The Nuances of Tutoring and Academic Performance of Undergraduate Students

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Abstract

The purpose of this study was to investigate the relationship between the length of a weekly tutoring session and student GPA for the first two semesters of college. The study was conducted at a private, midsize university in the Midwest. The sample consisted of 124 students admitted with academic stipulations to the university, meaning that students needed to participate in a mandatory once -a-week tutoring session during their first semester at the university. Results indicated that the reduction in length of the tutoring sessions from 60 to 30 minutes had no effect on the college GPA of entering high school students (traditional freshman) in their first or second semester of college. Entering transfer students who received 60 minutes of tutoring had significantly higher GPAs in their first semester at the study university (in which tutoring occurred) than did their counterparts who received 30 minutes of tutoring. No difference in GPAs existed between these transfer populations in the second semester of study (in which tutoring did not occur). The majority of students in both the 60 minute and 30 minute tutoring groups were retained over the two semesters of the study. The need for future research on specific tutoring models and programs is discussed.

Keywords: tutoring, higher education, retention, at-risk populations

Introduction

Research on the effectiveness of tutoring programs at colleges and universities is often linked to retention efforts in higher education. Making a connection with a peer or professional tutor can help students gain proficiency in specific academic content areas, as well as help students gain soft skills such as general time management and study strategies, learning how to ask for help, etc. (Sanchez, Bauer, & Poronto, 2006). Tutoring can also promote a relationship between tutor and student that has been cited as a factor in student retention in higher education (Maggio, 2006). This type of comprehensive tutoring may be particularly helpful for underprepared students who are at-risk of dropping out of college or of being academically dismissed (Reinheimer & McKenzie, 2011).

George, Dixon, Stansal, Lund-Gelb, and Pheri (2008) noted that variables such as time management skills and goal establishment (i.e., soft skills) are better predictors of personal and general life accomplishments than is academic performance. George et al. also reported that when analyzing multiple variables of success factors in higher education, time-management skills were the singularly most significant predictor of GPA. However, the relationship between tutoring and academic success, relationship building, and student retention must be further analyzed.

Literature Review

A review of the literature on the effectiveness of tutoring in higher education reveals inconclusive results, with the most successful tutoring programs seeming to be those that target specific skills and content-specific requirements (e.g., clinical skills in nursing programs) (see Secomb, 2008). However, the broad array of characteristics and parameters of tutoring programs and their effect on student success need to be delineated.

Facets of tutoring such as peer versus professional, mandatory versus voluntary, and computer versus human tutoring have received some research attention, but more systematic studies are needed in order to identify the qualities and characteristics of effective and efficient tutoring programs. For example, in investigating voluntary tutoring, Maggio (2005) reported that a pre-college voluntary tutoring program utilizing both peer and professional tutors did not positively influence student retention after enrollment in college. Santee and Gakavalia (2006) in conducting a meta-analysis of peer tutoring in pharmaceutical education found that peer tutors had a positive affect on overall academic performance of health care students in pharmacy programs. However, Santee and Gakavalia recognized the need for more rigorously-designed peer tutoring studies both within health care training programs and with other student populations. Similarly, a meta-analytic review of peer tutoring programs in K-12 education, although establishing the success of peer tutoring in specific academic disciplines (i.e., reading, math, English), cited the need for more stringent methodology and statistical reporting in tutoring research (Bowman-Perrott et al., 2013).

Another area worthy of investigation is the delivery of tutoring. For instance, is computer tutoring an effective alternative to in-person, human tutoring? In a review of this literature VanLehn (2011) noted that an advantage of one-on-one synchronous in-person tutoring is that the tutor can infer and assess students' skills as tutoring sessions

progress, and can make recommendations and adjustments accordingly. Such immediate feedback to the student not only promotes the acquisition of learning, but can enhance the student's metacognitive skills and insights in a way that computer tutoring cannot. However, this researcher once again noted the need for additional studies that directly compare human tutoring to various forms of computer tutoring (VanLehn).

Overall, in conducting a general examination of tutoring literature in higher education it seems clear that although a fair amount of research on specific tutoring programs exists, more research on the process and outcome effectiveness of tutoring programs in general is needed. An outline of the current study is presented.

Purpose of the Study

The purpose of this study was to examine the relationship between weekly tutorial sessions (of either 60 minutes or 30 minutes in length) provided to undergraduate students by adult professional tutors, and the GPA of these students over two semesters of enrollment at a midsize Midwestern university. Student retention over the first two semesters of enrollment at the study university was also analyzed and will be discussed in detail in subsequent sections. Students involved in the study were admitted with academic stipulations to the study university because of either an ACT composite score of less than a 20, an entering high school or transfer GPA of a 2.0 - 2.3, or a score below the 50th percentile on the college placement test (Asset test; American College Testing Program, 2006). Students who were in any of the above ACT/GPA categories or combination of categories were required to participate in tutoring and to take developmental coursework as needed. Students entering the school during the 2012-2013 academic year received 60 minutes of professional tutoring each week. Students entering the school during the 2013-2014 academic year received 30 minutes of professional tutoring each week. The decision to reduce the length of tutoring time was based on an increase in the enrollment of students requiring tutoring services, and the reduction of professional staff who provided tutoring services in the academic support area.

Research Questions

This study is a comparison of the effect of 60 minutes versus 30 minutes of weekly professional tutoring on the GPA of undergraduate students both in the semester that tutoring occurred and the semester immediately following tutoring. Student retention over these two semesters is reviewed.

RQ1. What is the relationship between the amount of weekly tutoring time (in the first semester of study) and the first semester GPA of college students admitted with academic stipulations to a Midwestern university?

RQ2. What is the relationship between the amount of weekly tutoring time (in the first semester of study) and the second semester GPA of college students admitted with academic stipulations to a Midwestern university?

RQ3. What is the relationship between the amount of weekly tutoring time (in the first semester of study) and the retention rate of students admitted with academic stipulations to a Midwestern university at the completion of their second semester at the study?

Methods

The sample population included all students admitted to the study university under academic stipulations from fall 2012 through fall of 2013. These stipulations mandated participation in a one semester tutoring program, and in some instances required developmental course work during this same semester. The dependent variable in this study was the first and second semester GPA of these undergraduate students; the independent variable was the length of a once-a-week tutoring session. Since this was the only variable that was empirically investigated in relationship to GPA (academic performance), other possible confounding variables to academic performance will be discussed in the *Limitations* section.

The students in the sample were identified as academically "at-risk" based upon a sliding scale of ACT composite score and high school and/or college GPA. Since an ACT composite score of a 20 is the admission standard for incoming students at the study university, any entering high school student (traditional freshman) scoring below a 20 on the ACT is considered at-risk. The operational definition of being "at-risk" in this study means being academically underprepared for college level work and being at greater risk of academic dismissal. Students are also considered at-risk if they score below the 50th percentile on the Asset placement test (Asset test; American College Testing Program, 2006). Freshman entering the university with a composite ACT score of 18 or 19, a high school cumulative GPA of 2.3 or above, and/or an Asset test score below the 50th percentile in reading, writing, or numerical skills are required to attend a tutoring session once a week with a professional tutor and to take appropriate developmental coursework. Transfer students who score below the 50th percentile on the Asset test and/or who have a college transfer GPA of 2.3 or less are also required to participate in tutoring and to take developmental coursework.

The professional tutors in this study were staff and/or faculty who have subject area expertise and training in academic support skills and study strategies. One-on-one tutoring sessions occurred in the academic support center. The focus of the tutoring sessions was chiefly to help students with discipline-specific content matter (e.g. history, psychology, algebra). Tutoring included teaching study strategies, helping with grammatical construction of written assignments, reviewing math formulas, etc. Some work on time management skills and other soft skills such as prioritizing work and helping students feel comfortable asking professors' for help was addressed, but this was not the main focus of the sessions, nor did it occur consistently. This was often due to the time constraints of the tutoring sessions. Since tutors and students only met once a week for either 60 or 30 minutes, most of the time was spent helping students with specific assignments or upcoming tests, rather than with more peripheral success strategies.

Data were collected over four consecutive semesters and included gender, race (people of color/white), applicant classification (incoming high school student/transfer student), Asset test scores (numerical skills, writing, reading, and cumulative) (Asset test;

American College Testing Program, 2006), length of weekly tutorial session (60 minutes/30 minutes), first semester GPA, and second semester GPA. Data were extracted directly from the study university database, Jenzebar, and uploaded into an Excel spreadsheet. In some instances, data were re-coded by the researchers in order to facilitate analysis.

Data were analyzed with SPSS version 22. Descriptive statistics included means and standard deviations. Levene's Test for Equality of Variance as well as one and two-tailed t-tests were run. Additionally, applicant classification (incoming high school student/transfer student) was analyzed as a subset.

The intervention in this historical quasi-experimental study was the length of the weekly tutoring session. Although the amount of weekly tutorial time varied from 60 to 30 minutes, the other elements of tutoring remained consistent.

Data Collection and Instruments

General. Data were obtained directly from the study university computer system. The university gathered and maintained information as follows: demographic information, including gender and race, were self-reported on the student application. Applicant classification was verified through official transcripts submitted directly to the study university. First and second semester GPA were recorded by the Office of the Registrar. The Asset test was proctored in a paper and pencil format by academic support personnel to all entering students before the start of their first semester of study. Scores were recorded in the Jenzebar database system.

Asset Test. The Asset test is produced by American College Testing Program (ACT, 2006) and is an instrument often used as a precollege placement test to identify student skill levels in the areas of writing, reading, and numerical skills. Scores on the Asset test are used at the study university as a counseling and advising tool with students to ensure that students are placed in courses commensurate with their academic skills. There is no passing score on the Asset test; rather, scores provide a comparative percentile ranking of students' demonstrated abilities in the three content areas. The threshold cumulative score qualifying the student for academic stipulation varied depending upon ACT score and incoming GPA.

Results

Demographics

The sample population consisted of 124 undergraduate students admitted with academic stipulations to a midsize Midwestern university from fall 2012 through fall of 2013. Students admitted in the fall of 2012 and the spring of 2013 (n=57) received 60 minutes of weekly support. Students admitted in the fall of 2013 (n=67) received 30 minutes of support. Entering high school students (traditional freshman) (n=75) and transfer students (n=49) were grouped for separate analysis. See Table 1.

Table 1: Demographic Information for Students in Tutoring Program

N=124

60 Minutes of Tutoring	Entering High School Students (Traditional Freshman)	Transfer Students	Total
Race/Ethnicity: People of Color	22	24	46
White	16	5	21
Gender: Female	22	14	36
Male	16	15	31

30 Minutes of Tutoring	Entering High School Students (Traditional Freshman)	Transfer Students	Total
Race/Ethnicity: People of Color	23	14	37
White	14	6	20
Gender: Female	20	10	30
Male	17	10	27

Because the purpose of this study was chiefly to investigate the relationship between academic performance (GPA) and length of tutoring sessions, the variables of race and gender were not analyzed. These demographic variables are reported solely to provide a descriptive profile of the sample. Note that demographics of the incoming high school students (traditional freshman) and transfer students are delineated. These two groups will become important populations as the statistical analysis narrows to more closely scrutinize these homogeneous sub-populations. Because academic support can be modified based upon the profile of incoming high school students or transfer students, an understanding of the performance of these populations is particularly relevant in assessing the effect of 60 minute versus 30 minute tutorial sessions.

Nonetheless, because this study utilizes independent sample groups and identifies the dependent variables as GPA, it is important to examine demographics as related to the incoming academic skills of the sample groups. It is important to confirm that there is no statistically significant difference in initial academic skills of the selected sample, a difference that might affect the study results. This independent sample population

comparison as well as the results of the statistical analysis of the research questions and related hypotheses follow.

Findings

RQ1. What is the relationship between the amount of weekly tutoring time (in the first semester of study) and the first semester GPA of college students admitted with academic stipulations to a Midwestern university?

Null Hypothesis 1A.

H_{01A}:

Students who received 60 minutes of weekly professional tutoring earned the same GPA the first semester that tutoring occurred as the students who received 30 minutes of weekly professional tutoring, p<.05.

Comparability of the independent samples must be established in order to conduct a viable study. This is particularly so with the incoming academic skill set of the sample population. The profile as assessed by the Asset and analyzed by a two-tailed t-test indicated that there was no statistically significant difference between the incoming Asset scores (numerical skills, writing, reading, and cumulative) of the independent samples outlined in H_{01A} where p<.05. Note that Levene's Test for Equality of the Variances indicated that equal variance can be assumed (Sig. range=.183 to .646). For means and standard deviations of the independent sample populations, see Table 2. Asset Numerical Skills: $t(122) = -.439$, p=.661; Asset Writing: $t(122) = -1.478$, p=.142; Asset Reading: $t(122) = .739$, p=.461; Asset Cumulative Score: $t(122) = -.533$, p=.603. Therefore, in this regard, the independent sample populations can be considered similar; the results of the analysis of the hypothesis can be attributed to something other than a difference in incoming academic skills of the students.

The appropriateness of the use of a t-test for the analysis of H_{01A} was confirmed through Levene's Test for Equality of the Variances which indicated that equal variance could be assumed (Sig.=.358). The two-tailed t-test revealed that there was no statistically significant difference between the first semester GPA of students who received 60 minutes weekly of professional tutoring and the students who received 30 minutes weekly of professional tutoring. $t(122) = .518$, p=.605. The null hypothesis could not be rejected.

Null Hypothesis 1B. Recall that this research grouped incoming high school students (traditional freshman) and transfer students for separate analysis. The null hypothesis as related to incoming high school students and first semester GPA is as follows:

H_{01B}:

Incoming high school students who received 60 minutes weekly of professional tutoring earned the same GPA the first semester that tutoring occurred as the incoming high school students who received 30 minutes weekly of professional tutoring, p<.05.

It is important that the independent samples possess similar profiles especially as related to incoming academic skills. Levene's Test for Equality of Variances indicated

that equal variances could be assumed for Asset writing, reading, and cumulative scores, p<.05 (Sig. range .176 to .664). However, equal variances could not be assumed for the Numerical Skills scores (Sig.=.001). In this case, the independent two-tailed t-test calculation was adjusted accordingly utilizing SPSS. Calculations on all Asset scores revealed that incoming academic skills profile was not statistically significantly different between independent samples. Thus, the results of the statistical analysis of the H_{01B} are not likely to have been effected by the incoming skill set. For means and standard deviations of the independent sample populations, see Table 2. Asset Numerical Skills: t(73) =.207, p=.836; Asset Writing: t(73) = -1.687, p=.096; Asset Reading: t(73) = .358, p=.721; Asset Cumulative Score: t(73) =-.438, p=.663.

Therefore, given a lack of statistically significant difference, it is appropriate to proceed with an analysis of the hypothesis. Levene's Test reveals that variance cannot be assumed (Sig.=.009) for H_{01B}. Again, the t-test was adjusted accordingly: t(73) = -1.161, p=.251. See Table 2 for the means and standard deviations of the independent samples. The analysis of H_{01B} revealed no statistically significant difference between the first semester GPA of incoming high school students (traditional freshman)who received 60 minutes weekly of professional tutoring and the incoming high school students   who received 30 minutes weekly of professional tutoring.

Null Hypothesis 1C:
H_{01C}
Transfer students who received 60 minutes weekly of professional tutoring earned the same GPA the first semester that tutoring occurred as the transfer students who received 30 minutes weekly of professional tutoring, p<.05.
A review of the independent sample Asset score as revealed through Levene's Test for Equality of Variances indicated that equal variance could be assumed for all Asset scores except Numerical Skills (Sig.=.037). The SPSS t-test calculation for Numerical Skills was adjusted accordingly. The two-tailed t-test indicated no statistically significant difference between any of the Asset scores for the independent sample populations. See Table 2 for the means and standard deviations of the independent samples. Asset Numerical Skills: t(47) = -1.031, p=.308; Asset Writing: t(47) = -.874, p=.387; Asset Reading: t(47) = .656, p=.515; Asset Cumulative Score: t(47) = -.505, p=.616.

Levene's Test indicated that equal variance can be assumed for transfer student first semester GPA (Sig.=.218). However, the two-tailed t-test indicated a statistically significant difference between the GPA of transfer students who received 60 minutes weekly of professional tutoring and those who received 30 minutes weekly of professional tutoring. t(47)=2.034, p=.026. See Table 2 for the means and standard deviations of the independent samples. Because the two-tailed t-test does not indicate directionality a one-tailed t-test was performed. In this case the null hypothesis was *Transfer students who received 60 minutes weekly of professional tutoring earned a lower GPA the first semester that tutoring occurred than the transfer students who received 30 minutes weekly of professional tutoring, p<.05.* The critical value was 1.678, therefore the null hypothesis was rejected. Transfer students receiving 60 minutes of weekly professional tutoring earned a higher GPA than their 30 minute counterparts. Cohen's d, an estimate of effect size, indicates a medium effect (d =.687). See Table 2.

Table 2: Descriptive Statistics of First Semester GPA (in which tutoring occurred)

	Minutes of Weekly Tutoring	n	Mean	Standard Deviation
Total Sample Population	60 Minutes	57	2.720	1.027
	30 Minutes	67	2.633	.829
High School Students	60 Minutes	37	2.600	1.144
	30 Minutes	38	2.849	.639
Transfer Students	60 Minutes	20	2.941	.741
	30 Minutes	29	2.350	.966

RQ1 Summary

In summary, an independent sample two-tailed t-test revealed no statistical difference between GPA attained at the end of the first semester in which tutoring occurred for students receiving 60 minutes of tutoring a week compared to those receiving 30 minutes of tutoring a week. This was true for the entering high school student population. However, transfer students who received 60 minutes of weekly tutoring earned a statistically significant higher GPA than those transfer students who received 30 minutes weekly of tutoring in the semester that tutoring occurred.

RQ2. What is the relationship between the amount of weekly tutoring time (in the first semester of study) and the second semester GPA of college students admitted with academic stipulations to a Midwestern university?
Three distinct hypothesis related to this research question were analyzed. The previous section entitled RQ1established that the independent samples utilized in these hypotheses were not statistically significantly different with regard to incoming academic skills as assessed by the Asset. Given this foundation, independent two-tailed t-tests were calculated for each of the following null hypotheses related to RQ2.

H_{02A}:
Students who received 60 minutes of weekly professional tutoring earned the same GPA the semester immediately following tutoring as the students who received 30 minutes of weekly professional tutoring, p<.05.
Equal variance was assumed (Levene's Test for Equality of Variances Sig. =.549). t(107) = .942, p=.349. As a result, there was a failure to reject the null hypothesis. The GPA for both sample populations was not significantly different.

H_{02B}:
Incoming high school students (traditional freshman) who received 60 minutes of weekly professional tutoring earned the same GPA the semester immediately following tutoring as incoming high school students who received 30 minutes of weekly professional tutoring, p<.05.

Levene's Test for Equality of Variances allows for the assumption of equal variance (Sig. =.373). An independent two-tailed t-test was run. $t(65) = 1.393$, $p=.168$. Result necessitated a failure to reject the null hypothesis. Therefore, the GPA for the semester immediately following tutoring was not statistically significantly different for the incoming high school students receiving 60 minutes of weekly tutoring and incoming high school students receiving 30 minutes of weekly tutoring.

H_{02C}:
Transfer students who received 60 minutes of weekly professional tutoring earned the same GPA the semester immediately following tutoring as transfer students who received 30 minutes of weekly professional tutoring, p<.05.

Levene's Test for Equality of Variances allows for the assumption of equal variance (Sig. =.951). An independent two-tailed t-test was run. $t(40) = .171$, $p=.865$. As a result, there was a failure to reject the null hypothesis. The GPA for the semester immediately following tutoring is not statistically significantly different for transfer students receiving 60 minutes of weekly tutoring and transfer students receiving 30 minutes of weekly tutoring. See Table 3.

Table 3: Descriptive Statistics of Second Semester GPA (after tutoring occurred)

	Minutes of Weekly Tutoring	n	Mean	Standard Deviation
Total Sample Population	60 Minutes	49	2.773	1.017
	30 Minutes	60	2.580	1.100
High School Students	60 Minutes	32	2.951	.830
	30 Minutes	35	2.634	1.013
Transfer Students	60 Minutes	17	2.437	1.258
	30 Minutes	25	2.504	1.230

RQ2 Summary
A one tailed independent sample t-test revealed no statistical difference in GPA between students receiving 60 minutes of tutoring a week compared to those receiving 30 minutes of tutoring at the end of the second semester in which tutoring did not occur.

This was true for both the entering high school student population as well as for the transfer student population.

RQ3. What is the relationship between the amount of weekly tutoring time (in the first semester of study) and the retention rate of students admitted with academic stipulations to a Midwestern university at the completion of their second semester at the study?
As previously noted, the sample population consisted of 124 undergraduate students entering a midsize Midwestern university under academic stipulations from fall 2012 through fall of 2013. Of these 124 students, 15 students withdrew or earned a GPA of 0.00 (indicating academic dismissal)during the first or second semester of enrollment at the university. Of these students, 8 received 60 minutes of weekly tutoring, and 7 received 30 minutes of weekly tutoring. The number of students in the sample population who withdrew or who received a 0.00 GPA was too small for a comparison between independent samples. However, insight may be gleaned from a cursory review of the raw data. See Table 4.

Table 4: Retention of Students in Tutoring Program

Amount of Tutoring	Percent Retained at End of First Semester	Percent Retained Over Two Semesters
60 Minutes n=67	99%	85%
30 Minutes n=57	93%	84%

RQ3 Summary
Although an analysis of student retention among the students admitted to the study university with academic stipulations appears to be a natural extension of the research questions in this study, statistical analysis of retention proved unjustified due to the small number of students in this study who withdrew or who received a 0.00 GPA (indicating academic dismissal) after the first year of attendance. Still, some important information can be assembled through a basic analysis of retention percentages of the entire sample population.

Discussion

The results of this study indicate that entering high school students (traditional freshman) at the study university who were required to participate in mandatory tutoring and who received 60 minutes of professional tutoring a week performed as well academically, as measured by GPA at the end of their first semester (in which tutoring occurred) and at the end of their second semester (in which tutoring did not occur), as students who received 30 minutes of tutoring a week. However, entering transfer students who received 60 minutes of tutoring had significantly higher GPAs in their first semester at the study university (in which tutoring occurred) than did their counterparts who received 30 minutes of tutoring. No difference in GPAs existed between the transfer populations in the second semester of study (after tutoring had occurred). Also, there was no difference in retention rates between these two populations at the end of the first semester or over the first two semesters combined. This was true for both entering high school students and transfer students. Due to the small number of students in the study who left the university after the first or second semester, further quantitative analysis of retention did not seem warranted. The decision to reduce the length of tutoring time per week was based on an increased need for tutoring among admitted students, and a reduction of personnel in the academic support area at the study university.

Further research is needed to investigate whether 30 minutes of tutoring a week is indeed as effective as 60 minutes of tutoring, or if *neither* 30 nor 60 minutes of tutoring a week is an adequate amount of time for students identified as being at-risk. Although the high retention rates for this population after two semesters of college would seem to provide tentative evidence that the latter is not the case, it will be necessary to follow these students as they progress into higher level courses in order to draw more definitive conclusions. Recall also that the tutoring program under investigation focused mainly on academic subject-area tutoring and study strategies. Although this type of tutoring may help jumpstart students into the initial four-year college experience, tutoring that encompasses the teaching and modeling of broad soft skills may become more important for students as they move from freshman to senior year and as the demands of college life and academic rigor increase.

Also worthy of consideration is the finding that entering transfer students who received a full hour of tutoring a week earned significantly higher GPAs in the semester that tutoring occurred than their transfer counterparts who received half an hour of tutoring a week. Clearly this population of students benefited from the longer weekly tutoring session. The reasons for this result could be varied, but possibilities may include the following. Transfer students who were already familiar with the demands of college level work may have maximized their tutoring sessions by taking full advantage of the tutor's areas of expertise. Also, the transfer population as a whole may possess more meta-cognitive insights than their first-time college peers because of their greater familiarity with college level work and their knowledge of the skill sets necessary to be successful at this level. Such insights may allow transfer students to more quickly hone in on previously identified academic weaknesses and to use their tutoring time more effectively. However, even with more experienced students it's possible that 30 minutes of tutoring a week was simply not enough time to produce the maximum benefits of tutoring. This finding calls for more research on the delivery and customization of

tutoring programs to specific populations of student learners, including populations identified as being at-risk. One size and type of tutoring may not fit all students.

Limitations

Although this study focused on the relationship between tutoring and the GPA of students identified as at-risk, other variables may have intervened in this relationship. For example, different types of academic support (i.e., help from peers or faculty members), individual student course load, work or family obligations, access to technology, may all have contributed to students' academic performance.

To thoroughly investigate retention at the study university, future studies should compare the retention rate of the at-risk population to the retention rate of the general population of students at the university. Annual retention rates for both populations should be monitored consecutively.

In the current study, retention information on students in the tutoring program was obtained in the following manner. Students who were academically dismissed from the study university were listed as having a 0.00 GPA in the semester of dismissal. This information was used to ascertain retention rates of students in the tutoring program. However, students were able to appeal dismissal decisions at the study university and in some instances may have been reinstated in the semester following dismissal. Appeal status was not recorded on the database used in this study and therefore the number of students who were academically dismissed was estimated.

Lastly, care must be taken in generalizing study results to other colleges and universities and to other student populations. Academic support service personnel at the study university have historically promoted a close, hands-on student-mentor relationship that may have contributed to the general academic success and retention of students in this tutoring program.

Recommendations and Suggestions for Future Research

With the current budgetary cuts and widespread retention issues in higher education, the effect of tutoring and tutoring programs on students' academic skills, general knowledge base, soft skills, and college retention are important questions to consider (see Santee & Gakavalia, 2006). As many institutions move from professional to peer tutors and a reduction in one-on-one tutoring services, the quality and effectiveness of these services needs to be scrutinized to determine which types and formats of tutoring programs are the most beneficial for students entering college without the skills necessary for college level work.

These questions and considerations are particularly important given the contemporary state of academia. At a time when many colleges and universities are reducing their academic support to students and downsizing academic support areas, it appears that more students are entering the doors of higher education underprepared for the rigor of college level work. Moreover, Peck, Chivers, and Lincoln (2010) noted that students want academic support from academic tutors who have expertise in specific content areas. And, Maggio (2005) reported that tutoring by a subject area expert was the most effective academic assistance for students.

Colleges and universities have an obligation to admitted students to provide support services necessary for successful advancement through the undergraduate experience. Solving this service delivery problem in higher education may call for extensive collaboration between academic support personnel, faculty, and researchers in order to devise and investigate "smart" tutoring programs and strategies that serve the needs of 21st century learners.

References

American College Testing Program (2006). *Asset Test.* Iowa City, IA: ACT.

Alpay, E., Cutler, P.S., Eisenbach, S., & Field, A.J. (2010). Changing the marks-based culture of learning through peer-assisted tutorials. *European Journal of Engineering Education, 35*(1), 17-32.

Bowman-Perott, L., Davis, H., Vannest, K.,Williams, L., Greenwood, C., & Parker, R. (2013). Academic benefits of peer tutoring: A meta-analytic review of single-case research. *School Psychology Review, 42*(1), 39-55.

George, D., Dixon, S., Stansal, E., Lund Gelb, S., & Pheri, T. (2008). Time diary and questionnaire of factors associated with academic and personal success among university undergraduates. *Journal of American College Health, 56*(6), 706-715.

Maggio, J.C., White Jr., W.G., Molstand, S., & Kher, N. (2005). Prefreshman summer programs' impact on student achievement and retention. *Journal of Developmental Education, 29*(2), 2-33.

Peck, J., Chivers, L., & Lincoln, Y. (2010). Learning support: Student perceptions and preferences. *Art Design and Communication in Higher Education, 9*(2), 135-149.

Reinheimer, D., & McKenzie, K. (2011). The impact of tutoring on the academic success of undeclared students. *Journal of College Reading and Learning, 41*(2), 22-36.

Sanchez, R.J., Bauer, T.N., & Paronto, M.E. (2006). Peer-mentoring freshmen: Implications for satisfaction, commitment, and retention to graduation. *Academy of Management Learning & Education, 5*(1), 25-37.

Santee, J., & Gakavalia, L. (2006). Peer tutoring programs in health professional schools. *American Journal of Pharmaceutical Education, 70*(3), 1-10.

Secomb, J. (2008). A systematic review of peer teaching and learning in clinical education. *Journal of Clinical Nursing, 17*(6), 703-716.

VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. *Educational Psychologist, 46*(4), 197-221.