of the prerequisite knowledge prior to introducing new material. Sargent (2013) finds that success depends on adequate prerequisite development and tutoring. Students complete a pre-test assessment to gauge readiness for upper division coursework and then develop a plan to remedy deficits using an online tutorial. Sargent (2013) found student performance in upper division course work improved as a result of the online tutorial and these results persist in later coursework.

Transfer literature

Many students opt to begin their business education at two-year colleges and then transfer to four-year comprehensive universities. It is difficult for administrators to determine the rigor of the introductory accounting courses at feeder schools for assigning transfer credits. The use of minimum grades and other pre-requisite filters can create frustrations for feeder schools and the use of these types of measures doesn't always predict student success (Hicks and Richardson, 1984). In addition, there are timing differences in the sequencing of foundation courses. At many two-year colleges, Principles of Accounting is taken during the freshmen year and at most four-year institutions, Principles of Accounting is taken during the sophomore year.

There are many studies that evaluate aspects of the transfer process. One of the earliest studies (Hill, 1965) is known for having coined the term transfer shock which describes a temporary drop in student grades during their first and second semester after transferring to a four-year institution. Several studies have examined this theory and agreement exists that this trend seems to disappear after the first year. The resultant rise in performance is then referred to as transfer ecstasy (Diaz, 1992; Laanan, 2001). Demographic factors such as gender, race and ethnicity, age, and income have been studied and sometimes have moderating effects on the results. For instance, female transfer students earn higher grades than female native students and females outperform males at both levels. African American transfer students earned slightly higher grades than African American native students. Age makes a difference as well. Students age twenty-five and older experienced very little transfer shock (Durio, Helmick & Slover, 1982; Keeley & House, 1993). Students who transfer as juniors rather than as freshmen or sophomores, have higher graduation rates and recover from transfer shock more quickly. (House, 1989).

Carlan & Byxbe (2000) found that business transfer students experience the greatest amount of transfer shock in their first semester at the new school, and the resulting GPAs of transfer students were significantly lower than those of native students at the same level. Using data from three universities, Colley et al. (1996) found that native students at all three schools scored higher in their intermediate accounting courses for each one letter grade increase in the average principles class. Transfer students at all three universities didn't fare as well. Only one of the three universities scored higher in their intermediate accounting courses for each one letter grade increase in the average principles class. Laband et al. (1997) found that even when the mean score of transfer students for principles-level accounting classes was higher than native students, the native students outperformed transfer students in upper-division courses. They attributed this to grade inflation at the two-year schools.

Schmidt & Wartick (2013) also document the existence of grade inflation. They found the mean GPA of transfer students was higher than native students in principles-level accounting courses, but native students outperformed transfer students at the intermediate-level. Further, they found the lower performance may be attributable to the time since taking principles level accounting when the average time lag was greater than two years. They also discover that the difference between the scores of native and transfer students narrow in later courses such as auditing, income tax, and accounting information systems, but it does not entirely disappear.

Jones, et al. (2013) use data from four intermediate business courses (intermediate microeconomics, intermediate macroeconomics, intermediate business statistics, and intermediate financial accounting I) and find that student performance is determined by the academic quality of the student (measured as GPA) rather than the institution. They believe the principles level institution, and the grade in principles level courses, do not play a significant role in determining student performance in upper division coursework. Shortcomings of this paper include the technique that is used to gather GPA information. Jones et al. (2013) indicate that the GPA is captured during the semester of the intermediate course, which for most students would be the first or second semester of attending the four-year school. As cited above, other studies indicate significant transfer shock (during the first semester) exists causing a temporary dip in grades, as students adjust to the social and academic challenges of the new school. Further, they claim that institution doesn't matter, yet they haven't controlled for grade inflation that may exist at the two-year institution. Other studies have controlled for this by using a required prerequisite common to all students at the four-year institution, or as in the case of this research, the use of an accounting diagnostic tool that measures student readiness at the same time, same place and using the same instrument.

Domingo & Nouri (2016) provide empirical data on the academic performance of transfer students in upper division accounting courses over a four-year period. They find that transfer students earn statistically lower grades in Intermediate I, Cost Accounting, and Advanced Accounting courses in comparison to native students. Students are matched based on gender, year of graduation, and grade in a common accounting course taken at the four-year institution. Additionally, if multiple sections of each course were necessary, they were taught by a common instructor in a single year (may change from year-to-year). Although most empirical studies use regression and t-tests, these researchers used MANCOVA (Multivariate Analysis of Covariance) to test the hypothesis on multiple courses (multiple dependent variables). Domingo & Nouri (2016) also document that the highest grade-point difference occurred in the first semester of the transfer students' junior year, which provides additional support for transfer shock theory. Unlike other studies, they find that the transfer students fail to recover GPA in upper-level accounting courses.

There are several studies that suggest various types of interventions to improve student performance, retention and graduation rates. Glass & Harrington (2002) suggest that four-year institutions should provide counseling, tutoring, and mentoring to transfer students to assist them in adjusting to the social and academic life of the school. Townsend (1995) indicates that students find the classroom environment less supportive and less interactive at four-year institutions. Laanan (2001) also reports that transfer students who seek assistance from academic advisors and other support services improve academic success. Pre-transfer intervention is also cited as important in increasing student awareness of the challenges that exist at the new school. The creation of programs developed specifically for transfer students at the new school are also crucial to improving student success, retention and graduation rates (Thurmond, 2007). Huang et al. (2005) study the impact of using a prerequisite course (a one-credit hour course that focuses on the accounting cycle) or passing a pretest before enrolling in intermediate accounting. They suggest using these measures to improve student readiness for upper division coursework. Hoffman & Wallach (2005) suggest the use of a mentoring program in which native students mentored transfer students in transition to the four-year institution. They found that as a result of the mentor program transfer students held higher self-esteem, higher academic performance and motivation.

Based on this review of the literature the following hypothesis will be tested:

H1: Students are prepared for upper division course work by demonstrating competence in prerequisite knowledge.

H2: There's no statistical difference between the scores of native students and transfer students on the prerequisite accounting diagnostic tool.

H3: There's no statistical difference between the scores on the prerequisite accounting diagnostic tool and the amount of time between principles of accounting and upper division course work.

THE ACCOUNTING DIAGNOSTIC TOOL, DATA AND METHODOLOGY

The accounting diagnostics tool includes six questions that assess pre-requisite accounting knowledge for an upper division, financial statement analysis course (see Appendix A). The learning objectives for prerequisite knowledge include: 1) the ability to evaluate the financial statements to judge liquidity, 2) the ability to discern among various accounts and identify the five basic accounting elements, 3) the ability to examine a financial statement category and list common accounts, 4) the ability to identify the main purpose of each of the financial statements, and 5) the ability to explain how the balance in an account was created and then interpreted. These five learning outcomes were identified by the faculty teaching the upper division course as critical prerequisite knowledge. Each question was developed to provide the data necessary for evaluating student readiness.

A total of 113 students took the diagnostic assessment. The sample includes 85 students enrolled at a comprehensive public university college and 28 students from two community colleges. Articulation agreements exist between both community colleges and the comprehensive public university. Only lower division courses are accepted as transfer credits towards major degree requirements. The two community colleges were selected for having provided a large number of transfer students which met the sample size requirements for the study. The data are collected over two semesters: fall of 2016 and fall of 2017. All students enrolled in the upper division financial statement analysis course completed the 6-question accounting diagnostic tool assessment. (Scores are expressed as whole numbers on a scale of 0 to 6.) Each student provided when and where they took principles-level accounting.

The upper division course, Financial Statement Analysis, is open to students who have completed the necessary prerequisites. Prerequisites include Corporate Finance (which has two prerequisites: the second accounting principles course and junior level standing). Given that the financial statement analysis class is a fall-only course offering, most students are seniors or second semester juniors. For some students, the time between the accounting prerequisite and the upper division course is a few months, for others it's a few years. For the financial statement analysis class, selected financial accounting principles are studied in detail and the implications for financial statement analysis are discussed. The purpose of the course is to prepare students to use and interpret economic and accounting information that is essential to financial analysis and valuation.

The methods used to study the data include descriptive statistics, linear regression models and z-tests (for checking robustness in the regression models).

Total AVERAGE SCORES from the diagnostic tool were used as the dependent variable. Independent variables include:

1. TIME LAPSE and DUMMY VARIABLE FOR LOCATION
2. (NATIVE x TIME LAPSE), (TRANSFER-1 x TIME LAPSE), (TRANSFER-2 x TIME LAPSE)

The variable names include the following:

AVERAGE SCORES: accounting diagnostic tool result; out of 6 points

Q1 SCORES: question #1 average scores; out of 1
Q2 SCORES: question #2 average scores; out of 1
Q3 SCORES: question #3 average scores; out of 1
Q4 SCORES: question #4 average scores; out of 1
Q5 SCORES: question #5 average scores; out of 1
Q6 SCORES: question #6 average scores; out of 1

TIME LAPSE: months since completing principles of accounting 2 course
DUMMY VARIABLE FOR NATIVE: four-year comprehensive
DUMMY VARIABLE FOR TRANSFER: community colleges (2 institutions)
DUMMY VARIABLE FOR TRANSFER-1: community college #1
DUMMY VARIABLE FOR TRANSFER-2: community college #2

RESULTS

Tables are contained at the end of this article. Table 1 lists the mean scores on the accounting diagnostic tool. The overall mean is 3.7699 (62.8 percent). Native students outperformed transfer students scoring 3.9294; 65% versus 3.2857; 55%. Although native students outperformed all transfer students and transfer-1 outperformed transfer-2, the overall result indicates that all students failed to demonstrate sufficient proficiency on the assessment. Variance results indicate that there is a larger range of aptitude among transfer students than native students. Some transfer students perform exceptionally well, and others perform poorly. The individual question scores followed similar trends with native students outscoring transfer students on all six questions with increasing variances for transfer student learners. The time lapse variable is an average of 12 months and varies from an average of 10 months for native learners to an average of 24 months for transfer-2 student learners and increases in variability for transfer learners. The difference in the time lapse variable is most likely a result of the timing difference in the principles level course requirements for transfer students (freshmen level courses), whereas native students complete principles level course work during their sophomore year.

The results of the 2 linear regressions are presented in Table 2.

Model 1

This model includes two independent variables: TIME LAPSE (the number of months since taking the principles-level 2 accounting course) and NATIVE (a categorical dummy variable for the institution). The adjusted R-Square value for this model is 0.0533 indicating that the goodness of fit is low. The F-statistic, however, is high at 4.15 (p= 0.0183) indicating that the combined effect of the predictor variables explains some of the variance in scores. The TIME LAPSE variable in model 1 is -0.0142, indicating that student scores decline as the time between prerequisite and upper division course selections increase, but the coefficient is not statistically significant. The NATIVE variable in model 1 is 0.5293, indicating that student scores are higher for native students (out of 6, 9 percent increase) and the p-value = 0.0474. This result is consistent with the literature; native students outperform transfer students.

Model 2

This model includes 3 interactive independent variables: (NATIVE x TIME LAPSE), (TRANSFER-1 x TIME LAPSE), AND (TRANSFER-2 x TIME LAPSE). The adjusted R-Square value for this model is 0.0406 indicating that the goodness of fit is low. The F-statistic, however, is 2.58 (p=0.0572) indicating that the combined effect of the predictor variables explains some of the variance in scores. The coefficients for all three variables are negative indicating that the scores decrease as time lapse increases. For native students, the coefficient of the regression is -0.0103 points (p value = 0.5511). The average time lapse for native students is 10 months. For Transfer-1, the coefficient of the regression is -0.0594 points (p = 0.0317) and the average time lapse is 11 months. For Transfer-2, the coefficient of the regression is -0.0277 (p = 0.0489) and the average time lapse is 24 months. The last two variables (community college students) indicate that scores decrease when the time lapse increases. A "forgetting variable" may be present for these students and further research is needed to determine the tipping-point for this variable. Other possible explanations for the difference between native and transfer students include transfer shock, however, most students enrolled in the class are seniors or second semester juniors where transfer shock impacts are less likely to be evident.

In summary, all students performed poorly on the diagnostic test. Native students performed better than transfer students and the time lapse matters at some point, indicating the potential presence of a "forgetting variable" for learners.

Since this model explains less than 10 percent of the total variance, other factors are likely to affect scores. Age, level of interest, math aptitude, reading aptitude, faculty quality, course descriptions, curricular quality, instructional quality and cultural factors come into play. General results on the test indicate poor retention and performance overall and future research may include additional explanatory variables to improve regression results.

To test regression robustness, z-test scores are calculated. Mean differences for each question/learning objective are analyzed as well as the time lapse variable. Z-test scores are listed in Table 3.

The results of the z-tests confirm the linear regression results: native students outperform transfer students on the accounting diagnostic tool and the results are statistically significant. In addition, transfer students document a longer lag between taking the principles level course and the upper division course. This provides a measure of robustness to the results of the regression models. An examination of the data related to each individual learning objective provides detail on where students may struggle and the need for necessary interventions.

For learning objective #1 (question 1), the ability to evaluate the financial statements to judge liquidity, the average score was 39% (42% for native and 29% for transfer students, p = .0890). Both groups failed to demonstrate adequate proficiency in this area and the difference between the populations was significant at the 10% level.

For learning objective #2, (question 2), the ability to discern among various accounts and identify the five basic accounting elements, the average score was 93% (94% for native and 89% for transfer students, p =0.2280). Both groups demonstrated exceptional proficiency in this area and the difference was not statistically significant.

For learning objective #3, (question 3 and 4) the ability to examine a financial statement category and list common accounts, the average score for question 3 was 14% (15% for native and 11% for transfer students, p =0.2604) indicating that both groups failed to demonstrate proficiency in this area. The question answer (c) includes a reference to comprehensive income and most principles-level courses do not cover this concept. Further, many students who errored on this question selected this answer. The average score for 4 was 73% (74% for native and 68% for transfer students, p = 0.2693) indicating that both groups demonstrated adequate proficiency in this area.

For learning objective #4 (question 5), the ability to identify the main purpose of each of the financial statements, the average score was 78% (82% for native and 64% for transfer students, p = .0371) indicating that native learners demonstrated adequate proficiency, but transfer students did not.

For learning objective #5 (question 6), the ability to explain how the balance in an account was created and then interpreted, the average score was 81% (85% for native and 68% for transfer, p = 0.0429) indicating that native learners demonstrated adequate proficiency, but transfer student results were marginal.

The mean for the TIME LAPSE variable is 10 months for native learners, 11 months for Transfer-1 and 24 months for Transfer-2. The average for native and transfer-1 combined was 10.1531 months, whereas the mean for transfer-2 students was much higher (24 months).

H1: Students are prepared for upper division course work by demonstrating competence in prerequisite knowledge, is rejected. The results indicate that on average students taking the assessment failed to demonstrate sufficient proficiency. There were a few learning objectives (2 and 5) where the average score was sufficient, and further research is needed to more clearly identify the areas in which students need additional support.

H2: There's no statistical difference between the scores of native students and transfer students on the prerequisite accounting diagnostic tool, is rejected. The results indicate that on average native students outperformed transfer students.

H3: There's no statistical difference between the scores on the prerequisite accounting diagnostic tool and the amount of time between principles of accounting and upper division course work, is partially rejected. For native students, the time lapse was not significant, but for both transfer groups, the time lapse had a negative impact on student scores.

CONCLUSIONS

Results from this paper suggest that students on average fail to demonstrate adequate prerequisite knowledge on an accounting diagnostic tool. Faculty may find it beneficial to review and reinforce required prerequisite knowledge at the beginning of the course. Although faculty may reject this idea due to concerns over the ability to cover the desired topics, improving student skills at the foundation-level may provide a deeper understanding of the material and higher-order skill development (Dreyfus and Dreyfus, 2005), and student results may improve overall (Sargent, 2013). Suggested remedies include the use of proficiency tests and tutoring (Sargent, 2013) and accounting cycle practice sets (Jones and Roberts, 2005). These tools are examples of activities that can be utilized as a recourse for closing the loop on student assessment data in meeting general program goals and objectives. Additional research and methods for identifying and developing prerequisite knowledge and its impact on overall student performance is needed.

Results from this study provide useful information to faculty for identifying key learning objectives for prerequisite knowledge. This identification of key learning objectives is critical for faculty and for students. When faculty communicate effectively with each other about valid data on student achievement of course learning objectives, opportunities to strengthen prerequisite skills emerge. For students, identifying key learning objectives and obtaining individualized data (feedback) about performance will potentially rectify knowledge gaps, and improve readiness for upper division course work. This type of information will be valuable to them as upper classmen, preparing for certification exams and their careers.

Finally, the time lapse between taking the prerequisite course and the upper division course is relevant. The results indicate that at some point, the period between the required prerequisites and the upper division course negatively impact the scores (more research is needed to determine a tipping-point). The results may provide a strong rationale for advising transfer students with significant time lapse and questionable prerequisite scores to consider revisiting the topics or repeating the principles level course work prior to taking upper division courses. It may even provide justification for not accepting transfer credits for certain core classes if too much time has expired.

AACSB International (2008) recommends that research has a measurable impact. This paper suggests a method for identifying student weaknesses. Additionally, the results of this study provide the basis for meaningful faculty discourse on strengthening instructional effectiveness through the use of well-constructed learning objectives and valid assessment data. The quality of faculty conversations improves with the use of empirical data that supports effective decision making to create a measurable impact on students.

Although these statistical results align with other studies in the literature, care should be exercised in generalizing the results for decision making related to transfer issues at other four-year institutions. This study was based on local data and may only be applicable to those institutions involved in the study. The instruments, learning objectives and statistical techniques are transferrable tools for faculty seeking to evaluate student performance data.

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TABLES

Table 1: Descriptive Data

	TOTAL	NATIVE	TRANSFER	TRANSFER-1	TRANSFER-2
N	113	85	28	13	15
SCORES	Mean = 3.7699 Var = 1.3573 Min 1; Max 6	Mean = 3.9294 Var = 1.2667 Min 2; Max 6	Mean = 3.2857 Var = 1.4709 Min 1; Max 5	Mean = 3.4615 Var = 1.7692 Min 2; Max 5	Mean = 3.1333 Var = 1.2667 Min 2; Max 5
Q1 SCORES	Mean = 0.3894 Var = 0.2399 Min 0; Max 1	Mean = 0.4235 Var = 0.2471 Min 0; Max 1	Mean = 0.2857 Var = 0.2116 Min 0; Max 1	Mean = 0.3077 Var = 0.2308 Min 0; Max 1	Mean = 0.2667 Var = 0.2095 Min 0; Max 1
Q2 SCORES	Mean = 0.9292 Var = 0.0664 Min 0; Max 1	Mean = 0.9412 Var = 0.0560 Min 0; Max 1	Mean = 0.8929 Var = 0.0992 Min 0; Max 1	Mean = 0.9231 Var = 0.0769 Min 0; Max 1	Mean = 0.8667 Var = 0.1238 Min 0; Max 1
Q3 SCORES	Mean = 0.1416 Var =0.1226 Min 0; Max 1	Mean = 0.1529 Var = 0.1311 Min 0; Max 1	Mean = 0.1071 Var = 0.0992 Min 0; Max 1	Mean = 0.1538 Var = 0.1410 Min 0; Max 1	Mean = 0.0667 Var = 0.0667 Min 0; Max 1
Q4 SCORES	Mean = 0.7257 Var = 0.2009 Min 0; Max 1	Mean = 0.7412 Var = 0.1941 Min 0; Max 1	Mean = 0.6786 Var = 0.2262 Min 0; Max 1	Mean = 0.6923 Var = 0.2308 Min 0; Max 1	Mean = 0.6667 Var = 0.2381 Min 0; Max 1
Q5 SCORES	Mean = 0.7787 Var = 0.1738 Min 0; Max 1	Mean = 0.8235 Var = 0.1471 Min 0; Max 1	Mean = 0.6429 Var = 0.2381 Min 0; Max 1	Mean = 0.7692 Var = 0.1923 Min 0; Max 1	Mean = 0.5333 Var = 0.2667 Min 0; Max 1
Q6 SCORES	Mean = 0.80531 Var = 0.1582 Min 0; Max 1	Mean = 0.8471 Var = 0.1311 Min 0; Max 1	Mean = 0.6786 Var = 0.2262 Min 0; Max 1	Mean = 0.6154 Var = 0.2564 Min 0; Max 1	Mean = 0.7333 Var = 0.2095 Min 0; Max 1
TIME LAPSE	Mean = 12.0442 Var = 98.1320 Min 1; Max 76	Mean = 10.0471 Var = 42.3073 Min 1; Max 28	Mean = 18.1071 Var = 224.77 Min 1; Max 76	Mean = 10.85 Var = 56.81 Min 1; max 30	Mean = 24.4 Var = 293.4 Min 9; max 76

Table 2: Regression Results

	Model 1		Model 2	
	Coef.	p-value	Coef.	p-value
Constant	3.5427	0.000	3.8063	0.000
Time Lapse	-0.0142	0.2220		
Native	0.5293	0.0474		
Native x Time Lapse			-0.0103	0.5511
Transfer-1 x Time Lapse			-0.0594	0.0317
Transfer-2 x Time Lapse			-0.0277	0.0489

Table 3: Z-test Scores

Z-tests N > 25 Comparing Mean Scores			
Comparison of Scores	Mean 1 Native Students (6 pts)	Mean 2 Community College Students	P-value (One-tailed)
Native mean vs. community college mean	3.9294 points (65% average)	3.2857 points (55% average)	0.0065
Q1 native vs. community college mean (39% overall average)	0.4235 points (42.35% average)	0.2857 points (28.57% average)	0.0890
Q2 native vs. community college mean (93% overall average)	0.94112 points (94.112% average)	0.8929 points (89.29% average)	0.2280
Q3 native vs. community college mean (14% overall average)	0.1529 points (15.29% average)	0.1071 points (10.71% average)	0.2604
Q4 native vs. community college mean (73% overall average)	0.7412 points (74.12% average)	0.6786 points (67.86% average)	0.2693
Q5 native vs. community college mean (78% overall average)	0.8235 points (82.35% average)	0.6429 points (64.29% average)	0.0371
Q6 native vs. community college mean (81% overall average)	0.8471 points (84.71% average)	0.6786 points (67.86% average)	0.0429
(Native + Transfer 1) vs. Transfer 2 Time Lapse	10.1531 months	24.4000 months	0.0000

APPENDIX A
Accounting Diagnostic Tool

At which institution did you take Accounting: ___________________________________

Name the most recent semester in which you studied Accounting: __________________

Learning Objective 1: Evaluate the financial statements to judge liquidity

1. Which financial statement would you look at to determine whether a company will be able to pay for the goods when payment is due in 30 days?
   a) Statement of cash flows.
   b) Statement of stockholders' equity.
   c) Income statement.
   d) Balance sheet.

Learning Objective 2: Discern among various accounts and identify the five basic accounting elements.

2. Which of the following is not considered to be a liability?
   a) Wages payable.
   b) Accounts payable.
   c) Notes payable.
   d) Cost of goods sold.

Learning Objective 3: Examine a financial statement category and list common accounts

3. Assets for a particular business might include

   a) Cash, retained earnings, and accounts payable.
   b) Cash, common shareholders' equity, and accounts receivable.
   c) Cash, property, plant, and equipment, and accumulated other comprehensive income.
   d) Cash, inventories, and goodwill.

4. The two categories of shareholders; equity usually found on the balance sheet of a corporation are
   a) Contributed capital and property, plant, and equipment.
   b) Retained earnings and notes payable.
   c) Common stock and retained earnings.
   d) Contributed capital and equity securities.