Assessing Impact of Academic Interventions Through Student Perceptions of Academic Success

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Abstract

In Fall 2016, the Student Success Center at the University of Tennessee, Knoxville began a two-year study to assess participant impacts of three key academic success programs: academic coaching, tutoring, and Supplemental Instruction (SI). Survey results revealed that participants perceived academic impacts in all three programs and that students who attended more frequently had higher levels of perceived academic impact. The following article provides an overview of the study purpose, methodology, data collection, analysis and study findings. Study conclusions are presented along with implications and next steps for future research.

Introduction

Why do some college students struggle while others succeed? As faculty, staff, and higher education practitioners, this is a question we hear regularly. Researchers have made significant progress in the last decades in answering this question (Astin, 1993; Bain 2012; Dweck, 2006; Duckworth, 2016; Kuh, 2008; Pabloma & Banton, 1999; & Tinto, 2012). However, for practitioners in higher education, knowing how these programs directly impact participants and influence student success is a challenge. The following paragraphs outline how the Student Success Center (SSC) at the University of Tennessee, Knoxville used student surveys to assess the impact of three key academic interventions, academic coaching, Supplemental Instruction (SI), and tutoring, to gain a better understanding of the ways in which these programs impact student success.

Study Context: Student Success Center

Founded in 2005, the Student Success Center's vision is "to foster a campus culture of engaged and capable learners who are co-creators and designers of their own path to graduation and future success in a diverse and global society" (Student Success Center Website, 2017). The Center's mission is "to ensure that all students have the opportunity to succeed by providing campus leadership and advocacy for student success at UT, identify and implement academic success programs that support progress toward graduation, and enrich the undergraduate student experience" (Student Success Center Website, 2017). The SSC accomplishes these goals through high impact academic support programs: academic coaching, SI, tutoring, and other programmatic support initiatives. The SSC measures impact through analysis of overall contacts and number of students utilizing SSC services; frequency of use of SSC services; comparisons in success indicators such as retention, GPA, and academic standing between comparable groups, SSC users, and the general population; student surveys; and staff needs assessments (Student Success Center Comprehensive Assessment Report, 2018).

Previously gathered SSC data has regularly shown that students who participate in support programs perform better academically than students who do not participate (SSC Comprehensive Assessment Report, 2018). Evidence of this success is reflected through both higher retention rates and higher grade point averages for participating students, as evidenced in Figure 1 and 2 below, which illustrate that students who participate in these services perform better academically. Additionally, students show that they value SSC services through repeat and increasing usage, with a 60% increase in academic coaching visits, a 31% increase in SI visits, a 90% increase in tutoring visits, and an overall usage increase of 34% over the last four years, and through satisfaction ratings of 93% or higher (SSC Comprehensive Assessment Report, 2018).

Figure 1: Spring 2018 SI Participant Attendance and GPA Comparison
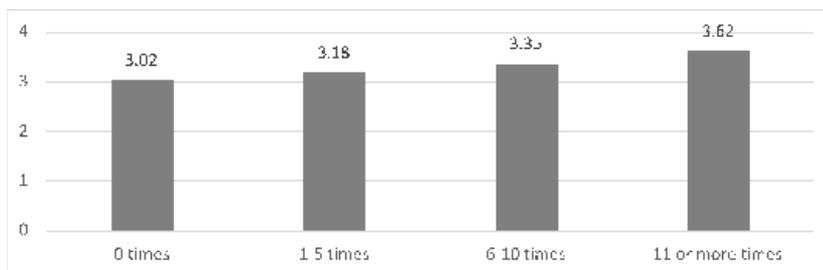
Figure 2: Retention Rate by Frequency of Usage 15 – 16 Academic Year

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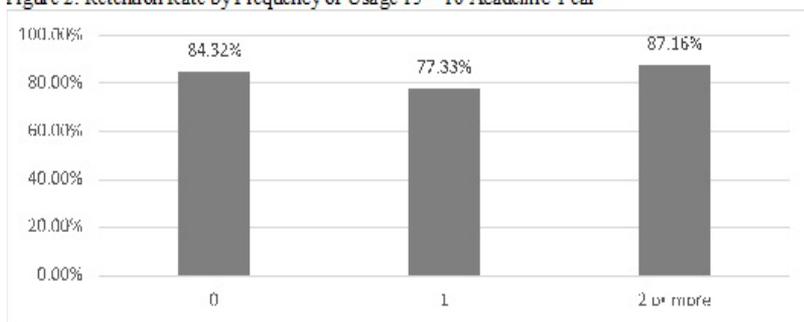
Study Need and Purpose

The purpose of this study was to assess academic impacts on student success after participation in academic coaching, tutoring, and / or SI. SSC staff also sought to better understand what students perceive as most impactful to their academic success after attending any one of the three academic interventions most used by undergraduate students. Specifically, this study seeks a better understanding of what specific actions, changes, or behaviors occur in students due to participation in these services, to assess the levels at which these actions, changes, or behaviors occur, and to determine what changes, if any, were needed to improve the program.

There were three guiding research questions for this study as outlined in the table below, along with the method of analysis for each.

Table 1. *Research Questions and Methods of Analysis*	
Research Question	**Method of Analysis**
1. To what extent do students perceive positive academic impact from participation in coaching, tutoring, and/or SI?	Descriptive Statistics and One-way ANOVA
2. Is there a relationship between rates of participation and perceived levels of impact?	One-way ANOVA
3. Are there group differences between student demo/biographic variables and perceived levels of impact?	One-way ANOVA and T-tests

Literature Review

Practitioners in higher education have struggled for decades to determine how best to evaluate programs and assess student academic success (Pabloma & Banta, 1999). In many instances, practitioners and researchers have found that survey research can be beneficial in answering this question (Fowler, 2009). This can be particularly true when assessing academic support programs such as academic coaching, tutoring, and SI.

The field of academic coaching, being relatively new (Robinson, 2015), has a limited number of studies. Several research studies on academic coaching in higher education find that academic coaching can "be a powerful intervention in encouraging student academic success" (Dalton & Crosby, 2014, p. 59). Research by Bettinger and Baker (2011) illustrates that coaching can potentially increase student persistence (assessed as being enrolled one year after participation in coaching). Chamblis and Takacs (2014) argue that developing relationships with campus staff (such as those that form during academic coaching) can have a positive impact on student success. However, the pool of research for this academic support program is still quite small. Given the limited but compelling research, more assessment in this field is clearly needed.

In contrast, SI and tutoring research is ubiquitous. Research on supplemental instruction has found that SI can have significant short- and long-term impact on student success (Ogden et. al. 2003). Additional studies have shown that SI impacts both short-term success in the specific course as well as having positive benefits on student retention and persistence (Ramirez, 1997). Research on the

impact of tutoring is also wide-spread. Arco-Tirado and associates (2011) found that participation in tutoring in their study resulted in improved grade point averages, success and performance rates, and increased learning strategies for participating students. Additionally, Topping's (1996) article provides an extensive overview of the results in assessing tutoring and their findings. Missing from this research, however, is a discussion of student perceived levels of impact from participation. The following study aims to address these gaps.

Methods

To conduct this study, SSC staff designed a two-year-long study focused on best practices in survey research. The study began in the Fall 2016 semester and continued through the Spring 2018 semester. Initial design efforts included meetings with Assistant Directors and coordinators of each program to gain insight into what questions and topics should be addressed in the survey. The team drafted initial questions for each program related to impact on student success and mapped out a basic outline and structure for the study, as described below. When designing this study and instrumentation, specific care was taken to consider use and the ways in which this study could be beneficial to SSC staff and stakeholders (Patton, 2012).

Participants

Study participants included undergraduate students at the University of Tennessee, Knoxville who had participated in any of the three academic interventions during that academic term. Through SSC usage data, the researcher was able to contact, via e-mail, any student who participated in any of the three academic resources to ask if they would consent to participate in the study. The electronic survey with an embedded informed consent was sent to students between mid-terms and finals, a timeframe that staff felt would be most conducive both in terms of response rates and to see evidence of impact. This study followed a prescribed UTK IRB protocol, which allowed students to choose not to participate or to opt out at any time. Participants were informed of any potential risks, informed of the confidentiality of their data, and were provided information on how to view results at the culmination of the study.

Instrument

After the initial survey content was developed by staff, the researcher formulated these topics into Likert scale questions organized by program (Appendix A). Questions focused on elements of academic impact that staff felt were most likely to occur for each intervention, as described in the below table. Additionally, each section asked for one open-ended response related to any other areas of perceived impact related to that initiative. The survey concluded with demographic and biographic questions. Reliability was assessed through analysis of subscales for academic coaching, SI, and tutoring; all three subscales for the instrument demonstrated high reliability: Academic coaching ($\alpha = .93$), supplemental instruction ($\alpha = .94$), and tutoring ($\alpha = .95$). Face validity was achieved through item development based on previous SSC data.

Table 2. *Example Survey Questions and Corresponding Intervention*

Survey Question	Intervention
I feel more prepared for my classes	Academic Coaching
I am more proactive	Academic Coaching
I manage my time better	Academic Coaching
I have a clearer understanding of my academic goals	Academic Coaching
I have a clearer understanding of academic policies	Academic Coaching
I am more proactive	Academic Coaching
I manage my time better	Academic Coaching
I am a better student now than I was prior to attending [this resource]	Tutoring and SI
I plan on using one or more of the learning strategies discussed today	Tutoring and SI
I am more likely to review and study course material	Tutoring and SI
I am more likely to attend class	Tutoring and SI
I have better understanding of the course material	Tutoring and SI
I am more likely to ask my professor questions	All
My course grade(s) has/have improved	All
I am likely to continue using [this resource]	All
I am likely to refer my friends to [this resource]	All
I have greater confidence	All
Overall, [this resource] has positively contributed to my academic success	All

Data Analysis

At the end of each term, researchers analyzed descriptive statistics and shared results with staff. After two years, a summary of descriptive statistics was calculated and analysis of variance (ANOVA) was conducted. Response rates were tracked each semester, with overall response rates of 8.56% in the 16 – 17 academic year and 10.49% in the 17 – 18 academic year.

Composited averages were calculated for academic coaching, SI, and tutoring subscales and utilized as dependent variables for analysis of variance. Group mean differences for number of visits and demographic characteristics were tested for each dependent variable. After testing the assumptions for each ANOVA, it was determined that the residuals for all three dependent variables were slightly skewed between the number of visits and demographic variables. However, as ANOVA tests are generally robust to violations of normality (Tiku, 1975; Ito, 1980; Tan, 1982), the dependent variables remained unchanged. In cases when homogeneity of variance was violated, the Welch correction was implemented. Table three below provides an overview of descriptive statistics from this analysis.

Table 3. Frequencies and Percentages of Participants

Variable	n	%
Class Level		
First Year Freshman	219	48.7
First Year Transfer	23	5.1
Second Year Student	108	24.0
Third Year Student	67	14.9
Fourth Year Student	33	7.3
Expected Education Level		
Some college	37	8.3
Bachelor's degree	118	26.5
Master's degree	124	27.8
Doctoral or professional degree	167	37.4

Parents Education Level

Did not finish high school	5	1.1
High school diploma/ G.E.D.	73	16.3
Attended college but no degree	37	8.3
Associate's degree	42	9.4
Bachelor's degree	123	27.5
Master's degree	109	24.4
Doctoral or professional degree	58	13.0

Gender

Man	110	24.5
Woman	333	74.2
Another gender identity (specify)	4	0.9
I prefer not to respond	2	0.4

Race/Ethnicity

American Indian or Alaska Native	1	0.2
Asian	28	6.3
Black or African American	29	6.5
Hispanic or Latino	13	2.9
Native Hawaiian or Other Pacifiic Islander	1	0.2
White	338	75.8
Other (please specify)	6	1.3
I prefer not to respond	10	2.2
Mixed Race (please specify)	20	4.5

Distance from U.T.

|		
0-60 miles	137	30.9
61-120 miles	51	11.5
121-180 miles	74	16.7
181-240 miles	74	16.7
More than 240 miles	107	24.2

Results

At the end of each term, descriptive statistics showed that students who participated in all three resources reported high perceived impact on their academic success, and the final analysis of combined data illustrated similar results. Students participating in any of the three programs perceived impact on their academic success, with the highest levels of the perceived impact occurring for students who attended more frequently. There were no differences when analyzing levels of perceived impact across demographic or biographic student characteristics. Figures 3 through 5 below provide an overview of student perceived impact on their academic success

from participating in these services. These results illustrate that students perceive high levels of impact on their academic success in many key actions and behaviors related to academic success.
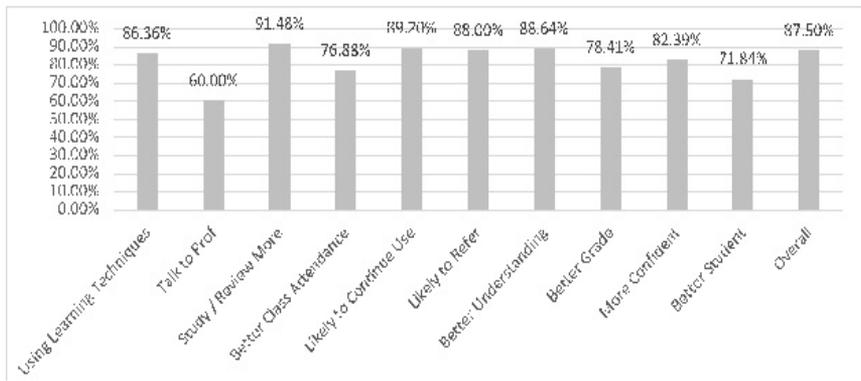
Figure 3: % of Students with Agree or Higher of Perceived Levels of Impact from Academic Coaching

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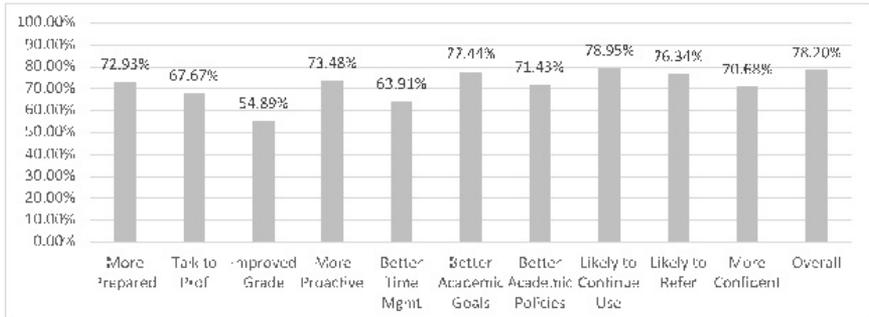
Figure 4: % of Students with Agree or Higher of Perceived Levels of Impact from SI

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Figure 5: % of Students with Agree or Higher of Perceived Levels of Impact from Tutoring

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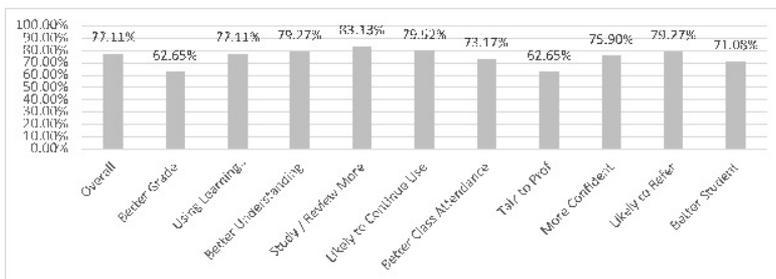
Academic Coaching

The analysis of variance indicated a significant main effect for the number of visits on academic coaching, $F(2, 290) = 8.29$, $p < .001$, $\eta_p^2 = .05$. A posthoc analyses utilizing Tukey's HSD demonstrated that academic coaching impact was higher ($p < .001$) for students who had visited 5 or more times ($M = 4.22, SD = .63$) than for students that had only visited 1 to 2 times ($M = 3.78, SD = .83$). Cohen's effect size value ($d = .60$) suggested a moderate to high practical significance. Students visiting 3 to 4 times showed no significant mean differences with the other two groups in academic coaching.

Supplemental Instruction

There was a significant main effect for the number of visits on SI, $F(2, 308) = 17.92, p < .001$, $\eta_p^2 = .10$. Tukey's HSD demonstrated that SI impact for students who had visited 10 or more times ($M = 4.52, SD = .64$) was significantly higher ($p < .05$) than students that had visited 5 to 9 times ($M = 4.26, SD = .74$). Cohen's effect size value ($d = .39$) suggested a small to moderate practical significance. Students who had visited 10 or more times was also significantly higher ($p < .001$) than students who had visited 1 to 4 times ($M = 3.94, SD = .80$). Cohen's effect size value ($d = .80$) suggested a high practical significance. Furthermore, students who had visited 5 to 9 times also reported higher SI impact ($p < .05$) than those who visited 1 to 4 times. Cohen's effect size value ($d = .40$) suggested a small to moderate practical significance.

Tutoring

A Welch's F test was conducted as the homogeneity of variance assumption was not met ($p < .05$) between the number of visits and tutoring impact. Results indicated a significant difference in group means for number of tutoring visits, Welch's $F(2, 100.42) = 4.20, p < .05$, $est\ \omega^2 = .04$. A Games-Howell post hoc procedure was performed to determine specific group mean differences. Results indicated that tutoring impact for students who had only visited 1 to 2 times ($M = 3.78, SD = 1.06$) was significantly lower ($p < .05$) than for students that had visited 3 to 4 times ($M = 4.19, SD = .61$) and significantly lower ($p < .05$) than students who had visited 5 or more times ($M = 4.19, SD = .82$). Cohen's effect size values were .48 and .44

respectively indicating a small to moderate practical significance for both group comparisons.

Discussion

The perceived impact of academic coaching proved significant between the number of visits when comparing students who visit infrequently (1 to 2 times) to students who visit frequently (5 or more times). This data is consistent with descriptive statistic findings that show higher grade point averages for students who use academic coaching frequently (SSC Comprehensive Assessment Report, 2018). These findings suggest that students perceive the highest levels of impact from academic coaching when visiting 5 or more times.

Supplemental Instruction (SI) also provided conclusive findings. Students attending SI 10 or more times experienced significantly higher impact than all other groups. As SI sessions occur twice weekly throughout the semester, this high rate of attendance connected to perceived impact is reasonable. Differentiated from academic coaching, even students that attended 5 to 9 times still experienced a significant impact, although not as high as those that attended 10 or more times. Again, the conclusion from this finding is that more participation in these services equates to higher levels of perceived academic impact.

Tutoring likewise, showed significant findings for the groups with more visitations. Students who visited 3 to 4 times or 5 or more times demonstrated higher impact than only attending tutoring 1 to 2 times. However, there was no differentiation in significance between the higher two visiting groups. In addition, significant results could not be confirmed through additional testing with a log-transformed dependent variable or non-parametric test.

A lack of significant differences across groups in student demographic and biographic characteristics, in this case, is positive. Regardless of race, background, or other factors, students who attend these academic support programs perceive levels of impact at the same rates.

Overall, the combination of descriptive statistics from previous SSC data analysis, descriptive statistics from this survey, and results

from analysis of variance show that all three of these programs have a substantial impact on student academic success. Students perceive participation in these programs to positively impact student success, and descriptive statistics and increased usage further illustrate this point.

Limitations and Next Steps

Limitations for this study include concerns related to participant response rate and the lack of non-convenience sampling. However, these limitations are mitigated some by recent research that shows that low response rates can still provide beneficial data (Fosnacht, et. all 2017; Kano et. all 2008). Additionally, the pairing of survey results with previous SSC data analysis, and the consistency of these results when compared provide some alleviation to the concerns of participant response bias.

We believe the framework and process used in this study can be replicated by student success centers and support programs within higher education to assess impact and student academic success. It is our hope that this study can be used to replicate results in similar contexts to provide more information and reporting abilities for higher education practitioners. In that vein, we plan to replicate this study in the future with other SSC support services and programs.

References

Arco-Tirado, J., Fernandez-Martin, F.D., & Fernandez-Balboa, J-M. (2011). The impact of a peer-tutoring program on quality standards in higher education. *Higher Education. 6*(62). P. 773-788.

Astin, A. W. (1993). *What matters in college: Four critical years revisited.* San Francisco, CA: Jossy-Bass Publishers.

Bain, Ken (2012). What the best college students do. Cambridge, MA: President and Fellows of Harvard College.

Deci, E. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, *18*(1), 105 – 115. doi: 10.1037/h0030644

Dweck, C.S. (2006). Mindset: The new psychology of success, how we can learn to fulfill our potential. New York: Ballentine Books.

Duckworth, A. (2016). Grit: The power of passion and perseverance. New York: Scribner Books.

Fosnacht, K., Sarraf, S., Howe, E., & Peck, L.K. (2017). How important are high response rates for college surveys? *The Review of Higher Education (40)*2, pp. 245 – 265).

Fowler, F.J. (2009). Survey Research Methods. Sage Publications: Thousand Oakes, California.

Harlow, H. F, Harlow, M.K. & Meyer, D.R. (1950). Learning motivated by a manipulation drive. *Journal of Experimental Psychology, 40(2),* 228 – 224. doi: 10.1037/h0056906

Headden, S. & McKay, S. (2015). *Motivation matters: How new research can help teachers boost student engagement*. Stanford, CA: The Carnegie Foundation for the Advancement of Teaching. Retrieved from www.carnegiefoundation. org.

Ito, K. (1980). Robustness of ANOVA and MANOVA test procedures. In Handbook of Statistics, Vol. 1, (P. R. Krishnainh, ed.), Amsterdam, Holand, 1980.

Kano, M., Franke, T., Afifi, A.A., & Bourque, L.B. (2008). Adequacy of reporting results of school surveys and nonresponse effects: a review of the literature and a case study. *Educational Researcher (37)*8, pp. 480 – 490.

Kuh, G. (2008). *High-impact educational practices: what they are, who has access to them, and why they matter*. Washington, D.C: Association of American Colleges and Universities.

Ogden, P, Thompson, D., Russell, A., Simons, C. (2003). Supplemental Instruction: Short and long-term impact. *Journal of Developmental Education 3*(26). P 2-4,6,8.

Palomba, C.A. & Banta, T.W. (1999). Assessment essentials: planning, implementing, and improving assessment in higher education. *Jossey-Bass*, San Francisco.

Patton, M. Q. (2012) *Essentials of utilization-focused evaluation*. Los Angeles, CA: Sage Publications.

Prospero, M., & Vohra-Gupta, S. (2007). First generation college students: Motivation, integration, and academic achievement. *Community College Journal of Research and Practice*, *31*(12), 963 – 975. doi: 10.1080/10668920600902051

Ramirez, M. (1997). Supplemental Instruction: Long-term impact. *Journal of Developmental Education 1*(21). P2-6.

Robinson, C.E. (2015). *Academic / Success Coaching: A description of an emerging field in higher education.* (Doctoral dissertation). Retrieved from http://scholarcomons.sc.edu/etd/3148.

Ryan, M. R. & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology 1*(25). Pg. 54-67.

Pink, D. H. (2009). Drive: The surprising truth about what motivates us. New York: Riverhead Books.

Student Success Center. (2018). Comprehensive Assessment Report. Retrieved from studentsuccess.utk.edu/assessment.

Student Success Center. (2018). Student Success Center Website. Retrieved from studentsuccess.utk.edu/about.

Tan, W. Y. (1982). Sampling distributions and robustness of t, f and variance-ratio in two samples and ANOVA Models with respect to departure from normality. Communications in Statistics-Theory and Methods, 11:2485–2511.

Tiku, M. L. (1975). Laguerre series forms of the distributions of classical test statistics and their robustness in non-normal situations. In Applied Statistics (R. P. Gupta, eds), New York, American Elsevier.

Tinto, V. (2012). Completing college: Rethinking institutional action. Chicago, IL: The University of Chicago Press.

Topping, K.J. (1996). The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. *Higher Education. 3*(32). pp.321-345.

Volet, S. E. (1991). Modeling and coaching of relevant metacognitive strategies for enhancing university students' learning. *Learning and Instruction, 1*(4), 319 –336. doi: 10.1016/0959-4752(91)90012-W

Appendix A: Survey

Student Success Center Impact Survey: Assessing Impact of Primary Services
The University of Tennessee, Knoxville

Academic Coaching

How many times did you attend academic coaching within the last academic year?
0 times
1-2 times
3-4 times
5 or more times

Were you required to attend academic coaching?
Yes
No

Please respond with your level of agreement to the below statements based on your experience of academic coaching.

As a result of attending academic coaching: (Likert Scale Strongly Disagree – Strongly Agree)

I feel more prepared for my classes.
I am more likely to ask my professor questions before, during,   or outside of class.
My course grades have improved.
I am more proactive.
I manage my time better.
I have a clearer understanding of my academic goals.
I have a clearer understanding of academic policies.
I am likely to continue utilizing academic coaching.
I am likely to refer my friends for academic coaching.
I am more confident now about doing well at UT than I was prior to attending academic coaching.
Overall, coaching has positively contributed to my academic success.

Supplemental Instruction

How many times did you attend supplemental instruction (SI) within the last academic year?
0 times
1-4 times
5-9 times
10 or more times

Please respond with your level of agreement to the below statements based on your experience of supplemental instruction (SI).

As a result of attending SI: (Likert scale Strongly Disagree – Strongly Agree)
I plan on using one or more of the learning techniques (strategies) discussed.
I am more likely to ask my professor questions before, during, or outside of class.
I am more likely to review and study course material.
I am more likely to attend class.
I am likely to continue utilizing supplemental instruction if available.
I am likely to refer my friends to supplemental instruction.
I have a better understanding of the course material.
My course grade has improved.
I am more confident now about doing well at UT than I was prior to attending SI.
I am a better student now than I was prior to attending SI.
Overall, supplemental instruction has positively contributed to my academic success.

Tutoring
How many times did you attend tutoring within the last academic year?
0 times
1-2 times
3-4 times
5 or more times

Please respond with your level of agreement to the below statements based on your experience of tutoring. As a result of attending tutoring: (Likert scale Strongly Disagree – Strongly Agree)

I plan on using one or more of the learning techniques (strategies) discussed.
I am more likely to ask my professor questions before, during, or outside of class.
I am more likely to review and study course material.
I am more likely to attend class.
I am likely to continue utilizing tutoring.
I am likely to refer my friends for tutoring.
I have a better understanding of the course material.
My course grade has improved.
I am more confident now about doing well at UT than I was prior to attending tutoring.
I am a better student now than I was prior to attending tutoring.
Overall, tutoring has positively contributed to my academic success.

Additional Thoughts
After completing this portion of the survey, is there anything you would like to add about the impact of academic success from attending academic coaching, supplemental instruction, or tutoring?

Demographic Information

What is your class level?
First-year Freshman
First-year Transfer
Second Year Student
Third Year Student
Fourth Year Student

What is the highest level of education you ever expect to complete?

Some college but less than a bachelor's degree
Bachelor's degree
Master's degree
Doctoral or professional degree

What is the highest level of education completed by either of your parents (or those who raised you)?

Did not finish high school
High school diploma / G.E.D.
Attended college but not complete degree
Associate's degree
Bachelor's degree
Master's degree
Doctoral or professional degree

What is your gender identity?

Man
Woman
Another gender identity (please specify)
I prefer not to respond

What is your racial or ethnic identification (select all that apply)

American Indian or Alaska Native
Asian
Black or African American
Hispanic or Latino
Native Hawaiian or Other Pacific Islander
White
Other
I prefer not to respond

Which of the following best describes your sexual orientation?

Heterosexual
Gay
Lesbian
Bisexual
Another sexual orientation (please specify)
Questioning or unsure
I prefer not to respond

What is the distance of UT from your home town?

0 – 60 miles
61 – 120 miles
121 – 180 miles
181 – 240 miles
More than 240 miles