STUDY STRATEGIES AND MOTIVES: UTILIZATION OF AN ASSESSMENT TOOL FOR AN INDIVIDUALIZED ADVISING PROGRAM

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ABSTRACT

STUDY STRATEGIES AND MOTIVES: UTILIZATION OF ASSESSMENT TOOL FOR AN INDIVIDUALIZED ADVISING PROGRAM

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Though much of the research has evaluated the constructs that contribute to academic success, there has been minimal practical application of this useful information. The current research aimed to utilize an assessment tool that would support struggling student by identifying their strengths and weaknesses in both study strategies and motives. The current research used the Study Process Questionnaire (SPQ) and converted it to a multidimensional scale. By converting the SPQ into a multidimensional scale participants were identified as *student* types based on survey responses. These category placements indicated why students might be struggling academically. This study suggests a need for academic advising that targets these strengths and weaknesses of individual students. The conversion of this questionnaire scores allows academic advisors to use this information to specifically target remediation.

CHAPTER I – INTRODUCTION

Admission criteria at universities are designed to select students for matriculation who have a good chance at competing and succeeding within that school. However research pertaining to graduation rates has suggested a decline in the number of students obtaining degrees among four-year colleges (Brainard & Fuller, 2010) thus demonstrating that admissions criteria alone cannot ensure degree obtainment.

Students enrolled in colleges and universities are thought to have ambition to acquire knowledge. They should understand how to best succeed academically based on their current level of education. Contrary to this assumption, research has shown that students do not have the necessary skills to excel in higher education and that they may lack the motivation to pursue high academic standards. Research in the areas of domains of learning, motivation to learn, and study strategies have demonstrated this finding (Karpicke, Butler & Roediger, 2009; Chew, 2010).

Motivation

Student motivation is a multifactorial, complex construct contributing to academic achievement. One factor that influences student motivation is goal orientation. Much of the research has agreed that goals can be separated into two categories of learning goals (sometimes referred to as mastery goals) and performance goals. According to Grant and Dweck (2003) a learning goal refers to when an individual attempts to increase their competence, to understand information, or master something new. When a student utilizes the learning goal model, he or she attempts to relate the new information to existing knowledge and attribute personal meaning and understanding to the new information.

In contrast to a learning goal, other students orient towards performance goals. The objective of a performance goal is to demonstrate one's ability or avoid demonstrating the lack of ability when completing an academic task (Linnenbrink & Pintrich, 2002). An example of a performance goal is a student who does only enough work to pass a test, without the desire to actually understand the material. Some studies suggest that goal orientation can affect performance and success in academic settings (Eppler & Harju, 1997; Taing, Smith, Singla, Johnson, & Chang, 2013). Research by Jourdan (2010) revealed a significant relationship between learning goals and academic performance. In contrast, Jourdan's (2010) research did not demonstrate the same relationship with performance goals. These findings indicate that students who adopt learning goals, as opposed to performance goals, will increase the likelihood of academic success because of the relationship between goal orientation and motivation.

Another construct that impacts motivation is self-efficacy. Self-efficacy is an individual's belief in their ability to perform a task (Mega, Ronconi, & De Beni, 2014). A student will be more motivated to pursue a task if they believe they are capable of completing it. Studies have revealed that changing one's self-efficacy can change their approach to academic studies (Siegle & McCoach, 2007). In addition, research has found significant positive relationships between individuals with high levels of self-efficacy and self-regulation (a component of study strategies), as well as high self-efficacy and intrinsic motivation (Radovan, 2011). This being the case, it can be implied that an increase in self-efficacy will promote academic success because of its influential relationship to motivation. Motivation, a crucial factor to student success, is not the only factor that will impact academic achievement.

Study Strategies

Since the 1970's researchers have been investigating how people learn and obtain new information; however, the recent trend in higher education graduation rates has brought this research to the forefront (Entwistle & McCune, 2004). This research suggests that students' learning strategies may be ineffective because students are not sufficiently taught the necessary skills to help them thrive academically prior to matriculation into higher education institutions. According to the academic reports by the National Assessment of Educational Progress (NAEP), the majority of middle and high school students are ill prepared for college (Radcliffe, & Bos 2013). In addition, institutions appear unable to address these skill deficits once the students are enrolled in college (Tinto, 2014). Research has aimed to identify students' study skills and to gain insight into the learning process. It has been shown, that the implementation of appropriate study strategies will lead to effective learning (Kornell, 2009). As stated earlier, self–regulatory behavior, is a component of study strategies, and one of the skills required to be successful academically.

Self-regulated learners are aware of task requirements in addition to their own learning needs. Self-regulated learners monitor and evaluate their own academic progress by goal setting, maintaining motivation, and utilizing appropriate learning strategies (Ramdass & Zimmerman, 2011). Students who are struggling academically are usually not good self-regulators. Often times struggling students do not employ appropriate study strategies and they inaccurately monitor their learning progress. For example, Dunning, Heath, & Suls (2004) demonstrated that when students were asked to evaluate their own academic performance they overestimate their scores on examinations.

As well as monitoring the learning process, research has also determined the selection of strategies to be important. Dobson and Linderholm (2015) conducted research evaluating self-testing study strategies and retention of information. Subjects in this study employed three different study strategy techniques while reading assigned passages. The first technique required subjects to read the passage three consecutive times. The second technique required subjects to read the passage and then re-read the passage while taking notes. And for the final technique subjects had to read the passage, recall as much information as possible (aka self-test) and then read the passage again. Results from this study showed that the self-testing procedures resulted in superior retention of passage related information compared to the other study techniques. Results from this study suggest that self-regulated learners, by utilizing good strategies like self-testing, will be more aware of the information that they have not mastered. If students develop these self-regulated behaviors, then they can more accurately monitor their learning needs and progress and will likely increase their academic success.

Another construct that plays a significant role in self-regulation and relates to learning strategies is metacognition. Originally referred to as metamemory (Kreutzer, Leonard, & Flavell, 1975) metacognition is self-awareness of how one learns and thinks (Schleifer & Dull, 2009). Often students have misconceptions about how effective learning occurs and oftentimes they inaccurately judge when something has been learned (Karpicke, Butler, & Roediger, 2009). Students who have these misconceptions are said to have poor metacognition. Research by Amzil & Stine-Morrow (2013) evaluated metacognition and its relationship to academic achievement in college students. Findings from this research indicated that students who had high achievement were more aware of metacognitive knowledge than low achieving students. In addition there was a strong correlation between metacognition and GPA. Consistent with

previous research, the conclusions of the study, by Amzil and Stine-Marrow (2013), stated that because metacognition is highly correlated with academic success, metacognition is a strong predictor of success among college students. This suggests that if students can improve their metacognitive knowledge they will likely see a rise in positive academic outcomes. Students with poor metacognition often have misconceptions about the learning process which in turn impacts the study strategies they employ. If students could be taught alternate, more effective learning strategies which correct learning misconceptions, this could have positive outcomes for their academic performance.

Altering Students' Motives and Strategies

In a study conducted by Sancho-Vinuesa, Escudero-Viladoms, & Masià, (2013) a new teaching strategy was applied to a mathematics course which aimed to improve student motivation. The application of the new teaching strategy lead to higher academic outcomes. Instead of a traditional classroom protocol where a teacher lectures to students, the students were required to engage in continuous practice activities and weekly assignments. The assignments were followed by immediate feedback. This active learning process allowed students to monitor their progress and helped students become engaged in course material. In follow up interviews students revealed a relationship with immediate feedback and motivation. Students expressed that the immediate feedback influenced feelings of success and students felt encouraged to do well and complete the course. When this particular course was compared to previous semesters, there was a significant decrease in the number of students dropping out of the course (Sancho-Vinuesa, Escudero-Viladoms, & Masià, 2013). This research illustrates how the implementation of a learning strategy targeted at intrinsic factors such as motivation, can improve academic success.

The success of these studies demonstrates the need to further investigate motivation and learning strategies and how to impact academic performance. In attempt to help students who have inadequate performance, colleges and universities have created academic advising programs, learning communities, tutoring programs, remedial courses, summer bridge programs, etc. (Bettinger, Boatman, & Long, 2013). Research pertaining to these intervention programs, has shown that participation in the programs has resulted in an increase in student retention (Earl, 1987; Rodgers, Blunt, & Trible, 2014; Zhang, Fei, Quddus, & Davis, 2014). However, despite the development and implementation of these programs, high dropout rates among university students continue to be a problem. Therefore researchers have started evaluating components of intervention programs. Most relevant to the current research is academic advising programs, which can be modified in order to help students learn and maximize student retention (Paul & Fitzpatrick, 2015).

The Link to Academic Advising

Many surveys have been administered to assess student perceptions and attitudes towards academic advising (Christian & Sprinkle, 2013; Davis & Cooper, 2001; Ellis, 2014; Teasley & Buchanan, 2013). In addition, research has investigated the relationship between meetings with academic advisors and student retention. It has been shown that the number of advisor meetings serve as a significant predictor of student retention (Swecker, Fifolt, & Searby, 2013). While this collective information is useful in discovering how to maximize the utilization of academic advising programs, it lacks a practical application of the information. That is, simply meeting with an advisor is unlikely the reason for student success. What the advisor says or information the advisor presents is more likely the key. Although most academic advisors receive some training, they may be ill equipped to help students excel because there is no established protocol

to identify why students struggle academically. If the reason for academic struggle cannot be identified, then it cannot be remediated. The existing research does not describe a method to identify areas of low motivation or deficits in the learning strategies for individual students who are seeking help. In order to help students improve, it is crucial to first identify the particular reason that the student struggles academically.

Much of the literature suggests that students fail to obtain degrees because they are ill prepared for academic work. Bjork, Dunlosky, & Kornell (2013) point out that institutions are often concerned with student competencies pertaining to domains such as English or mathematics, but students are rarely tested to see if they have the necessary learning skills and practices needed to excel in higher education. According to Renzulli (2015) little work has been done to investigate the ways that college students acquire learning and study strategies and the reasons students use, or do not use, these strategies to achieve academic success. In addition, Renzulli (2015) suggests that more research needs to be conducted to evaluate the patterns of low performance in college students to determine alternative ways of helping students address poor study skills through learning skills courses or individual interventions. The current study aimed to address this proposition by suggesting a method for helping students by addressing their individual needs in regards to study strategies and motivation.

In order to identify why someone is struggling, some form of diagnostic instrument might be used to pinpoint the particular reason. The present study proposed the implementation of an assessment tool that identifies personal shortcomings related to study strategies and motivation to learn. Once a student's' area of deficit is identified, a plan to address these deficits can be created. If successful, this tool can be utilized by current academic advising programs. Academic advisors could use the knowledge gained to develop a more individualized plan for

correction. Theoretically, helping students with a plan to remedy their area of weakness with appropriate techniques will help them excel academically.

Although many instruments have been developed to assess constructs of study strategies and motivations, the Study Process Questionnaire (SPQ) has been utilized in numerous studies and has proven to be both valid and reliable and was therefore selected for this research (Biggs, 1988; Biggs, Kember, & Leung, 2001; Fox, McManus, & Winder, 2001). The SPQ was originally created for teachers to evaluate the learning approaches of their students. The instrument assesses surface and deep motives for learning and surface and deep study strategies for learning (Biggs et al., 2001). Research has shown that poor academic success among students may be attributed to a lack of skill and a lack of motivation, but what the research lacks at this point is individual identification of these shortfalls and practical application of this information to improve student weaknesses.

In order to actually utilize the data from this instrument to support student learning it is essential to find a more efficacious way to report the results. To achieve this goal, the current study converted the SPQ to a multidimensional scale which allowed for the presentation of data visibly in a four quadrant format. Previous research conducted by Socha & Sigler (2012) has demonstrated that the LPQ, which is an instrument similar to the SPQ, will function on a multidimensional scale which indicated that this was also appropriate for the SPQ. By converting the information to the quadrant format students were identified as "types" based on their individual responses to the questionnaire. The information from the multidimensional scale will allow students to be counseled to their specific learning needs based on their quadrant placement.

In this study the four quadrants are deep motives (DM) and deep strategy (DS); deep motive (DM) and surface strategy (SS); surface motive (SM) and deep strategy (DS); and surface motive (SM) and surface strategy (SS). Helping someone with DM and SS would differ greatly from helping someone with SM and DS. For example, a DM and SS student may be motivated to attend all classes and study for 12 hours for an exam but still fail the test because they lack appropriate strategies. On the other hand, a student with SM and DS may have the strategies to understand the material, but struggle with motivation such as attending morning classes. These two students would require very different advising strategies to support their academic needs because they have differing skills and weaknesses. These differences demonstrate the need for an assessment tool that can identify the particular reasons a student is struggling academically. Understanding and recognizing these unique attributes can help advisors attend to the needs of the individual.

In addition, this study determined if there were any differences between students in two sample populations. It is hypothesized that if students are struggling academically, then they will likely have low motives, low strategies or both. In addition, it is hypothesized that students who are doing well academically will have high motives, high strategies, or both. The current research compared a group of struggling students to a group of non-struggling students to assess if these trends did in fact emerge.

CHAPTER II – REVIEW OF THE LITERATURE

Identifying the individual components contributing to academic success is an essential task. In order or achieve high academic standings, individuals must do the following: know how to complete the tasks that are required, believe they are capable of completing those tasks, and be motivated to complete those tasks. The literature pertaining to academic success has suggested that the variables attributing to this include effective study strategies, motivation, goal orientation, self-efficacy, self-regulation, and metacognition (Eccles & Wigfield, 2002; Hartwig & Dunlosky, 2012; Karpicke & Roediger, 2007. These topics will be discussed in further detail to demonstrate how these constructs equate to academic success.

Study Strategies

In the late 1800s Hermann Ebbinghaus was one of the first individuals to conduct early studies that evaluated memory. Ebbinghaus was interested in understanding the relationship between memory retention and time. To assess this relationship he created a series of lists comprised of *nonsense syllables*, a string of letters that amount to a single syllable that is void of meaning. He carried out studies where he would learn the lists of nonsense syllables and then later attempt to recall the syllables from the lists (Gilliland, 1948). Ebbinghaus chose to utilize nonsense syllables instead of lists of already known words, because he wanted to eliminate any prior knowledge or understanding that would affect the *new* learning that he wanted to study. The findings from his research are still relevant in memory studies today. Arguably the most important finding of his research was his discovery of the forgetting curve, which describes the decline in memory retention over time. Initially retrieval of recently learned information is easy to recall, but as time passes the ability to recollect the information declines.

Since Ebbinghaus conducted his research, the number of studies pertaining to memory has grown exponentially. Many aspects of memory are relevant in relationship to academia. Memory is imperative to the learning process. Learning is the act of acquiring skills or knowledge resulting in the permanent change in the state of the learner in which the learner becomes competent and proficient (Dweck, 1986; Schacter, Gilbert, Wegner & Nock, 2014). According to Dweck (1986) effective learning occurs when one applies or transfers what one has learned to novel tasks and situations that embody similar underlying principles. Knowledge that is firmly implanted in long term memory has greater opportunity for retrieval, generalizability, and application in varying contexts. Historically, academic research has identified components that contribute to the solidification of information into long-term memory for later recall. The evaluation of this information has a practical application; we can improve the student learning process by researching techniques that promote effective learning. Many of these techniques are related to study strategy practices.

Study strategies are a key component of academic success, and selection of the appropriate strategy for the task is essential. One strategy that is often utilized by many students is massed practice. Massed practice is defined as the continuous practice of a task without rest (Donovan & Radosevich, 1999). An example of a student employing massed practice would be cramming for an exam for multiple hours the night before an exam. This is an ineffective study approach because the information learned in this time period is likely to fade from memory quickly due to minimal amounts of exposure to the material (Brown, Roedinger, & McDaniel, 2014). A better study strategy is to break up the studying into shorter time periods over multiple days or weeks. Breaking up the study process into multiple time blocks is called distributed practice, also known as spaced practice (Dunlosky, Rawson, Marsh, Nathan, & Willingham,

2013). Through meta-analysis Donovan & Radosevich (1999) found that students who participated in distributed practice performed significantly better than those who participated in the massed practice conditions. Kapler, Weston, & Wiseheart (2015) found similar findings. In their study, subjects were presented with lecture materials and then were re-exposed to those materials either one day or eight days later. In a follow up test five weeks later, those who had repeated exposure to materials eight days after the initial exposure performed better on test performance than those who had repeated exposure to lecture material one day after the initial exposure. By having time between exposures of the new material, the brain has time to process and categorize the information. Each subsequent exposure builds on the already existing information and leads to better retrieval of that information in the future (Carpenter, Cepeda, Rohrer, Kang & Pashler, 2012). Distributed practice is only one of many useful study strategies.

In addition to distributed practice, meaningful learning is essential to erudition. If a student memorized the definition for a word without understating what it meant, the student would not be able to use the word in a differing context than that for which it was learned. Instead, learning the meaning of a word allows for transferability. Comprehension is essential in the learning process because it allows for information to build on existing knowledge (Brown et al., 2014; Mayer, 2002). For example, Demirbaş (2014) conducted a study that evaluated meaningful learning among pre-service science teachers. Subjects of this study held misconceptions about laws of science. Demirbaş wanted to determine if introducing meaningful learning activities to classroom curriculum would change these misconceptions. For this study participants were instructed to actively engage in the meaningful learning process by relating new information to information they already knew. By making ties to the old information, the students were able to eliminate their misconceptions. Results of this study revealed that when

pre-test scores were compared to post-test scores students scored higher on the post-test scores. This indicates that meaningful learning activities promoted students' conceptual understanding of the previously misunderstood material (Demirbaş, 2014). For students to improve their academic performance they should ensure their study strategies incorporate meaningful learning processes.

There are many ways to promote meaningful learning, and students *should* engage in these behaviors to be academically successful. However, often the processes they select are not the best for attaining that goal. For example, a common study practice involves re-reading. That is, a student may re-read a section multiple times in an attempt to learn the material. The process of re-reading does not aid a students' comprehension of the material. There is a misconception that re-reading material will enhance the ability to remember information, but this is not shown to be true (Callender & McDaniel, 2009).

An alternative approach to re-reading textbook material is to employ retrieval practice. Retrieval practice occurs when an individual attempts to retrieve information from memory after exposure to new material (Roediger & Butler, 2011). Retrieval practice can be employed by testing one's self. Self-testing allows students to assess performance and gauge mastered knowledge. An example of a student practicing self-testing would be reading a chapter or section of a book, setting the book aside, and then trying to summarize, in one's own words, what the chapter discussed. Once this task is complete, the student can then assess if information is clearly understood, and whether or not information may require more thorough review for learning.

In addition, personal summarization of the material facilitates the identification and organization of the main ideas of the text (Dunlosky et al., 2013). This process aids in a

student's overall understanding of the meaning and content of the material and helps solidify information in long-term memory for later retrieval. Roediger and Karpicke (2006a) performed a study where participants were broken up into two groups and were then asked to read a passage. One group was instructed to repeatedly study the passage while the other group was instructed to retrieve information from memory, and write down as much information as they could from the passage. In follow up tests, subjects who utilized retrieval practice retained more information from the passage than those who were asked to study the passage. These findings suggest that self-testing and summarization improve learning and allow for later transferability and use of newly learned information.

Retrieval practice techniques, similar to self-testing, can also be applied to the classroom through test and quizzes. Tests and quizzes are useful tools in an academic setting because they aid in the assessment of knowledge acquisition. According to Wasylkiw, Tomes, & Smith (2008) assessments are useful to "evaluate student learning, motivate student achievement, assess teaching effectiveness, and reinforce learning" (p.243). Tests and quizzes improve long term memory by the engagement and enhancement of retrieval processes. (Agarwal, Bain, Chamberlain, 2012; McDaniel, Agarwal, Huelser, McDermott, & Roediger, 2011; Roediger & Karpicke, 2006b). Lemming (2002) conducted a study where he applied regular quizzes to his 5-week summer term course on learning and memory. Each class meeting, a quiz was administered that incorporated two short-essay questions during the first 10-15 minutes of the class period. Once the exam was completed, there was a follow up discussion of the correct answers to the quiz questions for about two-three minutes. The end semester grades were compared to a traditional class where the same material was taught, but students received only four exams. The results showed that in the course where tests were administered daily, the

average semester grades were half a letter grader higher than the courses with only four exams. In addition, students reported that the class procedure led to more studying, they kept up with the material better, and they learned more than in their other courses (Lemming, 2002). In this research, Lemming was employing retrieval practices through regular test administration. This study suggests that practicing these types of testing procedures, both individually and in the classroom, can increase academic success because testing impacts study strategies and knowledge acquisition.

One final study technique that is emerging in the research is interleaved practice also referred to as mixed practice. Interleaved practice is the process of alternating between different types of items or problems while studying (Dunlosky et al., 2013). Research suggests that this approach, in contrast to blocked practice (all content from one subtopic or all problems of one type are studied before moving on to a differing set of material) enhances learning (Birnbaum, Kornell, E. Bjork, & R. Bjork 2013). While it is important for the learning of new material to build off of existing knowledge, it is also important that new information can be contrasted to existing knowledge. For example, when a student applies a solution to a math problem they must understand how the problem differs from other math problems to attribute the appropriate solution to the problem.

Taylor & Rohrer (2010) explain that learning requires discrimination and that it is important that individuals are exposed to varying conditions in order to adequately categorize information to problem solve which in turn can help them to better understand the world. In their study twenty-four students were broken up into two groups one utilizing interleave practice techniques (which refers to variability in the order which one performs tasks) versus other block practice techniques (which refers to performing tasks in the same sequence each time). Students

were taught four different types of mathematics problems. Each group saw the same tutorials, examples, practice problems, and test problems, although the order of the examples and practice problems depended on whether practice was interleaved or blocked. A pre-test with samples of each type of question was administered to all participants in addition to their practice sessions. When follow up tests were administered a day later, test scores from the interleaved group were double that of their pre-test scores from the previous day (Taylor & Rohrer, 2010). This suggests that interleaved practice is a better study approach than blocked practice because it enhances retention of newly learned material. If students interleave their study practices the results will likely be increased academic success.

Overall, the research pertaining to study strategies indicates that some study strategies are more effective for deep meaningful processing and better retention of material in long-term memory than others. The benefit of this knowledge is that these findings can be applied to study strategy interventions for struggling students. Students can improve academic standings by implementing study strategies that result in retention and transferability of knowledge.

Motivation

Although study strategies and techniques are important in academic success, research has shown that motivation to learn is also an integral part of the learning process. Motivation is a complex concept that is defined as "the processes underlying the initiation, control, maintenance, and evaluation of goal-oriented behaviors" (Dresel & Hall, 2013, p. 58). In a majority of studies motivation evaluates how human behavior is impacted by biological processes such as our need to obtain food and water. However, within the context of academia, motivation is usually assessed within the realms of intrinsic motivation versus extrinsic motivation.

Intrinsic motivation involves engaging in a behavior because it is personally rewarding; essentially, performing an activity for its own sake rather than the desire for some external reward. In contrast, extrinsic motivation occurs when we are motivated to perform a behavior or engage in an activity in order to earn a reward or avoid a punishment (Schacter et al., 2014). Motivation studied from the intrinsic and extrinsic perspective is advantageous in that it allows researchers to evaluate the magnitude of influence each has in varied academic situations (Lowman, 1990). Much of the research has shown that high levels of intrinsic motivation for learning correlate with academic success (Grant & Dweck, 2003; Lent, 2014; Vansteenkiste, Lens, & Deci, 2006; Ramdass & Zimmerman, 2011; Zimmerman, 1990). Lowman (1990) suggests that an overemphasis on extrinsic rewards, such as exam scores, often weakens intrinsic desires to learn.

A study by Benware and Deci (1984) evaluated taking an active orientation to learning compared to a passive orientation to learning to determine if students learning with an active orientation would become more intrinsically motivated. In their study, forty-three students were given an article to read over the course of a school break. Students were broken up into two groups where they were assigned a learning task based on the reading. The first group was told they would take an exam upon returning to school that was based on the article and they would have to score as high as possible. The second group was told they would need to teach another student the content of the article and that that student will be given an exam based on the teaching session. It was hypothesized that those who have to teach would create a more active orientation to learning and in turn would have increased intrinsic motivation which would result in deeper learning.

Results of the study showed that subjects who learned the material in order to teach reported feeling more active in the learning process and expressed more intrinsic motivation compared to the control group. In addition, these subjects showed a greater conceptual understanding of the material. Benware and Deci (1984) concluded that an active oriented learning environment that promotes intrinsic motivation for learning will result in improved conceptual learning compared to a passive learning environment which is aimed at simply passing an exam. These findings suggest that structuring learning to emphasize intrinsic motivation versus extrinsic motivation may increase academic success.

Goal Orientation

In addition to motivation, goal orientation also shapes and influences academic success. Most of the literature breaks goal orientation into two constructs. The first is learning goals, also known as task goals and mastery goals. These are goals that are aimed at gaining a deeper knowledge and understanding of ideas and concepts. In contrast, performance goals, sometimes called ability goals and ego-goals, focus on the self or self-worth and the primary objective is to show evidence of ability by being successful and to outperform peers Dweck (2008). Because performance goals are directed at superficial aspects of academic tasks, performance goals rarely contribute to comprehension and deep understanding (Ames, 1992; Ames & Archer, 1988; Dweck, 1986; Grant & Dweck, 2003).

Historically research has suggested that learning goals directly influence motivation and academic performance. Grant & Dweck (2003) found that learning goals predicted a range of mastery-oriented indicators including persistence, planning, and intrinsic motivation. Findings also indicated when students were faced with a challenging course those who had learning goals

were predicted to have better processing of course material, higher grades, and higher levels of intrinsic motivation compared to students with performance goals (Grant & Dweck, 2003).

Furthermore, research has demonstrated that there is a strong relationship between goal orientation and self-regulation and goal orientation and self-efficacy. That is, those individuals that are more learning goal oriented tend to demonstrate a greater understanding of their abilities (self-efficacy) and exert more meaningful strategies and tactics (self-regulation) when studying (Komarraju & Nadler, 2013). A study by Schunk (1995) evaluated the relationship between self-efficacy and self-regulation with academic achievement outcomes. In his research, 40 fourth-grade students were evenly divided into a learning goal condition, where students were instructed to evaluate their problem solving abilities, or a performance goal condition, where students were not instructed to evaluate their problem solving abilities, while attempting to solve a series of math problems. When post-condition scores were compared to pre-condition scores participants in the learning goal group had higher self-efficacy scores, were more task oriented, were more self-regulated and reported higher levels of self-satisfaction than the performance goal group. These findings are consistent with research pertaining to learning goals and performance goals suggesting a change in goal orientation to learning goals will result in academic success.

Self-regulation

As mentioned above, research has found a relationship between goal orientation and self-regulation. Self-regulation, referred to as thoughts, feelings, and actions that one exercises when pursuing goals (Pintrich & De Groot, 1990), can be applied to various aspects of human life such as exercise, eating habits, sleeping habits etc. According to Kaplan (2008) there are a variety of variables which influence self-regulation and they include: cognition, emotion, motivation,

behavior, personality attributes, and the physical environment. What is important to discuss however, is how these components contribute to academic self-regulation and learning.

Zimmerman (1990) suggests that self-regulated learners "plan, organize, self-instruct, self-monitor, and self-evaluate at various stages of the learning process" (p. 185). Those who self-regulate well are often the students that excel academically. Typically self-regulated learners are very structured and they create environments that are ideal for their learning. Cohen (2012) conducted research that evaluated self-regulation among college students. For the purpose of this study, students enrolled in a math class were divided into two groups, a control group and a group receiving a self-regulated learning intervention which taught students how to detect errors and make adaptations when solving math problems. Students were given quizzes every two to three class sessions. The self-regulation group was instructed to correct errors on their quizzes and then re-submit the corrections with an explanation for their corrections and an example of a new strategy to solve the problem. They were also asked to indicate their confidence in solving another problem in the future. Results showed that individuals in the self-regulation group outperformed those in the control group on three math examinations. These findings suggest that improvements in self-regulation behaviors will result in improved academic outcomes.

Metacognition

Metacognition is one's ability to monitor and evaluate learning (Flavell, 1979) and has been referred to in the literature as metacognitive beliefs, metacognitive awareness, metacognitive knowledge etc. Regardless of the terminology much of the focus of metacognitive research has attempted to understand how it relates to academic success. Research by Dunning et al. (2004) and Chew (2010) suggest that individuals often make flawed self-assessments about

their learning. According to Chew the difference between a strong student and a weak student is their quality of metacognition. Dunning et al. (2004) suggest that good students have an accurate understanding of when they have mastered material, but weak students tend to be overconfident about their knowledge. Yeşilyurt (2013) conducted research that evaluated the relationship between metacognitive awareness, achievement focused motivation and study processes. The results of the research found that metacognitive awareness and achievement focused motivation are strong predictors of study processes. This suggests that if a student is aware of their own learning and is motivated to learn, then they will likely have better methods for studying. Tobias, Everson, & Laitusis, (1999) also found a significant relationship with school grades and knowledge monitoring indicating that self-awareness contributes to academic success.

Students with poor metacognition often have misconceptions about the learning process which impact the study strategies they employ. Students believe that they will be able to recall information with minimal effort if the material took little effort to understand (Zmuda, 2008). For example, a student who understands the content of a lecture may choose not to review the material prior to examination thinking that he or she has "learned" it. Similarly, students think that reading a chapter in a textbook means they have learned the material through sheer exposure. These are commonly used study tactics that result in superficial information processing. Students may be able to retain and recall learned information from memory initially, but as time passes the ability to retrieve the information fades (Brown, Roediger, & McDaniel, 2014; Easley, 1937). Furthermore, superficial information processing often limits transferability of knowledge. As a result, students will likely be unable to transfer the knowledge obtained from a lecture or a textbook to new situations (Larsen-Freeman, 2013).

Additionally, research has found a strong relationship between metacognition and self-regulation. In another study, Nash-Ditzel (2010) investigated the relationship between metacognitive reading strategies and self-regulation. In this case study, five college freshmen were selected for a 10-week project. All five participants had received support for reading during elementary and/or middle school years and received low scores on the mandatory college entrance exam. Over the course of 10-weeks the participants received training to improve their metacognitive reading strategies. They then worked in small groups to practice these strategies and eventually transitioned to independent assignments. At the end of the 10-week period all five students had dramatic improvement in their reading abilities when compared to their reading ability scores on their college entrance exams. The results suggest that the students' enhanced knowledge about reading strategies (metacognitive knowledge) allowed them to become more self-regulated learners. The participants also reported that because these strategies had been practiced for an extended period of time, the strategies had become internalized and students reported employing these reading strategies for other classes and other non-academic reading tasks (Nash-Ditzel, 2010). Findings from this study suggest that academic success can be improved when metacognitive awareness is increased because it is directly linked to self-regulation behaviors.

Metacognitive awareness is not restricted to reading activities. Karpicke, Butler, & Roediger (2009) looked at the relationship between metacognitive strategies and retrieval practice. They discovered that students do not understand that retrieval practice enhances knowledge and as a result students rarely employ these strategies when studying. This also relates to research by Sundqvist, Todorov, Kubik, and Jönsson (2012) who evaluated judgment of learning (JOL), which is a judgment about how well something has been learned. Accurate

JOL is essential because these self-assessments will influence self-regulated study efforts. If students cannot make appropriate judgments of learning it is likely that they will struggle academically.

Self-efficacy

Another variable contributing to academic success is self-efficacy. According to Bandura (1997) self-efficacy is one's belief in their personal capabilities. Self-efficacy shapes human functioning by influencing people's thoughts, feelings, and behaviors (Bandura, 1993). The opinion that one holds about their abilities will impact how they respond to environmental factors and pursue and set goals. Research suggests that those who have low levels of self-efficacy are more likely to have low aspirations and tend to avoid difficult tasks. Individuals with low self-efficacy have a tendency to attribute failures to lack of ability and often times give up quickly when faced with difficulties. In contrast, individuals who have high levels of self-efficacy approach difficult tasks with the ambition to master challenges. Those who have high self-efficacy set challenging goals and remain committed to them (Alt, 2015; Bandura, 1993; Bandura, 1997; Dweck, 1986; Schunk, 1990). Changes to the classroom context and setting can influence how students' develop their behaviors and beliefs pertaining to their own academic abilities by attributing failures to lack of knowledge instead of lack of ability. If students believe they are capable of completing academic tasks they are more likely to engage in the material. If students are more thoroughly engaged they will better learn the information which will positively impact their academic success.

CHAPTER III – METHODS

Participants

Participants for this research were recruited via the registrar's office at a public, 4-year mid-sized institution in the Appalachian region of the US. A list was created that identified students currently enrolled at the university that had grade reports of As and Bs for all classes at the fifth-week grading term. A total of 3,516 students met this criterion. In addition, a separate list was created that identified students earning one or more fifth-week grades below a "C". A total of 2661 students met this criterion. An email was sent from the registrar's office to all 6,177 students asking if they would like to participate in a study pertaining to study strategies and help seeking behaviors (help seeking data not discussed in this paper). A hyperlink to the survey materials was included in the email and those who participated in the study accessed the survey by clicking on the hyperlink.

A total of 178 responses were collected from the survey. Due to complications resulting from a computer malfunction, where some responses were not recorded, we were only able to evaluate data for 129 subjects. A total of 86 responses were from the A and B only population while 43 responses were from the one or more C and below population. Of the 129 subjects 94 were female and 35 were males. In addition, 53 were freshman, 24 sophomores, 33 juniors, and 18 seniors. One subject did not report their class level. Finally, ages ranged from 18 years to 46 years (M=20). Data was recorded through Qualtrics, and was analyzed through SPSS.

Instrument

The Revised Study Process Questionnaire (R-SPQ-2F) is a 20 item survey created by Biggs (1988). The questionnaire assesses four constructs associated with student study

strategies. The constructs are deep strategies (DS), surface strategies (SS), deep motives (DM), and surface motives (SM). Item responses for this questionnaire are answered on a five-point Likert Scale ranging from 1 (Never or only rarely true of me) to 5 (Always or almost always true of me). Sample questions for each construct are as follows: SM - "My aim is to pass the course while doing as little work as possible", DM - "I work hard at my studies because I find the material interesting", SS - "I learn some things by rote, going over and over them until I know them by heart even if I do not understand them", DS - "I work hard at my studies because I find the material interesting". In addition, there was a short demographic questionnaire that asked participants' gender, age, class rank, and major.

Procedures

Students who met the categorical conditions for the two samples were sent an email invitation to participate in the study via the university registrar's email address. The email informed students that they had been selected to participate in a study which evaluated student study strategies and academic help seeking of students in college. The email served as the informed consent for participants and indicated that their participation in the study was voluntary, that all information obtained in the survey was completely anonymous, and that there would be no contact with participants after the survey was been completed.

Within the email there was an embedded hyperlink to the SPQ and the short demographic questionnaire. Subjects in both groups received the same informed consent and had access to the same survey materials, but the hyperlink differed for the group earning all As and Bs compared to the group of students earning at least one grade of C or below. This allowed responses to be categorized based off of our grouping criteria. Students in both groups consented to the study by clicking on the hyperlink provided in the email.

CHAPTER IV – RESULTS

Reliability

To evaluate the reliability of the SPQ questionnaire the Cronbach α value was computed using SPSS. The Cronbach α value was 0.819 when all 20 questions were assessed together.

Z-Score and Correlation

In order to visualize a relationship between study strategies and motivation the dataset was converted to a multidimensional scale. This instrument is usually designed to reflect 4 constructs of DM, DS, SM, and SS. This study utilizes the scores from these constructs on a continuum ranging from DM to SM and DS to SS. Data for surface motives and surface strategies needed to be reverse coded and combined with deep motives and deep strategies to create scores for an individual's overall motives and overall strategies. In order to assess the constructs of motives and strategies simultaneously, the data was then converted to Z-scores to standardize the subscales. Strategies versus motives were applied to an X and Y coordinate plane in order to create a scatter plot to depict the data visually, as shown in Figure 1. Motives are plotted along the X axis from low to high and strategies are plotted along the Y axis from low to high. Blue dots on the chart represent students with As and Bs. Red dots on the chart represent students with one grade of a C or below.

The multidimensional scale represents four quadrant types. The quadrants include deep motives (DM) and deep strategy (DS); surface motive (SM) and deep strategy (DS); and surface motive (SM) and surface strategy (SS); and deep motive (DM) and surface strategy (SS). A dot in the upper right quadrant represents someone with DM and DS scores. In contrast, a dot in the lower left quadrant represents someone with SM and SS. The lower right quadrant represents

DM and SS and the upper left quadrant represents DS and SM. If a student had a raw score of 19 on motives and 18 on strategies their Z-scores would be -1.84 and -2.13 which would place them in the lower left quadrant. In contrast, if a student had a raw score of 36 on motives and 35 on strategies their Z-scores would be .87 and .84 which would place them in the upper right quadrant. Additionally, the data reveals a positive correlation of 0.76 between motivation and study strategies.

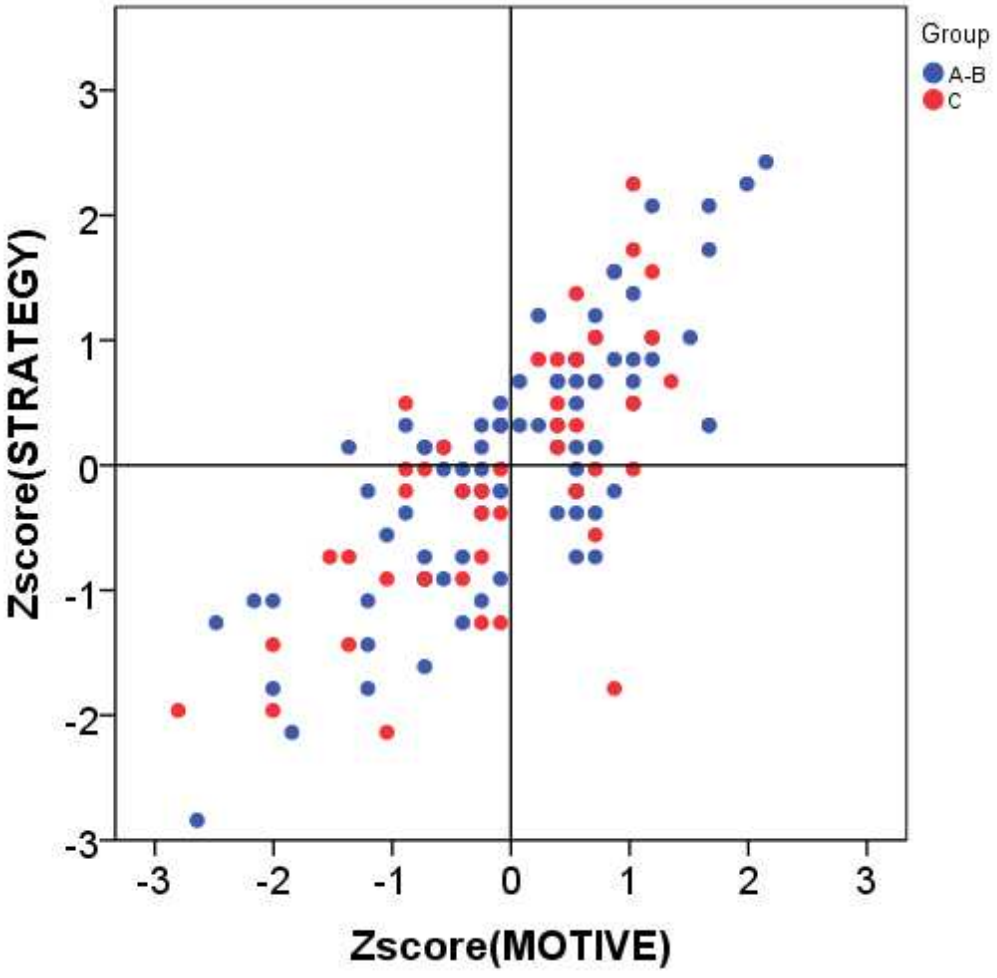

Figure 1. Multidimensional Scaling of motives versus strategies for AB and C students

T-score

A random number generator was used to select 10 students from each sample and convert their scores to t-scores. This was done to demonstrate how this survey provides information about individual scores of motives and strategies. By looking at the output in Figure 2. and Figure 3. one can assess an individual's motive score and strategy score. In addition, this conversion allows for an easy assessment of how far an individual lies above or below the mean for both motivates and strategies.

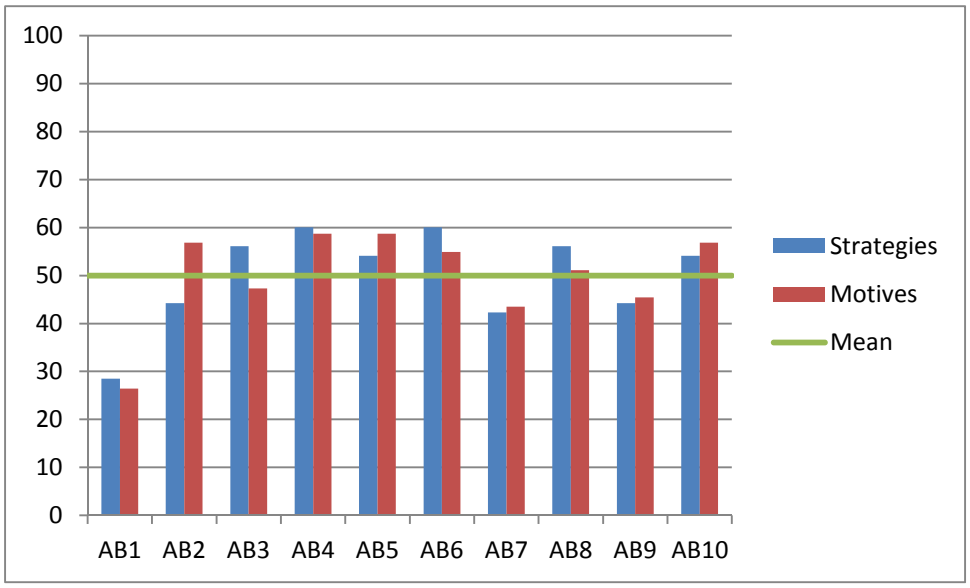

Figure 2. T-score results for AB sample

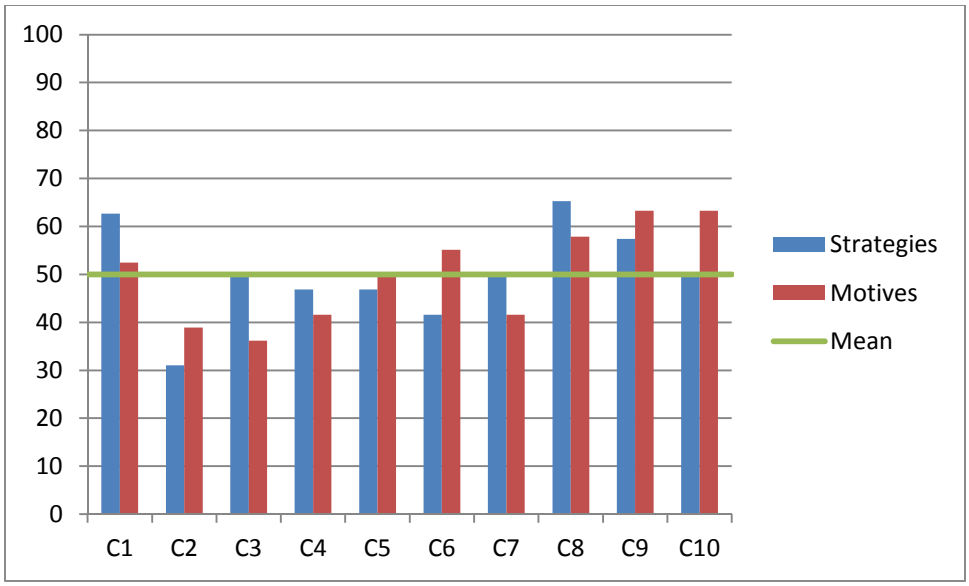

Figure 3. T-score results for C sample

ANOVA

The analysis of variance was the statistical method used to test differences between the two population groups of A-B students, and students with C's. A-B Motive (M = .058, SD = 1.00) and Strategy (M = .068, SD = .98). C Motive (M = -.11, SD = .98) and Strategy (M = -.13, SD = 1.03). There was not a significant difference between groups for strategies or motives F (1, 127) = .892, p = .347 at the p <.05 level.

CHAPTER V – DISCUSSION

Much research concerning student success has been accomplished with the goals of helping students improve academically and to decrease dropout rates among college students. Though previous research has been informative in these areas, the results obtained from these studies have not been utilized prescriptively and diagnostically. The purpose of the current research was to create a tool that could be utilized for individualized advising programs. Though many students accepted into colleges and universities are expected to excel academically, there is a high trend in dropout rates. As has been suggested throughout this paper, the reason for the poor retention rate seems to result from students' inadequate preparation prior to college (Bjork, Dunlosky, & Kornell, 2013). Students seem to lack effective study strategies and have poor motivation (Elliot & Harackiewicz, 1996). Research has demonstrated that modifications to study strategies and motivation can improve academic performance, but there has yet to be a practical application of these findings.

In order to improve study strategies and motivation, the current study converted the SPQ to a multidimensional scale to use the instrument diagnostically and prescriptively. By converting the survey to this format, we were able to create four quadrants which represent four "types" of students. Presenting the survey responses in this manner, allows for identification of individual strengths and weaknesses related to study strategies and motivation. Advising programs and interventions will be more informed about the individual weaknesses of students. Having this information will allow students to be counseled to their specific needs.

It was initially presumed that the current research would show that motivation and study strategies were mutually exclusive variables. This being the case, when the data from this study

was collected it was hypothesized that there would be a more even distribution of subjects among the four quadrants. The data reveals there are in fact subjects who fall into all four quadrants, however, it is not evenly distributed. The data also showed that study strategies and motives were instead highly correlated. This suggests that these variables are highly predictive of one another. Typically subjects who were deeply motivated also had deep study strategies. In contrast, those who had surface motivation generally also had surface strategies.

Even though these results differed from the initial hypothesis, it still offers valuable information about student's motives and study strategies. The T-score analysis results indicate that we can still identify if an individual student needs help in the area of motivation, study strategies, or both. For example in Figure 3. subject C6 motivation is above the mean and study strategies fall slightly below the mean. This would imply that remediation targeted at improving study strategies would be most appropriate for this student. Conversely, student C2 scores significantly lower in both study strategies and motivation when compared to the mean. Student C6 would need a different plan for remediation than student C2. As stated by Renzulli (2015), these individualized assessments would support more specific identification of the strengths and weakness of these individual learners, and lead to more effective advising strategies.

Study limitations/Future research

As discussed above, the multidimensional scaling showed a correlation between motivates and study strategies resulting in most subjects falling into either the DM and DS or SM and SS quadrants. Additionally, there was not a statistically significant difference between A-B students and C students. Perhaps the reason for the discrepancy between the hypothesis and results can be attributed to the qualification used to separate "high achievers" from "low achievers". Participants selected for this study were categorized based on the sole criteria of

making only A's and B's in all coursework versus students who had at least one C or below at the fifth week grading mark. These criteria may not accurately identify "low achieving" students. In fact, a high achieving student with mostly A's and B's, may have only one low grade and be put into the "low achieving" group. Perhaps a more appropriate selection process should categorize based on GPA.

Whether we change the selection criteria, or repeat similar studies with larger sample populations, future research needs to be conducted on motivation and study strategies. There are many ways that this research can be expanded upon. For example the current research could go one step further and determine if there is a correlation between students study strategies and motivations and their help seeking behaviors. Gaining knowledge about students' strengths and weakness in regards to learning helps teachers understand how to structure courses to promote effective learning. In addition, knowledge about strengths and weaknesses helps advisors know why a student is struggling and this information helps advisors counsel students' based on personal needs.

More importantly, we need to develop practical applications of this knowledge by making it useful to academic advisors, tutors, professors, or others who want to help students. The conversion of the SPQ has successfully demonstrated the potential for use of the survey information both prescriptively and diagnostically. Hopefully, future researchers will be inspired to further explore ways to help students improve academically.

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APPENDIX

APPENDIX A: Revised Study Process Questionnaire (R-SPQ-2F)

- This questionnaire has a number of questions about your attitudes towards your studies and your usual way of studying.
- There is no right way of studying. It depends on what suits your own style and the course you are studying.
- It is accordingly important that you answer each question as honestly as you can. If you think your answer to a question would depend on the subject being studied, give the answer that would apply to the subject(s) most important to you.

	Never or only rarely true of me	Sometimes true of me	True of me about half the time	Frequently true of me	Always or almost always true of me
1. I find that at times studying gives me a feeling of deep personal satisfaction.	❍	❍	❍	❍	❍
2. I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.	❍	❍	❍	❍	❍
3. My aim is to pass the course while doing as little work as possible.	❍	❍	❍	❍	❍
4. I only study seriously what's given out in class or in the course outlines.	❍	❍	❍	❍	❍
5. I feel that virtually any topic can be highly interesting once I get into it.	❍	❍	❍	❍	❍
6. I find most new topics interesting and often spend extra time trying to obtain more information about them.	❍	❍	❍	❍	❍
7. I do not find my course very interesting so I keep my work to the	❍	❍	❍	❍	❍

minimum.					
8. I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.	❍	❍	❍	❍	❍
9. I find that studying academic topics can at times be as exciting as a good novel or movie.	❍	❍	❍	❍	❍
10. I test myself on important topics until I understand them completely.	❍	❍	❍	❍	❍
11. I find I can get by in most assessments by memorizing key sections rather than trying to understand them.	❍	❍	❍	❍	❍
12. I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.	❍	❍	❍	❍	❍
13. I work hard at my studies because I find the material interesting.	❍	❍	❍	❍	❍

	Never or only rarely true of me	Sometimes true of me	True of me about half the time	Frequently true of me	Always or almost always true of me
14. I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.	❍	❍	❍	❍	❍
15. I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a	❍	❍	❍	❍	❍

passing acquaintance with topics.					
16. I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined.	❍	❍	❍	❍	❍
17. I come to most classes with questions in mind that I want answering.	❍	❍	❍	❍	❍
18. I make a point of looking at most of the suggested readings that go with the lectures.	❍	❍	❍	❍	❍
19. I see no point in learning material which is not likely to be in the examination.	❍	❍	❍	❍	❍
20. I find the best way to pass examinations is to try to remember answers to likely questions.	❍	❍	❍	❍	❍