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Tutoring Center Effectiveness: The Effect of Drop-In Tutoring

While tutoring as a whole has been demonstrated to improve student learning across a variety of subjects and age groups, there is little published evidence for the effectiveness of drop-in tutoring at the undergraduate level. This type of tutoring can be derided as homework help; however, it is clear from this study that students who made use of the Tutoring Center (TC) regularly gained more academically than simply help with an individual class. In fact students who visited the TC more than 10 times per quarter had approximately 10% higher rates of persistence and approximately 0.2 points higher average GPA's than students who infrequently visited or who do not visit the TC during their first year of college.

When reviewing the literature on academic support styles, there is considerable evidence for the effectiveness of traditional one-on-one tutoring where a single tutor meets regularly with a single student to improve the learning and understanding of the student (Cohen & Kulik, 1981; Hartman, 1990; Topping, 1996). However, many colleges and universities choose not to or cannot afford to make individual tutoring available to their students. Instead, tutoring centers or learning labs at many institutions provide tutoring support to a number of students simultaneously. While it is assumed that students receive the same or similar benefit from tutoring in a center as they would from individual tutoring, "there is a lack of conclusive evidence to provide the rationale for the widespread implementation of effective peer tutoring programs in college settings" (Lildren & Meier, 1991, p.69). This lack of evidence may, in part, be due to the small effect tutoring has on college students' grades when compared to other academic success factors, such as time management skills, relationships, or employment, and may be further complicated because "little is known about the people being peer tutored in higher education…and about how being

tutored by more advanced students develops students abilities" (Saunders, 1992, p.215). Indeed there is speculation that "the population of students seeking tutoring may be more diverse than the general student population on a particular campus" (Dvorak, 2004, p.41). The diversity of college populations may be one issue that decreases effect size for tutoring in college. In the literature, most studies of successful tutoring focus on single classes, single grades, or single subjects in controlled situations where tutoring occurs in regular places and at regular times; in other words, homogenous populations. However, in a college setting, particularly in the type of tutoring addressed in this article, the population being measured can come from entirely different academic, ethnic, socioeconomic, and regional backgrounds. The resulting heterogeneity of the population may reduce the measurable effects of tutoring. The purpose of this study, in part, is to address these issues.

In order to address these issues, it is first necessary to specifically describe what type of tutoring occurs. One of the difficulties in discussing tutoring is defining tutoring. Bray (UNESCO, 2007) describes tutoring as the shadow education system, in part because its forms and features are indistinct. For instance, is a tutor someone who is a trained professional, such as a teacher or professor who helps students outside of normal class time, or is a tutor a peer who has greater understanding of course material, or is a tutor a fellow student who simply likes to help? All of these descriptions fit general definitions of tutoring, and examples of each can be found in the literature. Therefore, in order to better classify specific types of tutoring Topping (1996) attempts to classify tutoring into fundamental types based on the nature of the tutor and the tutor's role in the learning experience. The Tutoring Center (TC) at Western Washington University (Western) uses a model of tutoring in which students use the TC as a study area where tutors are available and freely circulate among students as they have questions. This model of tutoring is referred to locally as "drop-in tutoring" and loosely fits into Toppings' (1996) dyadic cross-year fixed-role peer tutoring group, in which more experienced students partner with and tutor less experienced students. In this case, the peer tutors are generally juniors and seniors who have performed well academically in the course(s) they tutor. All tutors are required to complete a College Reading and Learning Association certified training program during their first quarter of employment. Training takes place in a two credit class that introduces tutors to some of the fundamentals of student development theory and questioning techniques, and helps develop interpersonal and teaching skills in a tutoring environment. Primarily, tutoring in the TC focuses on general university requirements (GUR's), such as pre-calculus mathematics, science (biology, chemistry,

and physics), and economics, although there are several tutors who are specifically devoted to tutoring study skills.

Assessing the effectiveness of the TC in the past has been extremely difficult because student tracking was practically non-existent, with little accurate data about who used the center, how many times they used the center, or even for what subjects. The addition of the TutorTrac tracking system allowed the TC to keep more accurate student usage records and to merge those usage records with individual student records, which created greater freedom to compare students across different factors. Unfortunately, since accurate tracking began fall quarter 2007, useful data only exists for the past academic year, and therefore it is difficult to get a complete picture about the effectiveness of tutoring across all levels of students. In short, the center cannot assess the effect of tutoring on students who may or may not have used the center before they were accurately tracked. As a result, this analysis focuses on two specific cohorts: 200740F and 200740X. These cohorts represent the entering freshmen class for the fall of 2007, the first class for which we have complete data. At Western, terms are labeled by the year followed by a two digit suffix: 10 for winter, 20 for spring, 30 for summer, and 40 for fall. The two cohorts represent traditional freshmen (200740F) and freshmen Running Start students (200740X). Running Start students enroll in college courses during high school, allowing them to simultaneously earn credit for both high school and college. Since the groups have somewhat different characteristics, they were often analyzed separately; however, in some instances student data for both groups was combined in order to gain statistical power.

Three general categories were evaluated for this assessment: persistence, academic standing, and cumulative grade point average. Within cumulative grade point average, several factors were used as points of comparison: high school GPA, math SAT score, first generation status, and race/ethnicity. When assessing the center's effectiveness, the students were further grouped into categories of center usage: greater than or equal to 10 visits in a quarter, fewer than 10 visits, or no tutoring center visits. The value of 10 visits was selected as the cutoff for the high use group as that number roughly corresponds to one student visit per week.

Method

The TC used TutorTrac software to track student usage statistics during the 2007-2008 academic year. When students entered the center, they ran their student ID cards through a magnetic card reader log into the center, while a receptionist was on hand to ensure that students logged

into the center and to address questions. TutorTrac allowed the center to log the number of visits, track the hours spent in the center, and differentiate students by the classes for which they received tutoring. At the end of the academic year, all student visit information and course grade information was downloaded from TutorTrac and exported to SPSS. In addition, student demographics and admissions information were exported from the university's student information system and matched to the student usage data. The combination of data from these two sources allowed post hoc grouping of students by specific criteria.

In terms of ethnicity and first generation status—two factors typically associated with lower performance—the characteristics of the students who used the center roughly corresponded to the student population. In the two cohorts examined, 33% were first generation students and 25% identified themselves as having an ethnicity other than Caucasian. Of the students who visited the TC at least once during the 2007-2008 academic year 32% were first generation students and 27% identified themselves as other than Caucasian. Since these proportions are similar, the data appears to run contrary to Dvorak's (2004) claim that the population of students receiving tutoring is more diverse than the general student body.

Results

Student Characteristics and Usage

On average minority students visited the TC more often than did Caucasian students ($F = 9.472$, $p = .002$), but there was no significant difference between the visits of first generation and non-first generation students. Similar to other reports of student success (Kezar & Eckel, 2007), for the classes in which students received tutoring, both minority and first generation students had lower average grade point averages than the Caucasian or non-first generation students.

Persistence and Academic Standing

As seen in Tables 1 & 2, there are clearly differences in the rates of persistence of the students (most clearly seen as the percentage of students not enrolled for this term). While Tables 1 and 2 only show a single term, 200840 (Fall 2008 or one year after matriculation), the trend of higher rates of non-enrollment for students who did not visit the TC as compared to students who visited the TC hold for all quarters for which statistics are available. Or, in other words, students who visited the TC 10 or more times were more likely to be still enrolled in school during any given quarter, when compared to students who did not visit the TC or who did so fewer than 10 times.

An issue related to enrollment and persistence is academic standing. Some of the students who were not enrolled after one year were academically dismissed. At Western, good standing is defined as having a cumulative grade point average greater than or equal to 2.0 on 4.0 scale. The other categories of academic standing are academic warning, students who have a single quarter GPA below 2.0, probation, students whose cumulative GPA is below 2.0 for the first time, and continuing probation, students who have a cumulative GPA below 2.0, but who had a quarterly GPA above 2.0 the preceding quarter.

Table 1
200740F Cohort Academic Standing 200840

	>10 Visits		<10 Visits		No Visits	
	Count	Percent	Count	Percent	Count	Percent
NE	12	10.6%	70	14.7%	301	18.1%
GS	98	86.7%	366	76.9%	1239	74.3%
Total	113		476		1667	

NE: Not enrolled this term
GS: Good standing

Table 2
200740X Cohort Academic Standing 200840

	>10 Visits		<10 Visits		No Visits	
	Count	Percent	Count	Percent	Count	Percent
NE	1	9.1%	13	16.0%	48	20.1%
GS	10	90.9%	65	80.2%	174	72.0%
Total	11		81		239	

NE: Not enrolled this term
GS: Good standing

Students who do not maintain a cumulative GPA of at least 2.0, or who are not able to maintain a quarterly GPA of at least 2.2 while in continuing probation, are academically dismissed. Unsurprisingly, since academic standing plays a role in enrollment and persistence, there appears to be a similar trend for both cohorts, in which there is a higher

rate of students in good standing for students who visited the TC than the rate of good standing for students who did not visit the TC.

However, these trends are not necessarily significant. In comparison, the rates of persistence for the 200740F cohort (Table 3) do show there is significant difference between the rates of persistence of both TC visiting groups when compared to the students who did not visit the TC. Unfortunately this trend does not hold for the 200740X cohort (Table 4). Since the rates of persistence are similar across both cohorts, it seems likely that the 200740X cohort is not large enough to have the statistical power necessary to show significance.

Table 3
Differences in Rates of Persistence for 200740F

No Visit v. < 10 Visits		No Visit v. > 10 Visits		< 10 Visits v. > 10 Visits	
z = -1.93	p = .0268	z = -2.07	p = .0192	z = -1.23	p = .1093

No Visit: Student did not visit the TC
< 10 Visits: Student visited the TC between 1 and 9 times
> 10 Visits: Student visited the TC 10 or more times

Table 4
Differences in Rates of Persistence for 200740X

No Visit v. < 10 Visits		No Visit v. > 10 Visits	
z = -.921	p = .1788	z = -.91	p = .1814

No Visit: Student did not visit the TC
< 10 Visits: Student visited the TC between 1 and 9 times
> 10 Visits: Student visited the TC 10 or more times

The relative rate of students in good standing is likewise encouraging on paper, but only the rate of good standing for the 200740F students who visited the TC > 10 times is significant when compared to students who did not visit the TC. As can be seen in Tables 5 and 6, the difference in proportion of students in good standing is not significant to the usual $p = .05$ standard for the 200740X cohort or when comparing the difference in rates of good standing for the students who did not visit the TC as compared to the students who visited the TC fewer than 10 times for the 200740F cohort. However, these other analyses approach

significance and therefore it seems likely that future analyses, which include more students across more cohorts, will show a clear difference between these groups.

Table 5
Differences in Rates of Good Standing for 200740F

No Visit v. < 10 Visits		No Visit v. > 10 Visits	
z = 1.20	p = .1151	z = 2.85	p = .0022

No Visit: Student did not visit the TC
< 10 Visits: Student visited the TC between 1 and 9 times
> 10 Visits: Student visited the TC 10 or more times

Table 6
Differences in Rates of Good Standing for 200740X

No Visit v. < 10 Visits		No Visit v. > 10 Visits	
z = 1.37	p = .0853	z = 1.28	p = .1003

No Visit: Student did not visit the TC
< 10 Visits: Student visited the TC between 1 and 9 times
> 10 Visits: Student visited the TC 10 or more times

In sum, freshmen who visited the TC more than 10 times in a quarter during their first year at Western had statistically higher rates of persistence and were statistically more likely to be in good academic standing than students who did not visit the TC. Likewise, freshmen who visited the TC at least once during their first year were still more likely to persist than students who did not visit the TC. Therefore, there is a positive relationship between tutoring and persistence. Unfortunately, under normal operating conditions it is practically impossible to discern a causal relationship between tutoring and persistence as the students using the center, and the number of times they use it, are self selected. However, by looking at other factors, such as correlation between tutoring visits and GPA, a clearer picture of the effect of tutoring will emerge.

Cumulative GPA

There is obviously a link between cumulative GPA and the academic standing of a student; therefore it comes as no surprise that there is a

significant difference between the average cumulative GPA's for the three groups: students who visited the TC more than 10 times, students who visited the TC fewer than 10 times, and students who did not visit the TC. As seen in Table 3, there is a significant difference between the mean cumulative grade point averages for the three groups. A contrast statistically shows what is very clear in Figure 1, that the real difference in mean GPA's lies between the students who visited the TC more than 10 times and those who did not visit at all (p = .029). Again, while only the cumulative GPA graph for 200840 (Figure 1) is included, there is a significant difference in the GPA's for all reported quarters (see Table 7).

Table 7
Analysis of Variance for Cumulative GPA

Cumulative GPA		df	F	p
Winter 2008 (200810)	Between Groups	2	4.581	0.01
	Within Groups	2183		
Spring 2008 (200820)	Between Groups	2	6.315	0.002
	Within Groups	2112		
Fall 2008 (200840)	Between Groups	2	7.387	0.001
	Within Groups	1889		

Clearly, one of the concerns with this kind of data is whether the students who visit the TC more than 10 times per quarter are merely above-average students and as a result any real difference in GPA is attributable to the students and not to the activities of the TC. To correct for this possibility, the average GPA of the three groups was compared across several conditions, notably math SAT score, high school GPA, ethnicity, and first generation status. First, in all four conditions there was no significant interaction between the three visitation categories therefore the main effect of visiting the TC holds across race/ethnicity, SAT score, high school GPA, and first generation status. Again, these trends hold across multiple quarters, but for simplicity's sake only the values for 200840 are included (see Figures 2-5). While the lack of interaction does not answer the question of the effectiveness of tutoring in the TC

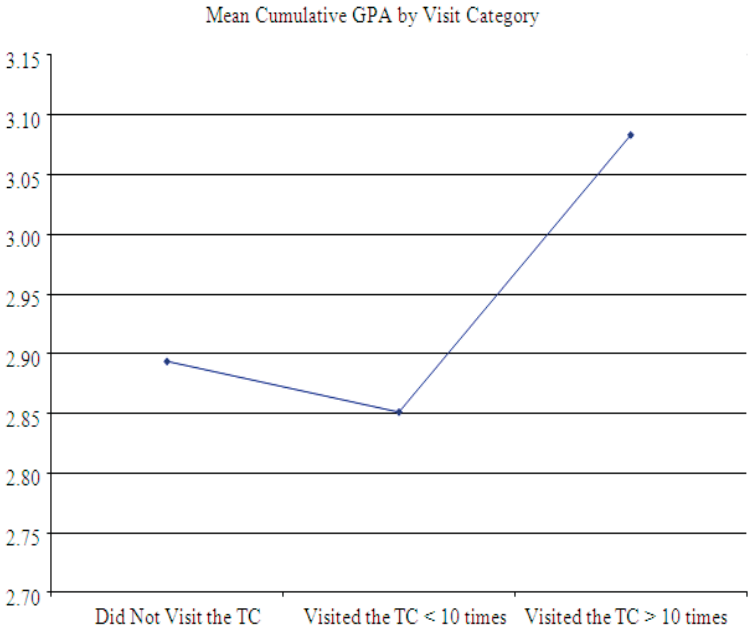

Figure 1. **Mean cumulative GPA by visit category**

directly, the cumulative GPA of students who visited the TC more than 10 times is higher across all categories of each condition, which seems to indicate that when comparing students with similar characteristics, tutoring in the TC may have a positive effect.

One final area of interest when looking at GPA is the correlation between visits to the TC and grades. Looking at the outcomes for individual classes has been problematic in determining how much of an effect tutoring has on grades. With this style of tutoring, it is also difficult to determine exactly what a valid outcome is for students who visit the center. When speaking with faculty and administrators, many assume students who receive tutoring will perform better in class than students who do not, and, in an idealistic sense, it is easy to expect that students who receive tutoring will perform better in class and receive a higher grade than students who do not. However, there is usually no significant difference in course performance between students who visited the TC and those who did not. Or, in the few cases when there is a significant difference, the students who visited the TC performed worse than students who did not. This difficulty may be due in part to

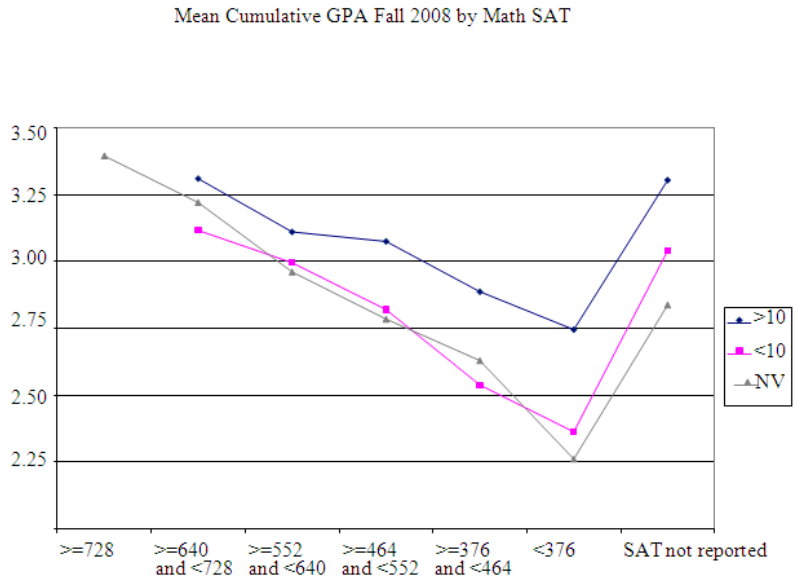

Figure 2. **Mean Cumulative GPA Fall 2008 by Math SAT**

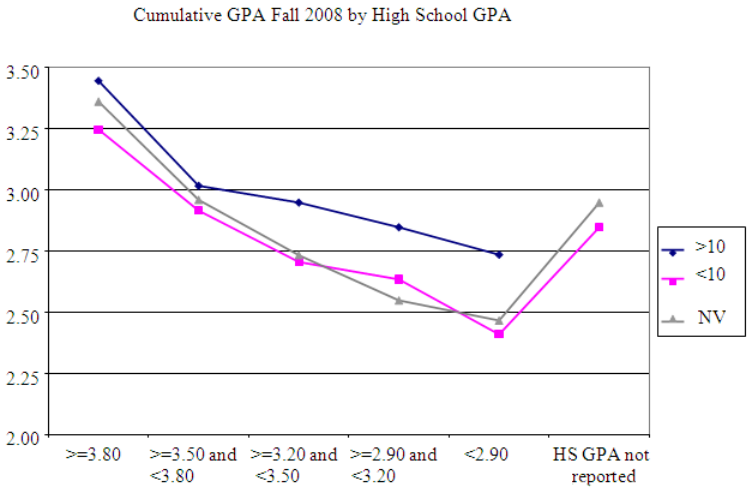

Figure 3. **Mean Cumulative GPA Fall 2008 by High School GPA**

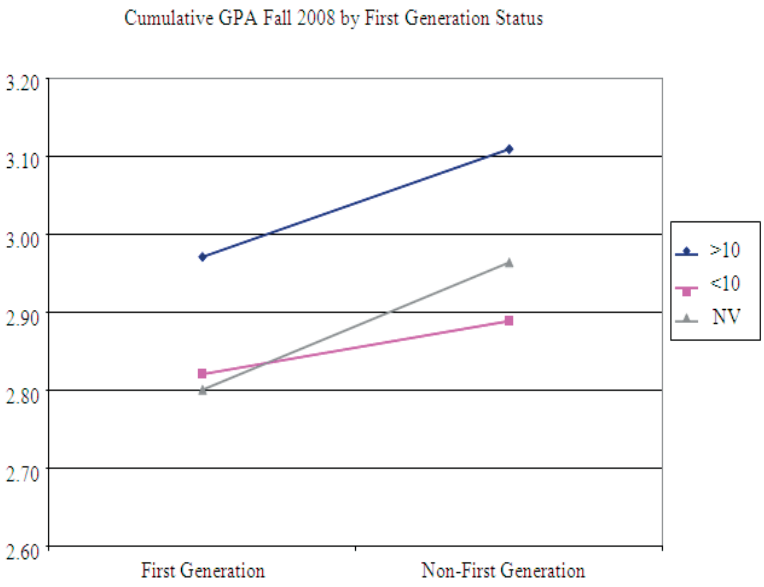

Figure 4. **Mean Cumulative GPA Fall 2008 by First Generation Status**

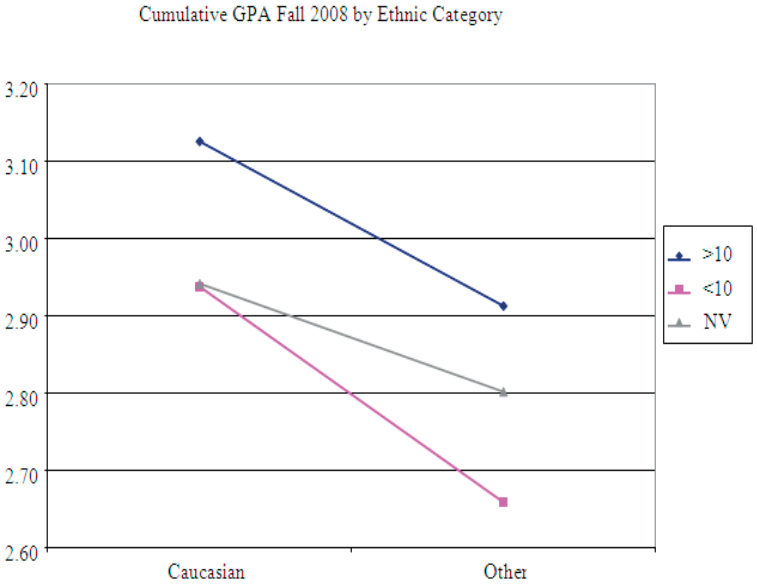

Figure 5. **Mean Cumulative GPA Fall 2008 by Ethnic Category**

the relatively small proportion of students who visit the TC from a given class. Alternatively, since students who use the TC self select, we could be connecting with our target students (students who need academic help) who could have performed even lower had they not received tutoring. Further, as noted by Topping (2005, p.635) "even in the research literature there are occasional reports of peer learning programs which did not show significant effects." However, when looking at the 200740F cohort specifically there was a pattern of correlation between the number of visits and the total hours spent in the TC with the cumulative GPA of subsequent quarters. For example, when considering the effect of fall quarter TC visits, one would expect to see a correlation between the number of TC visits with fall GPA, or perhaps a correlation with winter quarter cumulative GPA. However, for the 200740F cohort, there was a significant correlation between fall quarter usage and spring quarter cumulative GPA ($r = 0.127$, $p = .021$). Similarly, there was a positive, significant correlation between winter quarter TC usage and cumulative GPA the following fall quarter ($r = 0.149$, $p = .023$). In short, there was a delay between when we expect a correlation between TC visits to appear, and when that correlation actually appeared. It should be noted there was a nearly significant correlation ($p < .10$) for the quarter immediately following when tutoring occurred, and once again, it is hoped that future analysis with more students across more cohorts will provide the statistical power necessary to determine the significance of this effect. Also, there was no significant correlation between visits and cumulative GPA for the 200740X cohort, but it seems likely this was due to lower statistical power as a result of a smaller N. If the two cohorts are combined, the pattern of significant, delayed correlation persists. These correlations may in fact represent the best indicator of the effectiveness of drop-in tutoring at the TC (see Table 8). Other explanations for the correlation between student visits and cumulative GPA exist. For example, TC usage may be a proxy for time on task, but if these other explanations are correct then the correlation between visits and GPA should exist across all quarters, including quarters that preceded tutoring and not just after students visited the center. Thus, it seems the most likely explanation for the correlation is the intervention offered through tutoring.

Table 8
Correlation between Visits and Cumulative GPA

	GPA 200810	GPA 200820	GPA 200840
Visits 200740	0.091^	0.127*	0.126*
Visits 200810	0.065	0.106^	0.149*
Visits 200820	0.097	0.09	0.087

* Correlation is significant at the .05 level
^ Correlation is significant at the .10 level

Conclusion

Freshmen who visited the TC more than 10 times in a quarter during the first year at Western had statistically higher rates of persistence and were statistically more likely to be in good academic standing than students who did not visit the TC. Likewise, freshmen who visited the TC at least once during their first year were still more likely to persist than students who did not visit the TC, but their rate of good standing was not significantly higher.

Similarly, students who visited the TC more than 10 times in a quarter, had a significantly higher cumulative GPA than students who did not visit the TC or who visited fewer than 10 times. This trend holds across several factors including race/ethnicity, SAT score, and high school GPA. Past attempts to correlate number of visits and hours spent in the TC with the eventual grade in a class have seldom found a significant correlation, but there is a delayed correlation between student visits and cumulative GPA, which may be indicative of successful tutoring.

While all of these findings are only applicable to the fall 2007 freshmen entering class, it seems likely these results can be extrapolated to other similar cohorts. Similarly, because the findings apply across a variety of factors, it is likely that other colleges and universities will see similar outcomes despite differences in student demographics. Clearly more data is necessary, but at least on initial exploration, drop-in tutoring appears to be an effective means of improving student retention and academic standing. There are several important next steps that must occur in this line of research. First, similar evaluations of student outcomes must occur at other institutions that provide tutoring services. Second, as the body of knowledge in the literature increases, a meaningful comparison can be made about the comparative effectiveness of different forms of tutoring. As colleges and universities seek to boost retention and pro-

vide academic support for students, while meeting tightening budgets, meaningful analyses of tutoring will allow faculty and administrators to make informed decisions about what services will best meet the needs of their students and their institution.

References

Cohen, P. A. & Kulik, J. A. (1981). Synthesis of research on the effects of tutoring. *Educational Leadership*, *39*(3), 227-229.

Dvorak, J. (2004). Managing tutoring aspects of the learning assistance center, *Research for Educational Reform*, *9*(4), 39-51.

Hartman, H. J. (1990). Factors affecting the tutoring process. *Journal of Developmental Education, 14*(2), 2-4, 6.

Kezar, A. & Eckel, P. (2007). Learning to ensure the success of students of color: a systematic approach to effect change. *Change*, *39*(4), 18-21.

Lildren, D. M. & Meier, S. E. (1991). The effects of minimal and maximal peer tutoring systems on the academic performance of college students. *Psychological Record*, *41*(1), 69-77.

Saunders, D. (1992). Peer tutoring in higher education. *Studies in Higher Education*, *17*, 211-218.

Topping, K. J. (1996). The effectiveness of peer tutoring in further and higher education: a typology and review of the literature. *Higher Education*, *32*, 321-345.

Topping, K. J. (2005). Trends in peer learning. *Educational Psychology*, *25*, 631-645.

United Nations Educational, Scientific, and Cultural Organization (2007). *The shadow education system: Private tutoring and its implications for planners*. Author: Bray, M.

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