Learning and Study Skills in Students at a Small Liberal Arts College

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ABSTRACT

Despite a large body of literature on the various study skills that predict academic performance in college students, there is no consensus on which specific study skills contribute the most toward college success. Additionally, the emphasis in the literature is primarily on large public universities and specialized groups such as chiropractic, medical, pharmacy, and vocational students, with little to no research focused on small liberal arts institutions. Finally, studies in the field typically assess all students, and use a wide range of GPAs in examining differences between high- and low-performing students. It is important to see if differences in study strategies exist even when only a small subset of students are tested – many of whom are on probation for already low academic performances. The present study assessed ten different learning and study skills via the Learning and Study Skills Inventory (LASSI) in 41 students enrolled in a general studies class at a small liberal arts college. Academic achievement was assessed via cumulative GPA for each student. There were significant correlations between individual scores on the motivation subscale and GPA, and between utilizing academic resources and GPA. Both motivation and utilizing academic resources were found to also significantly predict GPA. Theoretical and practical implications of these findings are discussed, in the context of enhancing student success via early and proactive interventions.

1. Introduction

College students face unique sets of challenges that might be barriers to success. While most colleges have several systems in place to help struggling students, most of these interventions emerge after a student has already been identified as an "at-risk" student due to low grades. Additionally, there is a lack of clarity on the specific learning strategies and attitudes that predict college success (Alexander et al., 1998).

These learning strategies include "thoughts, behaviors, attitudes, motivation, and beliefs related to successful learning in higher education" (Weinstein & Palmer, 2002). Understanding the specific learning and study strategy needs of at-risk students might help identify barriers to learning, and proactively support their learning experiences. In other words, increasing student

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performance and retention might depend on effective evaluation of their cognitive and emotional processes, including motivation and other study strategies. The development of study skills and strategic learning is crucial for all students, especially those who may be at-risk, to succeed in college.

In the literature, learning strategies have typically been categorized into thoughts, practices, attitudes, and behaviors of students that predict academic success (Hattie & Donoghue, 2016; Nyikos & Oxford, 1993; Wild & Neef, 2023). For instance, academic motivation remains a topic of crucial focus because of its connections to academic excellence (Koenka, 2020). Likewise, academic help seeking appears to be a crucial component of academic success (Xie & Xie, 2019). However, an increasing number of undergraduates struggle to seek help effectively (Cheng et al., 2013), due to factors such as anxiety (Karabenick, 2003), motivation (Ryan & Pintrich, 1997) or low self-esteem (Ryan et al., 2001). Despite the wealth of information on the various learning skills and their role in predicting academic success, there is little to no literature on the relative contributions of these factors via a single standardized tool.

One of the measures to assess various learning and study skills is the Learning and Study Skills Inventory (LASSI) (Weinstein & Palmer, 2002). LASSI is an 80-item survey instrument to assess students' learning and study strategies across ten subscales: Information Processing, Selecting Main Ideas, Test Strategies, Attitude, Motivation, Anxiety, Concentration, Time Management, Self-Testing, and Study Aids. Participants answer each item on a 5-point Likert scale wherein 1 = not at all like me, 2 = not very much like me, 3 = somewhat like me, 4 = fairly much like me, and 5 = very much like me. The reliability of LASSI subscales is measured by Cronbach's alpha of 0.73–0.89 and demonstrates good validity (Fong, et al, 2021; Weinstein, Palmer, & Schulte, 1987).

LASSI has been used extensively since its early inception (Weinstein, 1987) with several studies reporting strong positive correlations between LASSI scores and academic performance (Cano, 2006; Marrs et al., 2009; Seabi, 2011). These trends are further confirmed by extensive meta-analyses (Credé & Phillips, 2011; Fong, Krou, et al., 2021) and systematic reviews of the literature (Credé & Kuncel, 2008; Xu et al., 2021). However, despite the large body of research on, and extensive use of LASSI, there is a gap in the literature in terms of the populations studied. Specifically, most of the literature focuses on large public universities (Prus et al., 1995), or on specialized populations such as chiropractic students (Schutz et al., 2011), medical students (Sleight & Mavis, 2006), pharmacy students (Lobb et al., 2006) or vocational students (Griffin et al., 2012).

The purpose of the present study was to examine the ability of LASSI to predict the academic success of college students, specifically among students enrolled in a general studies (GNST) class at a small liberal arts college. The research questions were as follows:

1. Do individual LASSI subscale measures correlate with cumulative GPA?
2. Do individual LASSI subscale measures predict academic success?

Academic success was defined by cumulative GPA calculated on a 4.0 scale, which is the average based on the accumulation of credits earned thus far in their academic journey. Courses transferred over from a different institution were not included in the GPA calculation. An important question is the extent to which different LASSI subscales correlate with and predict cumulative GPA in these students.

2. Materials and Methods

This study was conducted at a small liberal arts college in a General Studies (GNST) class. GNST is a two-credit elective course that focuses on developing academic skills, cultivating personal accountability, engaging in campus culture, and utilizing college resources to increase student success. The course is offered to all enrolled students. However, GNST instructors work closely with Admissions staff to identify first-year students that would benefit from this course. In addition, students who are placed on probation at the end of the semester (with a GPA less than 2.0) are required to take this course. The learning objectives within the course include the following: learning and applying effective study skills, increasing self-motivation by discovering and setting meaningful goals, maximizing learning by understanding learning preferences, learning about campus resources and normalizing help-seeking, and raising self-esteem by developing self-acceptance, self-confidence, and unconditional self-worth. Students will meet with their instructor, who is also a staff member within the student success center, twice weekly for the entire duration of the semester. In addition, students will meet with their instructor in two separate one-on-one sessions to get personalized feedback on their learning and study skills based on LASSI outcomes, and to receive support towards academic success. All students enrolled in the class had to complete all the LASSI components as part of the course requirement, however, only the students who provided consent were included in data analyses.

The ten subscales of LASSI (Weinstein, 1987; Weinstein & Palmer, 2002) are described below:

1. Anxiety (reverse scored – lower scores reflect higher anxiety): Assesses the degree to which students worry about school and their academic performance.
   Sample item: *Worrying about doing poorly interferes with my concentration on tests.*
2. Attitude: Assesses students' attitudes towards college and in achieving success.
   Sample item: *I feel confused and undecided as to what my educational goals should be.*
3. Concentration: Assesses students' ability to direct and maintain attention on academic tasks.
   Sample item: *I find that during lectures I think of other things and don't really listen to what is being said.*
4. Informational Processing: Assesses how well students can use imagery, verbal elaboration, organization strategies, and reasoning skills as learning strategies.
   Sample item: *I translate what I am studying into my own words*
5. Motivation: Assesses students' diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements.
   Sample item: *When work is difficult I either give up or study only the easy parts.*
6. Selecting Main Idea: Assesses students' skill at identifying important information for further study from among less important information and supporting details.
   Sample item: *Often when studying I seem to get lost in details and can't see the forest for the trees.*
7. Self Testing: Assesses students' ability to use specific techniques to determine their level of understanding of the information to be learned.
   Sample item: *To check my understanding of the material in a course, I make up possible test questions and try to answer them.*
8. Test Strategies: Assesses students' use of test preparation and test taking strategies. Success on tests relies on both preparation and test-taking strategies. Sample item: *I review my answers during essay tests to make sure I have made and supported my main points.*

9. Time Management: Assess the degree to which students manage time effectively. If they are able to create and stick to a schedule, deal with distractions, and cope with individual goals that may be competing for their time.
Sample item: *I set aside more time to study the subjects that are difficult for me.*
10. Using Academic Resources: Assesses students' willingness to use different academic resources such as writing centers, tutoring centers and learning or academic support centers, when they encounter problems with their coursework or performance.
Sample item: *I am not comfortable asking for help from instructors in my courses.*

2.1. Data Collection

The researchers went to the GNST class within the first week of the semester to introduce the study and offer the students the opportunity to opt out of their data being included in the research study. Each student completed the LASSI survey on their own device. Each student was immediately provided a copy of their results via the email address they provided.

2.2. Participants

The sample consisted of a total number of 41 undergraduate students enrolled in the GNST class in a small liberal arts college. The college has an enrollment of roughly 1200 undergraduate students, with approximately 40% being from underrepresented minorities. Within this study, participants were approximately 61% female, 36% male, and 2% nonbinary. Their ages ranged from 18 to 27 years with an average age of 19 years. The racial breakdown was: 51% White, 32% Black, 5% Hispanic, and 5% Multiracial. Collection of this data was approved by the Institutional Review Board.

3. Results

Data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) software (IBM Corporation, Armonk, NY, USA). The internal consistency results and descriptive statistics for all the LASSI subscales are presented in Table 1 below. These values are similar to those reported in the literature (Weinstein & Palmer, 2002). The mean score for each subscale represents percentile scores based on standardized national norms, with scores less than 50 indicating potential problems with that specific learning and study skill (Weinstein & Palmer, 2002). Notably, the average scores for each subscale in this study were in the bottom quartile, with the lowest scores on time management and anxiety.

Table 1.
Internal Consistency and Descriptive Statistics for LASSI Subscales

Subscale	Mean	Standard Deviation	Range		Coefficient Alpha
			Low	*High*	
Anxiety (ANX)	14.82	5.28	1	90	.80
Attitude (ATT)	21.11	4.64	1	90	.78
Concentration (CON)	15.57	4.99	1	85	.86
Information Processing (INP)	19.49	4.20	1	80	.73
Motivation (MOT)	21.02	4.43	1	90	.78
Selecting Main Idea (SMI)	17.74	4.04	1	90	.71
Self Testing (SFT)	15.91	3.97	1	80	.61
Test Strategies (TST)	17.40	4.17	1	90	.74
Time Management (TMT)	14.76	4.91	1	90	.82
Using Academic Resources	16.13	5.19	1	75	.81

Individual cumulative GPA scores ranged from 0.55 to 3.93 ($M = 2.21$, $SD = 1.08$). There were no significant differences in GPA between male ($M = 2.11$, $SD = 1.17$) and female students ($M = 2.22$, $SD = 1.04$) as revealed by independent samples t-tests, $t(38) = .39$, $p < .05$, with White students having a higher GPA ($M = 2.46$, $SD = 1.12$) than their Black peers ($M = 1.72$, $SD = .70$). Hispanic and multiracial students were excluded from this analysis due to there being only two of each. In terms of effects of gender and race on LASSI subscales, there were no significant differences between male and female students on any of the LASSI subscales, as revealed by Bonferroni corrected independent samples t-tests (all $ts < 2.02$, all $ps > .051$). Since there was only one student self-identified as being non-binary, they were excluded from this analysis. Similarly, there were no significant differences between the different ethnicities on any of the LASSI scales, as revealed by a one-way ANOVA, all Fs < 2.70, all $p > .08$. Thus, all the students were combined in subsequent analyses.

Correlational analyses were performed across all the LASSI subscales and individual GPA and are reported in Table 2 below. Overall, GPA was strongly correlated with two of the LASSI subscales: Motivation, $r(41) = .51$, $p < .001$, and Utilizing Academic Resources (UAR), $r(41) = .44$, $p < .01$, with higher levels of GPA correlating with higher levels of each of the two subscales. As a point of comparison, the correlations between SAT scores and college GPA are typically around $r = .35$ (Cohn et al., 2004). In other words, the correlations between motivation and GPA, and between UAR and GPA were greater than between the often-discussed associations between SAT scores and GPA. Appendix depicts a correlation matrix among all the LASSI subscales.

Table 2.
Correlations between each LASSI Subscale and Cumulative GPA

Subscale	Pearson Correlation	*p*
Anxiety (ANX)	.14	.37
Attitude (ATT)	.20	.21
Concentration (CON)	.07	.67
Information Processing (INP)	.06	.72
Motivation (MOT)	.51	<.001
Selecting Main Idea (SMI)	-.05	.76
Self Testing (SFT)	.13	.40
Test Strategies (TST)	.10	.54
Time Management (TMT)	.26	.10
Using Academic Resources (UAR)	.44	<.01

We also tested the extent to which motivation and UAR predicted GPA. Since no other LASSI subscales were significantly correlated with GPA, they were excluded from the regression

model. Tests of collinearity indicated that multicollinearity was not a concern with these data (Tolerance = .61, *VIF* = 1.65). The results of the regression indicated that these two predictors together significantly explained over a quarter of the variance (cumulative R^2 = .28) and the model was significant, $F(2,40) = 7.48$, $p < .01$. To further understand the nature of the different learning and study skills among students, they were divided into high GPA (top quartile) and low GPA (bottom quartile) groups. Descriptive statistics are presented in Table 3 below.
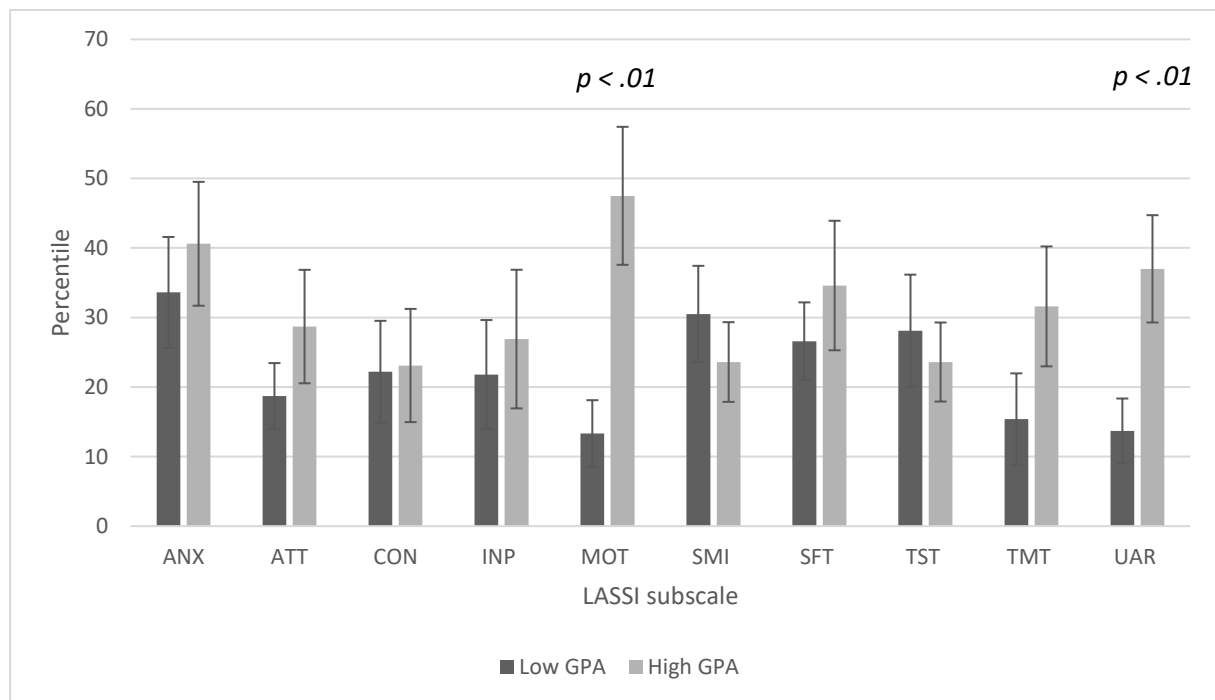
Table 3.
Descriptive Statistics for LASSI Subscales for Low GPA (bottom quartile) and High GPA (top quartile) Groups

Subscale	Low GPA (bottom quartile) n =10		High GPA (top quartile) n = 10	
	Mean	*SD*	*Mean*	*SD*
ANX	33.60	7.98	40.60	8.91
ATT	18.70	4.75	28.70	8.16
CON	22.20	7.32	23.10	8.14
INP	21.80	7.84	26.90	9.97
MOT	13.30	4.81	47.50	9.92
SMI	30.50	6.93	23.60	5.73
SFT	26.60	5.58	34.60	9.31
TST	28.10	8.07	23.60	5.68
TMT	15.40	6.57	31.60	8.62
UAR	13.70	4.65	37.00	7.72

Note. M and SD represent Mean and Standard Deviation respectively. All means indicate percentile scores on each LASSI subscale

Similar to the data from the correlational analyses, Bonferroni corrected t-tests revealed significant differences between low GPA students and high GPA students on the subscales of motivation, $t(18) = 3.10$, $p < .01$, $\eta^2 = 1.38$, and UAR, $t(18) = 2.59$, $p < .01$, $\eta^2 = 1.16$, as depicted in Figure 1 below. No differences emerged between low and high GPA groups on any of the other subscales.

Figure 1. LASSI Subscale Percentile Scores for Low GPA (bottom quartile) and High GPA (top quartile) Groups

To reiterate, these two subscales were correlated with individual GPA, revealed differences between high and low GPA students, and strongly predicted GPA. Furthermore, on average, students within this class scored in the bottom quartile across all measures – suggesting that they are the most at-risk for failure. Additionally, when students were grouped into high motivation (top quartile) and low motivation (bottom quartile) groups, they differed significantly on their GPAs, as revealed by Bonferroni corrected independent samples t-tests, $t(18) = 3.81$, $p < .001$, $\eta^2 = 1.70$. Similar differences were noted in the GPAs between the top and bottom quartiles of students based on the UAR subscale, $t(18) = 24.16$, $p < .001$, $\eta^2 = 10.80$.

4. Discussion

The present study utilized the Learning and Study Skills Inventory (LASSI) to assess measures of noncognitive study skills in students and assess their association with academic achievement. The novelty of this study is in the population choice, namely a subset of students who are enrolled in a general studies course at a small liberal arts college. The findings from this study support the results from the literature conducted on different populations that significant differences exist in LASSI subscales relative to the levels of academic performance. Specifically, this study reveals that motivation and UAR correlate with and predict individual GPA, and low and high GPA students significantly differ in both of these subscales. These findings replicate results from several prior studies done on different populations of students (Amrai et al., 2011; Khalil et al., 2020; Sleight & Mavis, 2006). The remainder of this section will discuss the variables of motivation and utilizing academic resources in terms of their role in academic achievement. Prior to discussing these two subscales, it is worth reiterating that this subset of students were struggling across all the subscales, scoring on average in the bottom quartile in each area. It is perhaps even more remarkable then, that even within this narrow subset of students, all of who were already struggling across the board on their learning and study strategies, there were further differences between the high and low GPA students across motivation and utilizing academic resources.

4.1. Motivation

Academic motivation has several components described in the literature. For instance, the Expectancy-Value Theory argues that motivation is driven by the individual's expectation of success and the perceived value of the goal (Achtziger & Gollwitzer, 2018; Trautwein et al., 2012). Likewise, the Self-Determination Theory defines motivation in terms of intrinsic and extrinsic sources of motivation (Ryan & Deci, 2017). Intrinsic motivation stems from genuine enjoyment and interest in academic tasks. Extrinsic motivation, on the other hand, is driven by learning for external rewards or pressures, rather than genuine interest. Within this context, students who struggle the most, and the ones who score particularly low on the subscale of motivation within LASSI, would be defined as being "amotivated" by this theory (Vallerand et al., 1992). Specifically, these might be students who see no clear reason to pursue school activities, whether intrinsic or extrinsic. A large body of literature points to the strong positive correlation between intrinsic motivation and academic achievement, and a simultaneous negative correlation between amotivation and academic achievement (Howard et al., 2020; Toste et al., 2020). Additionally, students with more positive self-concepts, that is, those who perceived themselves as being able to academically perform, have been shown to have higher rates of intrinsic motivation (Areepattamannil, 2012; Niehaus et al., 2012). Furthermore, theories point to the role of affect in having goals and working towards them, including positive emotions (enjoyment and interest) and negative emotions (boredom and anger), with the direction and nature of emotion predicting the motivation to complete the task (Pekrun et al., 2023).

In addition to the role of motivation in higher GPAs, intrinsic motivation has also been shown to promote deeper levels of processing (Vansteenkiste et al., 2006), higher classroom engagement and attendance (Crumpton & Gregory, 2011), more satisfaction with course work (Fortune et al., 2005), and greater persistence (Vallerand et al., 1992; Vallerand & Bissonnette, 1992). Meanwhile, extrinsic motivation can sometimes threaten an individual's intrinsic drive (Deci, 1976; Ryan & Deci, 2017) unless used to enhance the student's intrinsic motivation (Lepper et al., 2005). Specifically, a student who is driven by extrinsic motivation, such as earning high grades, might obtain higher grades, which then increases positive self-concepts, and eventually leads to higher intrinsic motivation to succeed (Niehaus et al., 2012).

The findings from the present study add to this existing body of literature and the association between motivation and academic achievement. Importantly, however, it highlights the need for academic advisors and student success teams to invest resources into building student motivation, as a means to increase engagement, retention, satisfaction, and eventually, academic achievement. A key pathway to facilitating motivation in college students is by formulating goals. A review of the literature suggests that creating goals can enhance intrinsic motivation (Harackiewicz & Elliot, 1993), especially if the goals align with the student's sense of self (Conti, 2000). Performing a task with a goal has been shown to enhance performance, both in laboratory settings (Locke & Latham, 1991), and in everyday life (Gollwitzer, 1999). Interestingly, merely imagining the process of pursuing a goal has been shown to facilitative achievement of the goal (Blankert & Hamstra, 2017), and thinking through the plan predicts college success (Cantor & Blanton, 1996), even in students with lower academic ability (Conti, 2000). In other words, well-thought-out and autonomous goals might predict academic achievement even more than just academic ability. Taken together, this body of literature points to the key role of goal setting and planning in driving academic success, presumably by changing the degree of intrinsic motivation in the student. Therefore, in terms of applying these findings to the present study, an important component of classes such as GNST in this study, might be to engage students in deliberate goal setting, ensuring that those goals align with the students' sense of self, and in formulating and imagining the plan to achieve the goal. Additionally, instructors in the first semester could incorporate personal goal setting into reflective essays, and class discussions could foster autonomous pursuit of these goals.

4.2. Utilizing Academic Resources

In addition to the differences in motivation between high and low GPA students, the present study found significant differences in terms of Utilizing Academic Resources, which in the literature is often referred to as academic help-seeking. Despite academic resources that colleges typically provide, college students typically do not tend to seek assistance from these support services (Alexitch, 2002). One of the models outlines the following steps in successful academic help-seeking: determining that there is a problem, determining whether help is required, determining if help is needed and from whom to seek help, actually asking for and receiving help, and processing the help received (Karabenick & Dembo, 2011; Karabenick & Knapp, 1988). Academic help-seeking has generally been linked with academic success in the college setting (Fong, Gonzales, et al., 2021; Karabenick & Dembo, 2011; Zimmerman, 2000) and in experimental research (Butler, 1998), although a subsequent meta-analysis reported nonsignificant associations between help-seeking and academic achievement (Credé & Phillips, 2011). One of the resulting theories is that the relationship between help-seeking and academic achievement might in fact be curvilinear, such that extremely low levels and excessive levels of help-seeking might both be linked with poorer academic outcomes (Karabenick & Knapp, 1988). There might be several factors which can influence students' decisions to seek help (Clevering et al., 2011), including personality traits (e.g. introversion)

and student attitudes towards help seeking (Ryan et al., 2001). Specifically, students who feel like help-seeking signals a lack of ability are less likely to seek help (Newman, 2000). Additionally, students who perceived help-seeking as being beneficial were more likely to seek help (Aleven et al., 2003). Finally, students from underrepresented backgrounds face additional barriers to help-seeking (Collier & Morgan, 2008). In particular, students who face the greatest stereotype threat might cause students to disengage from available campus resources (Massey & Owens, 2014; Payne et al., 2023). The present study replicated most of the findings in the literature, and found strong correlations between help-seeking (utilizing academic resources) and GPA. Therefore, a key implication for educational practice is to focus on normalizing and encouraging help-seeking among students by framing it as a beneficial practice instead of as a measure of inferiority and inadequacy. Additionally, academic advisors and campus services could proactively students from underrepresented groups, such as first-generation college students, and engage them in conversations about their attitudes and expectations about help-seeking to reduce self-stigma associated with academic help-seeking. Finally, increased awareness of academic support services and building a relevance to course material might make it easier for students to avail of these programs.

4.3. Limitations and Future Directions

It is important to consider some limitations within the study, and address how they can be addressed in future iterations. Due to the design of this study and the fact that it evaluated one subset of students within a small liberal arts college, the sample size was small. Further, while the study was conducted in general studies course, it is difficult to speculate on whether these trends will apply to a larger and broader student body. Due to the intriguing nature of these findings, a follow-up study is underway to test all incoming first year students at this school, which should help address both of these limitations. Additionally, data will be gathered on stereotype threat and stigma consciousness, in addition to more detailed data on marginalized statuses. Further, prior studies have pointed to the role of metacognition and self-awareness on improving learning and study skills. Specifically, merely being aware of potential areas of growth might increase student achievement. Towards that aim, future studies can assess the role of providing students with their LASSI scores and offering no additional interventions, to assess any changes in their academic outcomes. This study therefore, offers practical implications to pedagogical research and to educational practice, particularly in the context of small liberal arts colleges and for at-risk and marginalized students.

Acknowledgements

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Appendix

Correlation Matrix of LASSI Subscales

Variable	ATT	CON	INP	MOT	SMI	SFT	TST	TMT	UAR
ANX	-.01	.14	.36*	.17	.14	-.06	.36*	.17	.09
ATT		.68**	.33*	.64**	.48**	.31*	.42**	.37*	.38*
CON			.18	.60**	.55**	.30	.56**	.71**	.44**
INP				.31*	.38*	.28	.49**	.26	.23
MOT					.44**	.14	.56**	.46**	.63**
SMI						.01	.58**	.23	.14
SFT							-.01	.43**	.45**
TST								.36*	.38*
TMT									.48**

Note. * indicates p <.05, ** indicates p <.01