Using Learning Strategies to Improve the Academic Performance of University Students on Academic Probation

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One half of all students who begin college fail to complete their degrees, resulting in wasted talents, time, and resources. Through use of mixed methods, but primarily qualitative, comparative case studies, this research reveals ways a 3-week course in study strategies improved the performance of students placed on academic probation. The participating students, from a large, public university, reported benefits from the study skills course and studied for twice as many hours after participating in the intervention. A case study of 1 participant illustrates the ways students learned to use varied and effective study strategies. The findings provide empirical support for the use of diverse advising strategies, including direct, specific study-skills instruction for students struggling academically upon matriculation.

[doi:10.12930/NACADA-13-043]

KEY WORDS: academic probation, learning skills, learning skills courses, self-regulation, time management

According to a recent national report, students drop out of college due to lack of preparation for the rigors of academic work (Harvard University, 2011). Few researchers have examined the relationship between college students' self-regulation and learning strategies and their academic achievement. Not many have investigated the ways that college students acquire learning strategies and the reasons they choose to use them (or not) to improve their academic work. Because almost one half of all students who enter college fail to complete a degree in 4 years (Barefoot, 2007; Harvard University, 2011), additional research can add to the existent knowledge about ways students at risk for dropping out of college can benefit through learning study strategies. I used a qualitative study to investigate the direct teaching of study skills, including self-testing, self-regulation, and effective note taking, in a 3-week intervention for students at risk for attrition.

Review of Related Research

Little existing research illustrates the study strategies that work best with university students who either struggle academically or are placed on academic probation. A recent literature search revealed none that focused on the use of these strategies to increase academic achievement in students at risk for dropping out of college. However, according to a recent study, 56% of students who begin a bachelor's degree finish within 6 years, and 29% of those who work toward an associate's degree earn it within 3 years (Harvard University, 2011).

Furthermore, the United States was deemed the worst among the 18 Organisation for Economic Co-operation and Development countries in retaining students through graduation (Harvard University, 2011). The Pew Research Center Census analysis indicated that one third of the nation's 25- to 29-year olds have earned at least a bachelor's degree, a value that has been increasing during the last three decades, up from one fifth of young adults in the early 1970s who have attained the baccalaureate (Fry & Parker, 2012).

Current research demonstrates that a higher percentage of college dropouts come from low-income families. The Advisory Committee on Student Financial Assistance (2010) found that 41% of low-income students who had enrolled in a 4-year institution graduated within 5 years, a much lower percentage than students from all other groups who complete degrees within this period. This research also showed that 79% of students born into the top-income quartile in the United States obtain bachelor's degrees, and 11% of students from bottom-income quartile families graduate from 4-year universities. Research also demonstrates that 55% of earned bachelor's degrees were awarded to students from top-income quartile families with 2010 annual incomes above $98,000, and 9% of those degrees were earned by students with family income below $33,000. Enrollment rates for academically high-potential, but low-income, high school graduates in 4-year institutions fell from 54 to 40% between 1992 and 2004, while the enrollment of moderate-income students declined less precipitously from 59 to 53%.

In America each year, $400 billion is spent on postsecondary education (Harvard University, 2011) and as much as one half of those expenditures is

invested on students who fail to complete college. According to Complete College America (2012), 64.7% of low-income students enrolled in a 2-year college and 31.9% enrolled in a 4-year institution require remediation, undoubtedly contributing to increased rates of college attrition in this population. Weissmann (2012) eloquently articulated the problem:

> The system is incredibly wasteful. The students who show up but never graduate require administrative and academic resources. They take up precious classroom space, shutting other students out of the courses they need to graduate on time. They incur student debt, but don't get a credential, which weighs on their own finances. (p. 1)

Attrition and Retention of College Students

The American College Testing Program (2006) reported that average student retention rates from freshman to sophomore year for public 4-year colleges between 1983 and 2006 ranged from 66 to 70%, and private 4-year institution retention rates were between 70 and 75%. U.S. News & World Report (2011) data-based briefs from hundreds of postsecondary schools documented trends related to college retention and demonstrated that as many as one in three students fail to return to college after their freshman year. In his well-known classic book *Leaving College*, Tinto (1993) summarized the problem: "There is in fact, an increasing array of students, young and old, from a diversity of backgrounds who enter higher education unprepared to meet the academic demands of college life" (p. 49). Other contemporaries of Tinto added to the dialogue (see, e.g., Malloch & Michael, 1981; Mathiasen, 1984; Russell & Petrie, 1992) that continues today. For example, Weitzman (1982) found that many students who enrolled in college were unprepared for academic challenges because they failed to use study strategies. In addition, successful, persisting students have generally gained stronger academic preparation in high school (Russell & Petrie, 1992) and earned higher grade-point averages (GPAs) and standardized test scores (Malloch & Michael, 1981; Mathiasen, 1984) than those who drop out. Other factors associated with academic success include students' study skills and their attitudes about academics (Russell & Petrie, 1992).

College or University Learning Strategies Courses

Some research has been conducted on offering instruction on learning strategies to college students. For example, Tuckman and Kennedy (2011) compared the performance of first-semester freshmen in an online learning strategies course to a similar group of students who did not take the course (N = 351). Specific learning strategies presented in the class focused on taking reasonable risks, assuming responsibility, selecting the right environment, and the use of feedback. Tuckman and Kennedy found that the students in the online study-skills course reported higher GPAs entering their sophomore year than students who had not enrolled in the course, and more study-skill class students graduated than those in the control group.

Participation in learning strategies courses does not, of course, guarantee academic success. Dembo (2004) investigated common reasons that college students fail to benefit from learning skills courses (LSCs), such as their perceptions that they cannot make the necessary changes, their unwillingness to change, or their failure to learn how and what to change.

Learning Strategies Used by College Students

To recommend appropriate strategies, advisors must understand those that have worked well for the majority of students. The most common study method utilized by college students appears to be rereading content (Callender & McDaniel, 2009; Carrier, 2003; Goetz & Palmer, 1991; Karpicke, Butler, & Roediger, 2009; Stine-Morrow, Gagne, Morrow, & DeWall, 2004). For example, Carrier (2003) surveyed students in college classes about their use of test preparation techniques and found that 65% of upper-level students reported rereading as the most commonly used study strategy. Other researchers have also found success in using rereading as a study method (Amlund, Kardash, & Kulhavy, 1986; Barnett & Seefeldt, 1989; Howe & Singer, 1975; Krug, Davis, & Glover, 1990; Mayer, 1983).

However, some support a different tactic to studying. Consistent with a finding from Dunlosky and Rawson (2005), Callender and McDaniel (2009) found that rereading proved an ineffective preparation method for answering multiple-choice questions. They, along with Carrier (2003) and Karpicke et al. (2009), suggested that students benefit from studying when they actively process the content they are trying to remember.

Research has also been conducted on self-testing and self-regulation learning strategies. Self-testing, or the act of repeatedly recalling information, has been shown an effective way to study and recall information for assessments (Gates, 1917; Jones, 1923-1924; Spitzer, 1939; Tulving, 1967). Carrier and Prashler (1992) conducted a series of experiments on self-testing, finding that practice in retrieval results in better retention of information. Hartwig and Dunlosky (2012) surveyed 324 undergraduates and demonstrated that students' use of self-testing was positively associated with GPA. Despite the proven effectiveness of self-testing and retrieval strategies, Karpicke et al. (2009) found that the majority of college students do not use this method, preferring to simply reread their notes. They concluded that many students remain unaware that more active retrieval practices enhance the learning process and suggested that instructors inform students about the benefits of retrieval and self-testing.

Many college students have also learned to exert control over their time and schoolwork schedules (Pintrich & Garcia, 1993). Students who manage their study time and learning gain an advantage in higher education over students who have not developed these self-regulated learning strategies (Zimmerman, 1989). Self-regulation is considered critical for academic success. For example, Zimmerman and Martinez-Pons (1988) found that the use of self-regulated strategies was highly correlated with students' academic performance. Zimmerman (1989) identified several specific self-regulated learning strategies including

- self-evaluating: Students assess the quality of their work.
- organizing and transforming: Students manipulate content to improve learning.
- goal setting: Students set large and small related objectives and map out a process to achieve them.
- seeking information: Students find school-related information from academic sources rather than social resources.

Methods

Qualitative comparative case study methodology (Yin, 2009) was used to investigate the academic performance of students who had been placed on academic probation and were asked to voluntarily enroll in a LSC at a large (over 22,000 undergraduates), public research university. Merriam (2009), Miles and Huberman (1994), and Yin (2009) considered the comparative case study approach an appropriate methodology to make analytical generalizations about an area of inquiry. These case studies explore complex social phenomena: In this research, they describe the reasons capable high school students fail to achieve at a large public university at levels commensurate with their abilities. Interviews and discussions before, during, and after LSC sessions provided the context to explore attrition. Case study research can be generalized to theoretical propositions (Yin, 2009), and in this study it was used to offer the explanation for student underachievement in a university setting.

Instrument

The Acquisition and Use of Study Skills and Learning Strategies (AUSSLS) (Figure 1) was adapted from an instrument entitled the *Learning Strategies and Study Skills Survey* (LSSS) (Ruban, 1999; Ruban & Reis, 2006). The original LSSS included 58 items that were used "to describe whether patterns of use of self-regulated learning strategies vary among the different populations of university students" (Ruban, 1999, p. 15). To create the LSSS, Ruban (1999) drew from the 47-item *Study Skills Self Efficacy Scale* (SSSE) of Ramirez and Owen (1991) and from Zimmerman's (1989) publications on self-regulated learning. Alpha reliabilities for each of the 5 factors on the SSSE, which were incorporated in the LSSS and subsequently in the AUSSLS, ranged from .78 to .91 (Ruban, McCoach, McGuire, & Reis, 2003; Silver, Smith, & Greene, 2001).

According to previous research, α reliabilities on the 6 factors of the LSSS ranged from .70 to .92 (Ruban & Reis, 2006), and the 10 items adapted from the LSSS used in this study had α reliabilities of .80. On 5 of the items, participants were asked to check one or more options that applied to them. They attended to the other 5 open-response questions by provid-ing feedback about the featured statement. Each student completed the AUSSLS during the first 20 minutes of the first and the last class. Before or after a class period or during a mutually convenient time, I interviewed each participant about study strategies to further probe responses to the survey and better understand the students' use of the study strategies learned in class.

Figure 1. The acquisition and use of study skills and learning strategies survey

1. Have you developed any special way of studying in your current academic work (such as figuring out how to study difficult material more efficiently, finding a good way to memorize important information, etc.)?
   ○ I do it rarely ○ I do it sometimes ○ I do it most of the time ○ Can't think of any
   1a. Please list or describe the ways you study most often:
2. Why do you choose to use study strategies for your academic work? (You can check more than one):
   ○ To learn for meaning, not just to pass exams
   ○ To learn material more efficiently
   ○ To compensate for my learning difficulties
   ○ To get better grades
   ○ To organize material to help me better prepare for tests
   ○ To learn difficult content in some courses
   ○ Other (Please specify) _____
3. If you do not use study skills and learning strategies in your academic work, why do you choose not to use them? (You can check more than one):
   ○ I can succeed academically without them
   ○ It takes too much work to learn them
   ○ I never learned them
   ○ I don't have time to use them
   ○ Using them will not make a difference
   ○ Other (Please specify) _____
4. Will you continue to use the strategies you learned in the study strategies course as part of your routine? If yes, describe why and if no, describe why not.
5. How many hours per week, on average, did you spend on your academic assignments (e.g., homework, projects, etc.) BEFORE attending the study skills class?
   ○ 1-4 ○ 5-9 ○ 10-15
   ○ 16-19 ○ 20-24 ○ 25-29
   ○ 30 or more
6. How many hours per week, on average, did you spend on your academic assignments (e.g., homework, projects, etc.) AFTER attending the study skills class?
   ○ 1-4 ○ 5-9 ○ 10-15
   ○ 16-19 ○ 20-24 ○ 25-29
   ○ 30 or more
7. In your opinion, what study strategies have been the most useful to you during the study skills course?
8. Please describe how the use of study skills helps you to succeed in your academic work.
9. Describe the most useful study strategies you use to prepare for a challenging test.

Note. Figure adjusted for print; survey participants were given adequate space to respond.

Participants

The sample in this study was randomly selected from 116 undergraduates on academic probation at a large public, competitive, research university during the Spring 2012 semester. All of them had earned a 1290 or higher on their SAT exam. Those selected received an e-mail from their advisors inviting them to participate in the study. Of the 19 volunteers, 9 were randomly chosen to participate in the intervention group and thus enrolled in the LSC. Enrollments were purposely limited so I could interact with the students and effectively interview them.

At this university, students who receive a term GPA of 2.0 or below are routinely placed on academic probation and encouraged to meet with an academic advisor. If a student's term GPA falls below 2.0 for three consecutive semesters, he or she receives a letter explaining the imminent dismissal from the university for poor academic performance. Students on the dismissal list can appeal, under certain guidelines, in writing. The students in this study were in their second semester of probation.

Learning Skills Course Intervention

The LSC intervention met hourly twice a week for 3 weeks and was specifically structured to integrate explicit learning strategies with the students' academic work. The class could be

Table 1. Content from the learning skills course

Week & Class Meeting	Content
Week 1: Class 1	• Introduction to self-regulation ◦ Self-regulation theory ◦ Self-regulation strategies ◦ Positive implications of self-regulation
Week 1: Class 2	• Applying self-regulation strategies ◦ Goal setting ◦ Organization ◦ Time management
Week 2: Class 1	• Alternative ways to study for tests / assessments & effective note taking ◦ Self-testing ◦ Information retrieval schedule ◦ Notes as an effective study tool
Week 2: Class 2	• Applying new study and note-taking strategies ◦ Self-testing strategy use in various forms including outlines and note cards ◦ Class note-taking strategies ◦ Reading note-taking strategies
Week 3: Class 1	• Developing a personal study plan ◦ How to incorporate the strategies into studying for different classes ◦ Review of support services at the university to aid with studying
Week 3: Class 2	• Creating a specific study plan that will be submitted to Academic Support Services

taught or offered online by academic advisors, but all 9 participants enrolled in a classroom version attended by only those students on academic probation. The class content was developed from recommendations reported in the empirical literature by Hattie, Biggs, and Purdie (1996) and focused on four strategies. The instructor explained the rationale for using a specific learning strategy during the first class in each of the 3 weeks, and facilitated the implementation and practical procedures during the second class of the same week. The course content included in the LSC is summarized in Table 1.

Qualitative Coding

I developed comparative case studies of the 9 student participants to describe the findings (Miles & Huberman, 1994; Yin, 2009). I wrote an in-depth case for each student using thick descriptions as per Marshall and Rossman (1989). The subsequent analysis reveals a comprehensive view of the common characteristics of study patterns and learning strategies used by the LSC students participating in the study.

The qualitative coding paradigm enabled analyses of my observations of the class and interactions during personal interviews as well as participant answers to open-ended survey questions and the other questionnaire items. I completed data analysis (as per Strauss & Corbin, 1990) at three levels of coding: open, axial, and selective. Through open coding, I was able to formulate conceptual labels for the data collected. Using axial coding, I focused on linking subcategories of a set of relationships and their situational contexts for data validation. Selective coding informed my decisions about core categories that related to each other. The core categories that emerged related to students' lack of (a) preparation for the academic challenges of a competitive university environment and (b) study skills and understanding of ways to learn complex content.

The limitations of qualitative research were addressed using an approach suggested by Lincoln and Guba (1985), who proposed that four constructs solidify the trustworthiness of a study: credibility, transferability, dependability, and confirmability. To ensure that data reflect the situations of participants, I used persistent observation and triangulation (as per Lincoln & Guba, 1985). Persistent observation enabled me to establish credibility under a variety of conditions over six LSC meetings. The complete, comprehensive descriptions of the students and their experiences in the case studies improved the generalizability and transferability of the results.

Lincoln and Guba (1985) defined dependability as a means to consider factors of instability

and change. The examination of data collected from participants over six sessions allowed for the internal triangulation that helps determine the dependability of participant accounts and related events.

I also followed the suggestion of Lincoln and Guba (1985), who recommended an inquiry audit by a second researcher to examine both the research process and product. This second researcher also coded the data so we could compare the open and axial codes for agreement. Across 10 checks, we reached agreement in 80% of the codes assigned, suggesting strong interrater reliability.

To address researcher bias, I continually reflected on the daily class incidences and records using field notes and responses to interview questions. A search for unusual responses and alternative hypotheses as well as value-free note taking to record appropriate impressions during data collection also reduce bias and were used to enhance the trustworthiness of the study.

Findings

The qualitative findings of this study suggest that the study participants were unprepared for the rigors of postsecondary study. Those who struggled academically in this large, public university showed a distinct pattern of individual similarities and differences. Qualitative findings demonstrate that students were unready for completing basic tasks that predict success in their postsecondary lives, such as attending class regularly, communicating with their professors, completing required reading, and employing minimal study, self-regulation, and time management skills. The case study of Jamie illustrates some of the salient characteristics of a study participant who benefited from the LSC.

Case Study: Three New Strategies

Jamie, a White female, is finishing her third year at the university, majoring in liberal arts with a concentration in human development and family studies. With long, dark brown hair and brown eyes, she presents a vibrant, outgoing personality and smiles all the time.

Jamie comes from a small town and commutes from her parents' home each day to reduce the cost of college. She also works many weekend hours at her part-time job in her hometown.

Very close to her parents, Jamie frequently keeps in contact with them throughout the day using e-mails or text messages. She thinks that her parents overprotect her; for example, during a recent incident of inclement weather, Jamie's parents called her at the university to insist she return home immediately.

Jamie talked frequently in each of the LSC sessions and seemed very comfortable sharing her academic experiences with classmates. She often volunteered to answer questions when no one else wanted to talk, and she candidly revealed the reasons for her academic difficulties. Her classes were significantly harder than she had expected them to be, and she admitted to not studying sufficiently to achieve good grades in any of them. Jamie explained that as the content grew increasingly difficult, she "withdrew," studied less, disengaged in class, and extended little to no effort into assignments. In retrospect, Jamie believed she had been protecting herself because once she became confused in class she believed she had very little chance for academic success and should therefore not begin to make friends at the university.

She also decided that she could cope with a poor outcome if she did not try at all and received a bad grade instead of trying and subsequently failing. Jamie explained that she withdrew because she did not know how to study the complex information she encountered. She explained that her high school classes had been very easy to master and she never had to read the textbooks or study for more than 45 minutes for an exam. The ease of those classes led Jamie to develop habits that negatively affected her studying, such as reading in front of the television and waiting until the last minute to begin studying or complete an assignment. In her interviews, Jamie expressed eagerness to learn new strategies that would assist her in academics: She wanted to add "more tools to her learning toolbox."

Jamie indicated a strong interest in using three strategies discussed in the class: self-regulation, rewriting notes, and making note cards. Although many in the LSC did not understand the importance or relevance of affective self-regulation to their academic experience, Jamie carefully considered the concepts along with self-regulation theory, in general, and began integrating some simple strategies into her daily academic routine. Specifically, she applied the strategy to her defeatist attitude toward challenging or difficult content in her classes and started praising herself for small successes. For example, in her sign language class, she would commend herself for learning two new signs rather than mentally degrade herself for not memorizing the entire paragraph of signs.

Jamie said this cognitive shift proved difficult and remained a work in progress during the entire

3 weeks of the course, but she ceased comparing herself with other students most of the time. She began focusing on feeling confident about working to the best of her ability and remaining encouraged about her work and effort. Jamie explained that this new approach and attitude toward academics helped her tackle more difficult content rather than withdraw when she encountered it. She told the class that she wanted to maintain "the positive vibes" that she had developed using self-regulation of affect because she had become more confident in her ability to succeed with a more positive outlook and attitude.

Jamie also started rewriting her notes, a strategy she learned in class to better organize and review information. She usually carries her laptop computer with her to class and takes notes in a software document. Jamie likes using the laptop because she types faster than she can write her notes. She also downloads the professors' presentations and takes notes while following along during class. However, although note taking works well for her, she admitted to getting off task easily because she frequently accesses the Internet and checks her e-mail and Facebook during class.

All students were asked to try rewriting notes for one of their classes and report back on the effectiveness of the strategy. Jamie explained that rewriting helped her remember more details from her class than she had in the past. She found this outcome interesting: Although she always kept detailed recorded notes in class, she realized that she rarely examined them unless an exam was scheduled. She also explained that rewriting her notes allowed her to organize them in a manner that made sense to her, which helped her to remember the content more easily. The LSC instructor asked Jamie if she believed that this strategy was sustainable for her, and she thoughtfully responded: It had helped her, but involved a great deal of time every night after class, so she expressed uncertainty about continuing the rewrites. The instructor challenged Jamie to make modifications to make it more practicable for her academic future. At the next class, Jamie approached the instructor and explained that she had figured out a "really great" system that involved making outlines of the most important information for each class every week. Jamie believed that this personalized strategy incorporated the rewriting aspect she had learned in class, which she found very helpful, yet relieved her of the overwhelming commitment she had initially made to rewriting.

For the final strategy, Jamie reported implementing note cards in her study. Jamie described her primary mode of preparing for tests in high school, which had been regular rereading of the class material, and she had received Bs on important exams. Once in college, Jamie never considered adding or changing the strategies that had contributed to her desired high school grades. Instead of seeking new strategies when confronted with difficult college-level material, she reread for longer periods than she had done in high school believing she could improve her college exam grades by simply spending more time with the old tactic. In the LSC, Jamie learned ways to break up or chunk content to put important material on a note card. After practicing this technique multiple times in class, she created 10 to 20 note cards as homework.

When asked to report on the success of the exercise, Jamie explained to the class that making note cards produced a similar positive effect as the rewriting strategy. When she created note cards, Jamie could make herself reconceptualize content, which deepened her understanding of it. In addition, reviewing the note cards multiple times each day aloud aided with memorization of the material. Jamie believed that note cards offered the most useful test preparation tool she had learned, and she intended to use it to prepare for all of her exams.

Jamie ended the fall semester, after completing the LSC, with a term GPA of 2.44, an increase from the 1.42 she had earned the previous semester. Jamie's fall-term GPA placed her in good academic standing, and she was no longer subject to probation or dismissal for academic reasons from the university. Seven of the 9 participants, including Jamie, increased their GPAs from Spring 2012 to Fall 2012 as summarized in Table 2.

Survey and Interview Results

On 5 of the 10 AUSSLS items, participants checked one or more options that applied to them and provided responses to the remaining 5 open-response questions. The interviews were conducted to probe responses to all items on the questionnaire, but particular attention was directed to the open-response questions.

Study Strategies Used. In response to the first question on the instrument, the 9 participating students identified the specific ways that they studied before they participated in the LSC intervention and checked a box indicating the

Table 2. Participant GPAs after taking the learning skills course (4.00 point scale)

Student Pseudonym	Spring 2012 GPA	Fall 2012 GPA
Tamara	.43	1.16
Nate	.60	1.49
John	.87	.21
Savannah	1.15	1.23
Jamie	1.42	2.44
Edward	1.69	2.46
Paul	1.89	2.79
Jimmy	2.14	1.55
Jay	2.20	2.83

frequency with which they had used the identified study skills. Two students indicated they could not think of any study skills used, two other students reported rarely using study skills, another used them sometimes, and the remaining four responded that they used study skills most of the time.

On the first administration of the survey, 4 of the 9 respondents listed some form of rereading plan as their primary mode of studying; their re-reading strategies were applied either to their notes or their textbooks. Two students listed active engagement strategies, such as retyping their notes and creating note cards; for example, Paul wrote on the survey, "I have discovered that retyping my notes for one of my classes has been very helpful." Another student, Savannah, noted that self-regulation and time management techniques proved useful to her when studying: "It is easier for me to break large projects/homework assignments into smaller pieces and space them out over a longer period of time. This prevents me from becoming overwhelmed and stressed out."

At the beginning of the LSC, two students indicated in interviews that they simply did not know how to study or gave a cursory or vague description of their study strategies for class; for example, Jamie explained that she did a "last minute overview," but did not elaborate on the specifics of those few minutes. John seemed quite honest in his response on the survey: "I don't really know how to effectively study since I never had to before college. I used to look at/do things and automatically know them." In summary, diverse responses reflect a range of study strategies from active engagement activities, such as retyping notes, to no discernible study strategy.

After 3 weeks of participating in the LSC for 2 hours each week, the survey responses for the questions about student strategies showed positive trends over the disparate findings from the pre-intervention results. When asked during interviews whether students had developed any specific ways of studying, 8 of the 9 participating students indicated that they practiced using study methods most of the time, with one student saying that he only used study strategies sometimes. This finding suggests that the LSC inspired more regular use of study strategies than the participants had utilized before taking the class.

Students also explained on the survey that they used a broader variety of strategies after taking the LSC, including active engagement with the content they were studying. Three students indicated that they used note cards or some form of self-testing, while 4 students reported rewriting their notes as a preferred study method. Five students said that they used two or more strategies. Edward, for example, reported that he used rereading and rewriting strategies; Jimmy undertook outlining and repetition most often; Paul employed the use of self-testing and re-typing notes; Savannah relied on using online note cards, rewriting, and concept mapping.

The post-intervention responses for question No. 1 on the survey suggest two outcomes. Students used more and differing study strategies after the intervention than they had utilized before taking the class, and more of the students incorporated study strategies that involve active engagement with the content after they had participated in the intervention.

Time Studying. In response to Items 5 and 6 on the questionnaire, students indicated the number of hours each week they spent studying before and after the intervention (respectively). Table 3 summarizes these self-reported data. Prior to taking the class, 4 students reported studying the fewest possible hours, but after the class none selected this category.

No students studied between 20 to 24 or 25 to 29 hours per week prior to the intervention, but after participating in the LSC more than one half (5 of 9) reported studying between 20 and 29 hours. The mean number of hours of study was determined using interval data. Before the intervention, the mean number of hours studied was 8.0, and after the intervention, it was 19.4. In summary, all 9 participants reported that the hours each week they studied increased after they participated in the intervention.

Useful Study Strategies. Survey Item 7 asked respondents to identify study strategies most useful

Table 3. Hours spent studying as reported by students pre- and post-intervention

Student Pseudonym	Hours Studying	
	Pre-intervention	Post-intervention
Edward	1 to 4	5 to 9
John	1 to 4	10 to 15
Tamara	1 to 4	10 to 15
Nate	5 to 9	16 to 19
Jamie	1 to 4	20 to 24
Jay	10 to 15	20 to 24
Jimmy	10 to 15	25 to 29
Paul	10 to 15	25 to 29
Savannah	16 to 19	25 to 29

to them. After taking the LSC, 5 students thought the use of note cards and self-testing most beneficial, information quite different from the data gathered at the beginning of the intervention when one student reported using note cards for studying. The reported increase in the use of this skill may reflect the way the instructor presented the information or the improvements students documented following employment of this strategy. Advisors may want to suggest note cards or self-testing to students encountering academic difficulties.

Other Study-Related Behaviors. According to the interviews and open-ended survey questions, students who encounter challenges are unprepared for academic rigor and either do not know or have chosen not to employ basic study strategies regularly used by students in good academic standing. Most of the participants lacked a sense of accountability for their own studying and academic progress. Several reported that without parental monitoring, they simply did not study enough, spend adequate time on their work for class, or complete minimal tasks needed to persist in college. They admitted to not regularly reading official university e-mails, attending class, and keeping appointments; that is, they failed to complete academic obligations. Several of the participants said that they had regularly missed appointments with academic advisors. These findings, taken with the survey results, lead to several implications and opportunities for academic advisors.

Discussion

The Effectiveness of Learning Skills Courses

In this study, students on academic probation who enrolled in the LSC reported an increase in the hours they studied after the intervention, a result that comports with the findings of Tuckman and Kennedy (2011). According to the completed AUSSLS survey, two participants reported little change in their study habits after taking the LSC. Dembo (2004) investigated common reasons that college students fail to benefit from LSCs, including students' perceptions that they cannot make the necessary behavior modifications or their unwillingness to change. In this study, some participants believed that they could not make the necessary changes because the strategies were too difficult or took too much time. They often dismissed the use of learning strategies, ignoring the possibility that the LSC offered information on new ways to study or learn.

Traditional Study Skills

According to the survey responses, the most commonly used study method used by participants on academic probation at this university involved simply rereading content. This strategy was also identified in previous research (Callender & McDaniel, 2009; Carrier, 2003; Goetz & Palmer, 1991; Karpicke et al., 2009; Stine-Morrow et al., 2004). After completing the LSC, all participants in this study reported the use of rereading as one of the study methods used most often to prepare for exams, with 5 of 9 indicated it made up their primary method for test preparation. Of these 5 students, 2 reported that rereading had been a successful form of studying for them.

Strategies Offered in the Learning Skills Course

Twentieth-century researchers investigated self-testing and most concluded it makes up an effective way to study and recall information for assessments (Gates, 1917; Jones, 1923-1924; Spitzer, 1939; Tulving, 1967). The LSC in this study emphasized self-testing and setting an information retrieval schedule. Participants were initially receptive to self-testing, and in general, acknowledged that this tactic helped them when correctly applied to study, but many did not want to commit to using self-testing after the intervention was completed. Only four students in the LSC indicated they would continue to use it in the future.

Many college students exert control over their own time management and course work schedules as well as the methods by which they study and

learn (Pintrich & deGroot, 1990). Students who manage their time and learning achieve higher grades than students with underdeveloped self-regulated learning strategies (Zimmerman, 1989).

Time management proved one of the most successful strategies introduced in this study. Participants reported that they liked the structure and limits of the time management strategies suggested, and most reported comfort applying them because the self-imposed schedules resembled those in primary and secondary school. This point raises several questions about whether the use of study skill classes in high school or introduced the summer before college enrollment could help prepare or teach incoming students to develop proficient time-management skills.

Implications

Several implications emerged from this study for academic advisors. The participants benefited from the study strategies learned in the intervention, and therefore, academic advisors could initiate conversations about the types of study strategies students are using, the number of hours per week they devote to studying, and the ways they use self-regulation strategies such as choosing study locations and addressing distractions they face. To initiate this conversation, academic advisors could consider using items included in Figure 1 from the AUSSLS.

In this study, 8 of the 9 participating students practiced using study methods after taking the LSC and more than one half of the students began using active engagement strategies, such as retyping their notes and creating note cards. This finding suggests that students benefited from the strategies discussed in the LSC and the topics could be integrated into individual or small group advising sessions. The direct teaching of some of these study skills by academic advisors could also potentially increase the use of them across a broad population of students, not solely those deemed at risk of attrition or those with probationary status. Also, enterprising advisors could create an online course for use with on- and off-campus students who struggle academically.

Regardless of their own work environments and practice (e.g., professional in face-to-face conferences, group facilitator, faculty member with major caseload, or online advisor for distance learners), advisors can create courses or teach study strategies to individuals or small groups of students. Items featured in the AUSSLS can be used to identify students who may benefit from these types of instructional activities.

Educating students on learning skills only solves part of the problem for students at risk for dropping out of college. According to this study, students need time to learn and effectively practice the strategies in their classes. Advisors can and should be the persons who discuss the application and utility of these study skills as well as encourage students to persist in employing the newly learned tactics. They often are better positioned than others on campus to identify a problem and follow up over a period of weeks or even months.

Perhaps the most important finding in this study showed the hours of weekly studying reported before and after the intervention. Before taking the LSC, students reported studying for 8.0 hours per week and after the class their time spent studying more than doubled to 19.4 hours per week. In addition to asking about study time, advisors can provide regular monitoring and questioning about other aspects of time management. Specifically, they could suggest students keep track of their study habits and time dedicated to studying as a way to work with advisors on planning and improving their time management.

The importance of LSCs for students who continue to encounter academic difficulty after some initial contact and preliminary help emerged as another implication of this study. For students who need intensive assistance to achieve academic persistence, a face-to-face class scheduled over a semester coupled with individual periodic meetings with advisors may prove most beneficial.

Limitations

This research presents several limitations, including those related to data collection procedures. According to Isaac and Michael (1997), surveys depend on the direct communication with persons selected for a study, which limits the applicability and generalizability of the results. After numerous information sessions and a proactive recruitment process (N = 116), 19 students agreed to participate in the study, which may not reflect a representative sample of persons on academic probation. However, qualitative research provides rich descriptions of phenomena or individuals, and generalizablity is typically not an intended outcome.

Although empirical support exists to justify a 3-week intervention (Bishop & Brenneman, 1986; Hattie et al., 1996), the time period may not be

enough to generate meaningful change. Therefore, advisors should know all the resources available to help students at risk for attrition.

Summary

The findings of this study suggest that some students enter higher education unprepared for the rigors of postsecondary study. The qualitative findings strongly suggest that study participants placed on academic probation did not know how to study or undertake basic academics-related tasks, such as attending class regularly, communicating with their professors, and completing required reading. Furthermore, they used minimal study, self-regulation, and time management skills. Findings also highlight the negative impact of high school and family experiences that fail to prepare students to succeed independently in college.

The participants in this study had been successful in high school. However, some not only lacked the study, time management, and other skills necessary to negotiate academic challenges, they also lacked the motivation or skills to find help when they floundered academically.

Without the accountability required through the class assignments, participants may not have learned or implemented the new study strategies offered in the LSC. The findings of this study suggest that college or university students on academic probation can benefit from LSC instruction delivered in person. However, other means of delivery may also prove useful, such as a hybrid online approach. Furthermore, academic advisors can supply appropriate follow-up for student accountability and encouragement through the caring relationships that characterize their roles as educators and advocates.

Future research should examine the complex patterns of low performance in college students and ways academic advisors can develop a framework to address poor study skills, either by LSCs or with individual interventions. These efforts could provide a foundation for designing effective differentiated efforts aimed at enhancing learning as well as increasing motivational and learning strategies used by college students.

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This study received institutional review board approval from the University of Connecticut via IRB Protocol #H12-253.

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