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To our readers

This issue of TLAR reflects on our reported that more information of our field because its purpose

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## LETTER FROM THE EDITORS

To our readers:

This issue of The Learning Assistance Review presents a range of lenses through which reflect on our practice. The first lens is provided by research. There are three research studies reported that represent both qualitative and quantitative methodology. The second lens is more informal but shares a wealth of citations to frame a discussion around the semantics of our field. The third lens is provided through a book review that you may have missed because its primary focus is on school children.

The first article comes from the National Center for Developmental Education where Boylan, Bonham and Rodriguez have explored the current research on the effectiveness of remedial courses. Among other things, they look at the distinctions in success rates between community colleges and universities and also between students who need different amounts of remediation.

Following this, Denzine and Pulos take a look at a population that is often overlooked in learning assistance, graduate students. By administering a study process questionnaire and then analyzing the data, they found significant evidence that graduate students do not necessarily have well developed study skills.

A special report is included in this issue in order to share a part of Martha Casazza's experience in South Africa last year. In the case study she reports, it is clear that learning assistance programs worldwide share similar situations. WE hope that by publishing this report, we are encouraging communication and increased collaboration with colleagues around the world.

In *Join the Conversation*, Jeanne Higbee provides much good for thought as she discussed the language used within our profession. Through a well-cited argument, she contends that all students are engaged in a developmental process and that we need to examine our language and goals to reflect this. This is a piece to which we particularly encourage you to respond. We will gladly publish thoughtful responses in a future issue.

Finally, Cecelia Downs reviews a book, Altered Destinies: Making Life Better for Schoolchildren that most of us would have missed. She very adroitly takes its message regarding the needs of students from low-income areas and applies it to our work in higher education. It is interesting to be reminded that many of the same tenets apply across levels of education.

Please use the various lenses provided in this issue to reflect on your practice and perhaps to reexamine some of your assumptions.

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*By Hunter R.  
Appalachian*

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## ARTICLES

### **WHAT ARE REMEDIAL COURSES AND DO THEY WORK: RESULTS OF NATIONAL AND LOCAL STUDIES**

*By Hunter R. Boylan, Barbara S. Bonham, and Lizette M. Rodriguez,  
Appalachian State University*

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#### **Abstract**

This article explores the current research on the effectiveness of remedial courses. In so doing, the authors define remediation in relation to developmental education, discuss the purpose of such courses, and explore the circumstances under which remedial courses succeed or fail in the accomplishment of their goals.

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#### **Introduction**

The subject of college level remediation has been the target of much criticism in recent years. Legislators argue that taxpayers should not have to pay to have high school level material taught in college. Parents and students complain that remedial course requirements extend the amount of time and money necessary to complete a college degree. Community college administrators worry that an emphasis on remedial courses erodes the vocational, technical, and college transfer missions of their institutions.

The authors have consistently argued that few of these criticisms are valid (for a further discussion of these issues, see Boylan, 1998 and Boylan, 1999 cited in the references of this article). Nevertheless, as professionals, we need to offer more than a "knee-jerk" defensive response to critics of remediation. We should be willing to explore the issue of whether or not remedial courses actually accomplish their objectives. We should also be prepared to explain exactly what remedial courses can or cannot do as well as what is required to make them effective.

This article explores the research on remedial courses in an effort to determine if they are successful in accomplishing their purposes. In so doing, it defines remedial courses, explains the difference between developmental education and remedial courses, reviews the literature

on their outcomes, and attempts to explain what may or may not contribute to the success of remedial courses.

### What is Remediation?

Before defining remediation, it should be noted that remedial courses are not synonymous with developmental education. The term "developmental education" refers to a continuum of interventions designed to promote a combination of cognitive and affective development for underprepared students. The activities of developmental education range from courses to tutoring to learning laboratories and are usually carried out according to the principles of adult development and learning, hence the term "developmental" education.

Among the interventions used in developmental education are remedial courses. These courses typically teach pre-college material and are designated with a numbered prefix below 100. According to the National Center for Education Statistics (NCES), the remedial subjects most commonly taught are English, mathematics, and reading (1996).

Frequently, there are several different levels of remedial courses, particularly in community colleges. The remedial prerequisite for college mathematics might be a Math 090 course, but there may also be prerequisites for the Math 090 course such as Math 070 and 080. Remedial courses, therefore, often run in a sequence of two to three levels and a student may be placed in any course within this sequence depending upon placement scores.

In addition, many colleges and universities offer courses that may be termed "developmental." Developmental courses do more than simply re-teach high school material. Clear-cut examples of such courses might include freshman seminars or other orientation courses, critical thinking courses, or study strategies courses.

Unfortunately, the distinction between remedial and developmental courses is not always that clear. A gap may exist, for instance, between what is typically taught in high school algebra and the prerequisite knowledge expected for an introductory calculus course. In such cases, a college Algebra 101 course may be in reality a developmental course. It is not remedial because the content was not fully taught in high school. Neither, however, is its content totally "college level." Instead, the content of developmental courses may fall into a gray area between high school and college, and the purpose of this content is to bridge the high school/college content gap.

Perhaps the best illustration of this is the freshman composition course currently required of most first-year students. This originated at Harvard University as a remedial course (Maxwell, 1997). Composition was considered a remedial course because Harvard faculty expected students to be able to write well when they arrived in college. Granted this assumption, composition was considered to be a pre-college activity. Unfortunately, most Harvard freshmen of the time could not write well enough to pass regular courses and, therefore, had to take a basic composition course (Maxwell, 1997). Freshman writing or Composition 101 courses are now a staple of any collegiate curriculum and no one considers



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them remedial. But, in reality they are developmental courses designed to bridge the gap between high school level and college level writing (Hull, 1998).

Attempts to distinguish between remedial and developmental content are further complicated by differences in standards among various types of institutions. Subject matter that might be considered remedial at a highly selective institution might be considered as a developmental or a regular curriculum course at an open admission institution. Generally speaking, if the objective of the course is solely to teach material generally acknowledged as pre-college then it is remedial, particularly if it does not employ the principles of adult learning and development in its design and delivery. If the objective of the course is to bridge the gap between where high school content may end and where college-level content may begin or to provide students with college-level learning skills, it is developmental. This is particularly true if the course employs adult learning and developmental principles in its design and delivery.

This discussion notwithstanding, the research findings discussed in this article are based on courses generally considered remedial. Furthermore, available research does not differentiate between remedial courses that are integrated with a developmental education effort based on the principles of adult learning and development and those that are not. Neither do the findings typically differentiate between various levels of remedial courses. Finally, most studies beg the issue of whether a course is, in reality, remedial or developmental. Essentially, the existing research explores only courses with a remedial (below 100) prefix in the subjects of English, mathematics, and reading. The convenience of selecting courses numbered below 100 for research purposes enables scholars to avoid the task of discriminating between remedial and developmental courses.

It is important, therefore, not to confuse remedial courses with developmental education. Remedial courses represent only a part of the whole of developmental education. Frequently, they do not even represent this. Remedial courses can provide a meaningful base contributing to the overall developmental education effort, but sometimes they do and sometimes they do not.

### Purposes of Remedial Courses

Most experts in the field would agree that remedial courses share a common purpose. The primary purpose of such courses is to prepare students for success in the college curriculum (McCabe & Day, 1998; Roueche & Roueche, 1999). If remedial courses are successful in accomplishing this purpose, then it is reasonable to expect students who take them to do the following:

1. complete them in a timely manner,
2. obtain passing grades in regular college curriculum courses, and
3. persist over time at levels comparable to other students.

The following sections of this article, therefore, explore existing research findings relating to these three issues.

## **Studies of Remedial Courses**

### **Completion of Remedial Courses**

One of the first major studies of remedial course completion rates was undertaken as part of the National Study of Developmental Education (Boylan, Bonham, Claxton, & Bliss, 1992). Using transcript analysis from over 5,000 students attending a randomly selected group of 150 colleges and universities, the study found that about 70% of students taking the highest level remedial course in a particular subject area completed that course with a C or better. Pass rates were lowest in remedial mathematics courses (60%) and highest in reading and study skills courses (77%).

A later study conducted by the National Center for Educational Statistics (1996) reported similar findings. Using institutional survey reports, the NCES study reported that approximately 75% of students taking remedial courses completed them successfully within one year. This study, however, used the criterion of "completing" remedial courses rather than passing them with a C or better.

Using a data set based on registration records of 1,334 students enrolled at a single CUNY university, Chen and Cheng (1999) studied a variety of outcome measures for remedial courses. They found that among students entering the institution in 1992, 66.5% completed remediation within one year. This completion rate represents the average for *all* remedial subjects.

Boylan and Saxon (1998) studied remedial courses in Texas colleges and universities using a combination of institutional surveys and student performance information from institutional reports. This study separated community college and university remedial course completion rates. The authors found that completion rates within one year for remedial courses in community colleges averaged 70.3%, and university completion rates averaged 72.7%. At both community colleges and universities the highest completion rates were in reading and study skills, and the lowest completion rates were in mathematics.

These findings are reasonably consistent, particularly given the fact that different methodologies (transcript analysis, registration records, statewide databases, and institutional surveys) were used to identify course completion rates, and data was drawn from different populations during different years. It should be noted, however, that most of these studies aggregated course completion rates for *both* 2-year and 4-year institutions.

### **Success in Follow-Up Courses to Remediation**

Experts consider one of the primary purposes of remedial courses to be preparation of students for success in the regular college curriculum (Boylan, Bonham, Claxton, & Bliss, 1992; Casazza & Silverman, 1996). However, there are few large sample studies available

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to identify the extent to which those who pass remedial courses are also able to pass their first college level course in a similar subject.

The only national study to explore this issue was the National Study of Developmental Education (Boylan, & Bonham, 1992). This study used student transcripts to identify the percentage of students who passed the *highest level* remedial course with a C or better and who also took and passed the first college level course in a related subject. The findings indicated that 91.1% of those who passed remedial English and who later took the first college English course passed the course. Of those who passed remedial mathematics and took college level math, 72.2% also passed this course. For reading, 83% of those who passed remedial reading and later took a social science course passed this course.

Another large sample study of this issue was conducted in Texas. This study used the database of the Texas Higher Education Coordinating Board which included a random sample of approximately 8,000 students taken from all Texas colleges and universities. Using this database, the researchers investigated pass rates in follow-up courses for students who passed *any* remedial course and later took the college level course in a related subject. The results indicated that 63.5% of those who passed remedial English and later enrolled in introductory English passed this course. Of those who took remedial mathematics and later enrolled in college mathematics, 34.9% passed their first college mathematics course. For reading, 70% of those who passed remedial reading and later enrolled in a college English course passed their first college English course (Boylan, et al., 1996).

The differences in findings from these two studies are dramatic. There is a difference of almost 28 percentage points in college English pass rates and a difference of over 42 percentage points in college mathematics pass rates in the two studies.

What might account for this difference? The most obvious explanation is that the national study included only students who had passed the *highest level* course in the remedial sequence. In Texas, students are permitted to take regular college courses as soon as they pass a statewide competency test regardless of whether or not they have finished the complete sequence of recommended remedial courses. The Texas study, therefore, included students who had passed *any* remedial course and gone on to take a college level course in a related subject.

In addition, the two studies used different methodologies, different populations, and different time periods. Consequently, some differences in outcomes might reasonably be expected when comparing a national study to a state-level study.

#### **Post-Remediation Grade Point Averages**

Several studies have explored the grade point averages of students enrolled in remedial courses. Kulik, Kulik, & Schwalb (1983) conducted a meta-analysis of findings from over 100 studies to examine the impact of remediation on the grade point averages of those who participated. They found that those who participated in remediation generally had grade point averages comparable to non-participants.

In 1991, Kulik & Kulik conducted another review of the literature on post-remediation grade point averages of remedial students. They concluded that "In nearly 80% of all studies, the GPAs were higher for students from the special remedial or developmental program" (p. 7).

Shoenecker and others (1996) compared the grade point averages of those students who placed in remediation and took remedial courses with the GPAs of those who placed in these courses and did not take them at 21 Minnesota community colleges. They found that the grade point averages of students who took remedial courses were significantly higher than those students placing into but not taking remedial courses.

The Chen & Cheng (1998) study mentioned earlier also compared the grade point averages of students who took remedial courses and those who did not. They found that, although remedial students had lower GPAs than non-remedial students during their early years in college, the GPA gap between the two groups closed with time. In fact, by their fifth year in college, the differences were actually reversed with former remedial students earning higher GPAs than non-remedial students.

#### **Retention Rates and Amount of Remediation Required**

If remedial courses accomplish their purpose of preparing students for success in college, then it is reasonable to expect that the retention rates of those who participate in remediation would be comparable to those who do not. Unfortunately, there are relatively few large sample studies exploring the retention of students who take remedial courses. Furthermore, the results of these are somewhat mixed. Boylan & Bonham (1992) found that students who enrolled in remedial courses at community colleges were slightly more likely to be retained or to graduate over a 3-year period than students who were considered college ready. Similar findings were reported in a 1996 study of students enrolled in Minnesota community colleges (Shoenecker, et. al., 1996) and in a 1998 study of students enrolled in Texas community colleges (Boylan & Saxon, 1998). In each of these studies, community college students who took remedial courses were somewhat more likely to be retained from year to year than students who were not required to take remedial courses.

The results from studies of university students taking remedial courses are not quite so consistent. Boylan & Bonham (1992) found that, after five years, university students taking remedial courses were slightly less likely to be retained or to have graduated than the general university population. The differences in retention rates, however, were only significant at research universities. Chen & Cheng (1998) also found that retention of remedial students lagged slightly behind that of non-remedial students at a large CUNY university.

Contrary findings, however, were reported in an earlier study by Kulik, Kulik, & Schwalb (1983), who conducted a meta-analysis of over 300 reports on the impact of remedial courses. They found that university students participating in remedial courses were actually more likely to be retained over time than non-remedial students.

Studies exploring the retention and graduation of those who take several remedial courses are also limited. Perhaps the most extensive of these was conducted by Adelman (1996).

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Using the NCES *High School and Beyond* 1972 data base, this study found that 45% of those who took one remedial course eventually obtained a baccalaureate degree but only 24% of those who took three or more remedial courses eventually graduated. Adelman goes on to point out that the greater the extent of remediation required by students, particularly in reading and writing, the less their likelihood of graduating from college.

Adelman's study looked, specifically, at retention for those involved in university level remediation. Several other studies have explored retention for those involved in community college remediation. A study of three cohorts of over 2,000 students each at Utah Valley Community College confirmed Adelman's findings for two-year institutions (Hoyt, 1999). After three years, only 28% of students taking three remedial courses were still enrolled but 37% of those taking only a single remedial course were still enrolled (Hoyt, 1999).

A study of 500 students taking remedial courses at a Florida community college indicated that, of those students who needed remediation in *both* reading and English, only 27% were still enrolled after three years. For those not requiring any remediation, 47% were still retained after three years (Grimes & David, 1999).

It seems fairly clear, therefore, that retention for students taking remedial courses is related to the *amount* of remediation required. This is true at both colleges and universities.

### Summary

The studies cited here indicate that contrary to claims of critics, taking remedial courses does not, necessarily, serve as a barrier to student success. The vast majority of students required to take remedial courses complete them within a year at both community colleges and universities. Those students who complete remedial courses at community colleges are likely to obtain grade point averages comparable to and sometimes better than those for whom remediation is not required. Furthermore, students taking remedial courses at community colleges are more likely to be retained and to graduate than students who are not required to participate in remediation.

The evidence from studies of those taking remedial courses at universities is mixed. Some report retention percentages for remedial students that are comparable to non-remedial students and some report higher percentages of retention for non-remedial students.

Finally, the evidence is clear that students with the highest need for remediation are least likely to graduate from either community colleges or universities. Students taking only one remedial course graduate about as often as students requiring no remediation. Students who require remediation in several content areas, however, face a high risk of attrition.

The available evidence suggests that taking remedial courses is, in general, more likely to facilitate success in college than to hinder it. Students who require a modest amount of remediation obtain grade point averages, pass regular curriculum courses, and are retained at rates comparable to students who do not require remediation. However, students who

require remediation in English and reading or in all three remedial subject areas, are considerably less likely to be successful in college.

According to a recent ACE study (Knopp, 1996) the majority of those enrolled in remediation take only one or two courses. Consequently, remediation may be considered to "work" for most of those who participate in it.

### Discussion and Conclusion

Research on the effectiveness of remedial courses is almost always based on the "average" course. Research does not distinguish between courses taught by experienced instructors and those taught by novices. It does not distinguish between those taught as part of the overall comprehensive developmental education effort and those taught independently of this effort. And, unfortunately, the teaching of remedial courses is not always part of an overall developmental education effort.

Frequently, remedial courses are not integrated with other campus developmental education activities. Frequently, the principles of adult learning and development are ignored entirely in the delivery of these courses. Frequently, there is no coordination of the efforts of those who teach remedial courses. Under such circumstances, remedial courses do **not** represent developmental education. They simply represent an adjunct curriculum delivered in a more or less random manner, generally on the margins of the institutional community.

Nevertheless, the research describing the aggregate results from all sorts of remedial courses - the best, the worst, and the average - still indicates that these courses help students become successful in college. This suggests that the debate over remedial courses may be cast in the wrong context.

The problem is not that some students need remediation. This is a given, historically and currently (Casazza, 1999). The problem is that all students who require remediation should expect to receive the best remediation we know how to deliver. But as long as many remedial courses are taught without regard to the principles of adult development and learning, as long as they lack coordination, and as long as they are disconnected from other campus support services, their participants will not be receiving the best remediation we are capable of delivering.

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*By Gypsy M. Derz  
Steven Pulos, Uni*

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## GRADUATE STUDENTS' APPROACHES TO LEARNING

By Gypsy M. Denzine, Northern Arizona University and  
Steven Pulos, University of Northern Colorado

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### Abstract

Some researchers, educators, and learning assistance professionals may implicitly assume that graduate students are competent, motivated, and highly skilled learners simply because of students' attained educational level. The assumption has yet to be empirically tested. This study extends the literature on learning processes by identifying the motives and learning strategies of Master's and Doctoral level students. Our results provide empirical evidence for what many of us have intuitively thought: some graduate students seem more like undergraduate students in terms of their motives and learning strategies. Students' academic competency cannot be assumed simply as a result of their progression through the educational system.

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### Introduction

Many of us who teach and provide learning assistance to graduate students can remember specific students who, regardless of their age and experience, remind us of undergraduate students in terms of their behavior and thinking processes. For example, it is not uncommon to hear graduate students ask their professor, "Will this be on the test?" We also see graduate students who answer essay questions by relying upon rote memorization of material and who have difficulty applying theoretical constructs to their every-day professional activities. Many of us have also experienced frustration during class discussions when we realize some students have not completed the required reading prior to class. As a final example, many of us have worked with graduate students who procrastinate and set minimal goals for the quality of their research papers. Clearly, such behaviors are not reflective of highly self-regulated, motivated, and skilled learners. Yet, there appears to be an implicit assumption in higher education that graduate students are highly motivated and skilled learners.

We reviewed the literature in the areas of adult learning, retention in higher education, and learning assistance centers and found the issue of graduate student learning to be a neglected topic. In using the key words "graduate student learning" in our search in ERIC and PsychLit from 1991 to the present we found only five references. The foci of these articles were related to language issues of graduate students who serve as teaching assistants; meeting the needs of graduate students with learning disabilities; and graduate students' interest and skills in conducting research. We found no empirical work on graduate student learning.

In addition to the lack of research, graduate student learning is a topic that has not received much attention among student services professionals. For example, in a recent New

Directions For Student Services volume titled "Student Services for the Changing Graduate Student Population" (Pruitt-Logan & Isaac, 1995) there is no mention of learning processes. In this book, there are chapters focusing on career services, counseling services, financial aid, housing, and advising. Missing from this work is any mention of learning assistance services for graduate students. Again, we see an implicit assumption that graduate students do not have learning assistance needs.

We speculate the lack of attention given to graduate student learning may be due in part to theorists' and service providers' assumption that students who make it as far as graduate school must have effective approaches to learning. Some educators may believe graduate students are competent learners simply as a result of the student's age and cognitive development. However, this issue has yet to be empirically addressed. This study extends the literature on learning processes by identifying the motives and learning strategies of Master's and Doctoral level students.

### Review of the Literature

Several adult learning theorists have suggested that adult learners are different from their younger counterparts (Knowles, 1990; Mezirow & Associates, 1990; Brookfield, 1987). According to Knowles, adults differ from younger students in two important ways: they are more independent and self-directed and they are motivated by more of an internal drive as opposed to the need for external praise and reinforcement. Additionally, adult learners tend to take responsibility for their own learning (Brookfield, 1987). Brookfield (1987) attributes some of the differences between adult and younger learners to the fact that participation in learning activities is most often voluntary for adult learners. The adult learning perspective suggests that graduate students should demonstrate a high level of motivation and self-directed learning because of natural maturational processes and the voluntary nature of graduate studies.

In the present study, 254 graduate students completed the Study Process Questionnaire (SPQ) (Biggs, 1987). The SPQ is a 42-item self-report instrument designed to measure a student's composite approach-to-learning including their motives (intrinsic and extrinsic) and strategies (ability to relate new content to prior knowledge, organizing work, rote learning). Biggs developed this instrument using factor analytic techniques to describe the learning and study approaches used by students within the context of teaching and learning. The SPQ is based on "motive-strategy congruence theory" (Biggs, 1978) and is conceptually very similar to Pintrich & DeGroot's (1990) "will and skill theory" of self-regulated learning.

According to Biggs (1993), the best learning situation is where there is congruence between a learner's motive and strategy. For instance, a student's motive answers the question "Why am I here" and their general strategy addresses "What am I going to do about it" (Biggs, 1987). When congruency between motive and strategy exist, students are more likely to engage in *meta-learning*. According to Biggs (1987), meta-learning is students' awareness of and control over their own learning processes. Meta-learning involves awareness of one's own motives, the task requirements, and a sense of whether or not their own strategies can

meet the task requirements, their motives and strategies combine to form a learning perspective with features of individuality.

Students' SPQ motives for learning can be described by a composite approach-to-learning meaning from his or her perspective what he or she achieves by with minimal essentials and effort to achieve high grades (1987), "surface" task itself, while temporal and spatial students to combine. Thus, a highly organized as a "surface-achievement" meaning of content learner.

Previous research on learning than traditional scores of 126 students collected at a large university occurred for: surface = 1,  $p < .05$ ). Old Gender difference approach more frequent (1988) claim that collaborative discussion their personal experience prior knowledge, that Dart's sample

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meet the task requirements. Students are unlikely to engage in meta-learning processes when their motives and strategies are not congruent. For example, students who use rote learning strategies combined with an intrinsic motive orientation are not likely to engage in meta-learning. Biggs (1993) emphasizes motives and strategies are modifiable contextual factors that exist within the domain of learning situations. He contrasts the approaches-to-learning perspective with the learning style's perspective, which refers to hypothesized built-in features of individual learners that are not sensitive to the context of learning.

Students' SPQ responses indicate the extent to which the learner endorses three basic motives for learning and three learning strategies. A student's "approach-to-learning" can be described by a composite of motive and strategy. Based on this composite, learners can be identified as having a *deep*, *surface*, and/or *achieving* approach-to-learning. A *deep* approach-to-learning is when the student is intrinsically motivated to extract the most meaning from his or her learning; he or she reads widely and tends to relate new content to what he or she already knows. A student who endorses a *surface* learning approach tends to get by with minimal effort, sets low academic goals, and is likely to focus on the bare essentials and engage in rote learning strategies. An *achieving* learner is motivated to achieve high grades and is likely to organize his or her time and work. According to Biggs (1987), "*surface* and *deep* strategies describe ways in which students engage in the actual task itself, while the *achieving* strategy describes the ways in which students organize the temporal and spatial contexts in which the task is carried out. It is therefore possible for students to combine an achieving approach with either a surface or a deep approach" (p. 3). Thus, a highly organized rote learner who is motivated to earn high grades may be classified as a "surface-achieving learner." A student who is widely read and tries to master the meaning of content in a systematic and organized way would be called a "deep-achieving" learner.

Previous research indicates adult learners are more likely to adopt a deep approach to learning than traditional age college students (Dart, 1998). Dart compared SPQ subscale scores of 126 students older than 25 to 306 students younger than 25. The sample was collected at a large metropolitan university in Australia. Significant univariate differences occurred for: surface approach ( $F = 4.48$ ;  $df = 1$ ,  $p < .05$ ); and deep approach ( $F = 11.50$ ,  $df = 1$ ,  $p < .05$ ). Older students used deep approaches more frequently than younger students. Gender differences within both groups revealed that males adopted a surface learning approach more frequently than females. Dart interprets these results in support of Tarule's (1988) claim that females may have preferences for 'connected' learning strategies, such as collaborative discussion and the integration of personal experiences. When students share their personal experiences they are more likely to connect new learning material to their prior knowledge, which fits the profile of a deep learner. It is relevant to our study to note that Dart's sample contained all undergraduate students.

In summary, the issue of graduate student learning has received little attention among educational researchers. While we would hope and expect the majority of graduate students to be deep-achieving learners, there is a need to address this hypothesis empirically.

## Methodology

### Research Site

All data was collected at a coeducational, public university located in the Rocky Mountain region. The institution has a graduate enrollment of 1,713 students.

### Sample

The Study Process Questionnaire (SPQ) (Biggs, 1987) was completed by 175 Master's degree candidates and 79 Doctoral candidates. The Master's degree group was 72% female and the average age was 28.7. The Doctoral group was 62% female and the average age was 36.4.

Participants were recruited from a wide variety of classes and the SPQ was administered in education, statistics, and research methods classes. The majority of students (72%) were pursuing degrees within the field of education. The sample also contained students who were seeking graduate degrees in physical sciences (12%), sport administration (8%), nursing (5%), and mathematics (3%). No participants were paid or given class credit for their participation in this research project.

### Research Questions

This study was designed to address four primary research questions:

1. What are the motivation and strategy profiles of graduate students?
2. Is there a difference in approaches to learning between Master's and Doctoral degree seeking students?
3. Are there gender differences in graduate students' approaches to learning?
4. Is there congruence between graduate students' motives and strategies?

### Instrument

Several investigations of the reliability of the SPQ indicate that the internal consistency of the SPQ subscale scores is adequate (Cronbach alpha coefficients for the subscales range from .55 to .85; Biggs, 1987). There are six subscales: three measure students' motives for studying (surface-SM, deep-DM, achieving-AM); and three measure the learning strategies used by students (surface-SS, deep-DS, and achieving-AS). Evidence for the validity of the test comes from results of item analyses and the interpretation of the internal structure derived from factor analytic investigations. The factorial validity of the SPQ support Biggs' model of the approach-to-learning domain (Andrews, et al., 1994; Hattie & Watkins, 1981).

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## Results

Because the SPQ was originally developed for an undergraduate population, it is necessary to first address the psychometric properties of the SPQ for this sample.

### Reliability and Validity

The internal consistency reliability coefficients (Cronbach's alpha) for each of the subscales are in concordance with other research (Andrews, et al., 1994; Hattie & Watkins, 1981). For this sample, the coefficients are all in the adequate to good range (SM = .61, SS = .71, DM = .66, DS = .76, SM = .71, AS = .76). Construct validity of the SPQ for this sample was established by interpreting the results from an exploratory principal component analysis. The eigenvalue greater than one rule and a visual examination of the scree plot were the criteria used to extract the factors. Based on these criteria, three factors were interpreted which accounted for 34% of the total variance in the data. Overall, the three-factor solution is consistent with Biggs' (1987) model of *deep*, *achieving*, and *surface* approaches to learning; however, there were a few achieving items that cross-loaded on the two other factors. For example, the item "One of the most important considerations in choosing a course is whether or not I will be able to get top marks on it" had a .61 loading (varimax rotation) on the surface factor. Also, the item "I have a strong desire to excel in all my studies" did not have a high loading on the achieving factor (.07), which is inconsistent with Biggs' work. This item loaded (.40) on the deep learning factor for this sample.

In summary, the reliability and validity measures of the SPQ for this sample are adequate. Next, the results from this study are presented in relation to the four research questions previously mentioned.

### Graduate Students' Approaches to Learning

SPQ items are rated by respondents on a five-point Likert scale (4 = always or almost always true of me, 1 = never or only rarely true of me). The means and standard deviations for select SPQ items are reported in Table 1.

Table 1. Means and Standard Deviations for Select SPQ Items

Item #	Item	Masters	Doctoral
1	I chose my present courses largely with a view to the job situation when I graduate rather than out of their intrinsic interest to me. (SM)	2.40 (1.22)	3.09 (1.28)
2	I find that at times studying gives me a feeling of deep personal satisfaction. (DM)	2.41 (1.01)	2.10 (.81)
6	I summarize suggested readings and include these as part of my notes on a topic. (AS)	3.45 (1.10)	2.95 (1.31)
7	I am discouraged by a poor mark on a test and worry about how I will do on the next test. (SM)	2.21 (1.30)	2.51 (1.38)
8	While I realize that truth is forever changing as knowledge is increasing, I feel compelled to discover what appears to me to be the truth at this time. (DM)	2.50 (1.18)	2.13 (.99)

Item #	Item	Masters	Doctoral
9	I have a strong desire to excel in my studies. (AM)	1.58 (.86)	1.48 (.85)
10	I learn some things by rote, going over and over them until I know them by heart. (SS)	2.46 (1.07)	3.05 (1.12)
13	Whether I like it or not, I can see that further education is for me a good way to get a well-paid or secure job. (SM)	1.87 (1.03)	2.34 (1.19)
19	Even when I have studied hard for a test, I worry that I may not be able to do well in it. (SM)	2.56 (1.25)	2.58 (1.33)
20	I find that studying academic topics can at times be as exciting as a good novel or movie. (DM)	2.53 (1.15)	2.03 (1.00)
22	I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra. (SS)	3.31 (.89)	3.71 (1.03)
23	I try to relate what I have learned in one subject to that in another. (DS)	1.68 (.66)	1.70 (.81)
25	Lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined. (SM)	3.16 (1.18)	3.47 (1.16)
26	I usually become increasingly absorbed in my work the more I do. (DM)	1.97 (.79)	1.89 (.97)
32	I see getting high grades as a kind of competitive game, and I play it to win. (AM)	2.88 (1.32)	3.20 (1.41)
34	I find it best to accept the statements and ideas of my lecturers and question them only under special circumstances. (SS)	3.66 (.97)	3.70 (1.22)
37	I am at college/university mainly because I feel that I will be able to obtain a better job if I have a college education. (SM)	2.42 (1.22)	3.04 (1.49)
38	My studies have changed my views about such things as politics, my religion, and my philosophy of life. (DM)	3.05 (1.38)	2.52 (1.48)
41	I try to relate new material, as I am reading it, to what I already know on that topic. (DS)	1.59 (.66)	1.73 (.86)

From these sample items, we see there are meaningful differences in Master's and Doctoral students in terms of both motivation and strategy. For example, Master's students are more likely to select courses with a view to the job market rather than out of their intrinsic interest (Item 1). Means on Item 37 indicate Doctoral students are more likely to have changed their own values and philosophy of life as a result of their studies compared to Master's students. In terms of strategy knowledge and use, we see that Master's students are less likely to summarize their readings (Item 6) and more likely to learn some things by rote memorization (Item 10) compared to Doctoral students. The standard deviations for the individual items also present some interest findings. For instance, the standard deviation of 1.33 for Doctoral students on Item 19 ("Even when I have studied hard for a test, I worry that I may not be able to do well in it") is just one example of the amount of variability that exists within the Doctoral group.

Because SPQ norms do not exist for graduate students, we compared our results to Biggs' (1987) published norms for 202 Australian undergraduate education majors. The means for the six subscales from the undergraduate normative sample are SM=21.42, SS=19.65, DM=23.5, DS=22.62, AM= 18.51, and AS=20.07. In comparing these undergraduate norms to our Doctoral sample shown in Table 2 we see that more Doctoral students engage in deep

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1.70 (.81)
3.47 (1.16)
1.89 (.97)
3.20 (1.41)
3.70 (1.22)
3.04 (1.49)
2.52 (1.48)
1.73 (.86)

Master's and Doctoral students are more likely to have changed their intrinsic interest than Master's students. Master's students are less likely to learn things by rote than Doctoral students. Standard deviations for the items are shown in parentheses. For a test, I worry about variability that

our results to Biggs' findings. The means for the items are 21.42, SS=19.65, and the undergraduate norms are 21.42, SS=19.65. Students engage in deep

approaches to learning (both motivation and strategy) than undergraduate students. The subscale distributions for achieving motivation and strategy are very similar for the graduate and undergraduate samples. In comparing our Master's sample shown in Table 2 to the Biggs' (1987) undergraduate sample we see very similar patterns of learning. In terms of motives and strategies, our Master's sample closely resembles the learning composites of undergraduate education majors in Australia. The means for the *surface motive* subscale were 21.4 and 18.0 for the undergraduate and graduate samples, respectively. The possible range for this subscale is 7-35, low scores are interpreted as having more of a *surface motive* approach. We had more graduate students with a *surface motive* orientation compared to the undergraduate sample. Twenty-six percent of the Master's group had a *surface motive* score of 15 or below. In further analysis, we explored subscale scores using a within-student technique. For each student we looked at his or her predominate approach to learning (i.e., lowest subscale score). The percentages in Table 2 represent students' primary motivation and strategy approach. For example, 21% of male Master's students can best be characterized as having a surface motivation orientation.

Table 2. SPQ Subscale Means, Standard Deviations, and Percentage of Students With Predominant Approach-to-Learning

Subscale	Masters Students		Doctoral Students	
	Female	Male	Female	Male
Deep Motive	17.71 (4.49) 37%	16.97 (4.52) 20%	15.43 (4.31) 37%	15.93 (4.08) 36%
Deep Strategy	15.77 (3.57) 34%	16.64 (3.90) 35%	15.37 (4.50) 41%	15.83 (4.14) 34%
Achievement Motive	19.11 (4.35) 7%	17.04 (5.26) 12%	19.47 (5.53) 7%	18.93 (5.55) 6%
Achievement Strategy	19.34 (4.58) 6%	20.24 (6.00) 7%	18.63 (5.94) 8%	19.47 (5.37) 9%
Surface Motive	18.04 (3.81) 13%	17.68 (5.81) 21%	21.63 (4.62) 5%	19.20 (4.98) 13%
Surface Strategy	22.43 (3.62) 3%	19.72 (4.94) 5%	23.94 (4.81) 2%	23.23 (4.75) 2%

An analysis of the frequency distribution of each item revealed some interesting findings. For example, 18% of this sample strongly believed that "instructors shouldn't expect students to spend significant amounts of time studying materials everyone knows won't be examined" (Item 24). Fifteen percent said they never or only rarely become increasingly involved in their work the more they do (Item 25). A final example of a surface approach can be interpreted by the finding that 48% report they sometimes or never related new material to what they already know on that topic (Item 40). In review, surface learners are motivated to meet minimal requirements and target their reading to bare essentials. In addition to having a *surface motive* orientation, about half of these learners also rely upon

*achievement strategy* as indicated by their desire to organize their time and space for academic success.

### **Master's Versus Doctoral Students**

Several t-tests were conducted to compare the mean differences between Master's and Doctoral students in their approaches to learning. Due to the inter-relatedness of the subscales, we analyzed only a limited number of differences between subscale means, and alpha levels were set a priori at .01 to control for family Type I errors.

In total, four t-tests were computed to test mean differences in SPQ subscales between Master's and Doctoral students. First, a two-tailed independent t-test revealed that the difference between the means on the *deep motive* subscale was statistically significant ( $t = 6.6$ ,  $df = 266$ ,  $p < .01$ ) meaning that Doctoral students had a higher level of *deep motive* compared to Master's students. Second, t-test results revealed the difference between means on the *surface motive* subscale was statistically significant ( $t = 5.77$ ,  $df = 248$ ,  $p < .01$ ) meaning that Master's students had higher levels of *surface motive* than Doctoral students. A third t-test showed that there was no significant difference between the means for the *deep strategy* subscale for Master's and Doctoral students ( $t = .67$ ,  $df = 248$ ,  $p > .01$ ). Finally, t-test results indicated no significant difference between the means for the *surface strategy* subscale for Master's and Doctoral students ( $t = .31$ ,  $df = 248$ ,  $p > .01$ ).

### **Gender Differences**

Several non-directional hypotheses were tested within the Master's and Doctoral groups to examine gender differences. After analyzing the descriptive statistics from the SPQ results, we determined there were several post hoc gender comparisons worthy of investigation. For Doctoral students, a two-tailed independent t-test revealed that the difference between the *surface motive* subscale means was statistically significant ( $t = 2.07$ ,  $df = 77$ ,  $p < .05$ ) meaning more male Doctoral students relied upon *surface motive* compared to female Doctoral students.

In total, three t-tests were computed between subscales (alpha levels were set a priori at .01) to test for gender differences in Master's students. The results from these t-tests revealed there were no significant differences between male and female Master's students on the *deep strategy* ( $t = .54$ ,  $df = 173$ ,  $p > .01$ ), *achievement motive* ( $t = 1.16$ ,  $df = 173$ ,  $p > .01$ ), or *achievement strategy* ( $t = .63$ ,  $df = 173$ ,  $p > .01$ ) subscales.

### **Motive-Strategy Congruence**

The zero order correlations among motivation and strategy presented in Table 3 provide evidence of congruency. In fact, all correlations between motive and strategy were statistically significant.

Table 3

Deep Motive
Deep Strategy
Achievement Motive
Achievement Strategy
Surface Motive
Surface Strategy

\*  $p < .05$

The results of the deep and surface motive and strategy scales upon a sample of graduate students.

The primary strategy used by graduate students to those of the learning independent variable.

Our results indicate that graduate students engage in learning upon a sample of research students.

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Table 3. Pearson Correlation Coefficients for SPQ Subscales

	Deep		Achieve.		Surface	
	Motive	Strategy	Motive	Strategy	Motive	Strategy
Deep Motive						
Deep Strategy	.60 (.00)*					
Achieve. Motive	.22 (.00)*	.14 (.02)*				
Achieve. Strategy	.40 (.00)*	.54 (.00)*	.29 (.00)*			
Surface Motive	-.07 (.26)	-.14 (.02)*	.40 (.00)*	.13 (.03)*		
Surface Strategy	-.11 (.07)	-.17 (.00)*	.46 (.00)*	.19 (.00)*	.57 (.00)*	

\*  $p < .05$

### Discussion

The results from this study indicate that while the majority of graduate students rely upon deep and achieving approaches to learning, approximately 20% of graduate students rely upon a surface approach-to-learning.

The primary differences between Master's and Doctoral students are motivational rather than strategy use. In many cases, Master's degree students have approaches to learning similar to those of undergraduate and even high school students. These findings conflict with adult learning theorists who suggest age and experience will lead towards self-directed, independent, and intrinsically motivated students.

Our results are consistent with Dart's (1998) findings that adult males are more likely to engage in surface learning strategies. It is of interest that more male Doctoral students rely upon a *surface motive* orientation than female Doctoral students. There is a need for further research to address the issue of gender difference in motivation among Doctoral students.

There are several aspects of this study that limit the generalizability of our findings to the graduate student population. First, the majority of participants in this study were full-time graduate students enrolled in an education-related degree program. It may be inappropriate to generalize our findings to part-time students, students from disciplines other than social sciences, or individuals that might be classified as distance education students. Finally, the data collected for the present study was collected from doctoral students attending a comprehensive institution. Therefore, we cannot assume our findings would generalize to students attending universities that place heavy emphasis on research activities.

### Implications for Learning Assistance Centers

These findings have implications for learning assistance providers and developmental educators who typically focus their programs and services towards undergraduate students (Casazza & Silverman, 1996; Miller, 1996; Simpson, et al., 1997). Our results suggest a significant number of both Master's and Doctoral students could benefit from learning assistance center services for several reasons. First, graduate students frequently balance many job, academic, and family responsibilities. Similar to undergraduate students, graduate students can benefit from acquiring more time efficient learning strategies. Second, we suggest the extension of academic services for graduate students can also be justified based on the need to ensure that specific learning outcomes are being achieved. No longer is it acceptable in higher education to equate academic success with GPA and graduation rate data. We are now pressed to provide evidence that demonstrates students are competent in specific knowledge and skill areas. Previous research on undergraduates (Biggs & Collis, 1982; Entwistle & Marton, 1994; Gow & Kember, 1993) shows that when students engage in deep learning strategies, higher learning outcomes are achieved. A third reason for extending services to graduate students is related to faculty motivation. It is not uncommon to hear faculty frustrated by students who approach learning situations with a surface orientation. For example, to hear graduate students continually ask "will this be on the exam" can wear on the teaching motivation of some faculty. By helping graduate students adopt motives related to learning rather than performance, learning assistance center professionals may be improving the teaching climate for graduate faculty.

Although graduate students may benefit from learning assistance center programs and services, in practice it may be difficult to reach this population for several reasons. First, unlike their undergraduate counterparts, graduate students typically do not attend extensive new student orientation programs. Hence, there is a missed opportunity to educate new graduate students about learning assistance center activities. Second, even when programs and services are advertised, graduate students may be reluctant to attend because they have come to believe they are competent learners and do not need such services. Because of their past academic success, graduate students may have an increased sense of confidence in their learning approaches and may resist change. Moreover, graduate students who do seek assistance may resist changing their current approaches to learning. The learning strategies of graduate students may be very difficult to change because, to some extent, their previous habits have been successful. Hofer, Yu, & Pintrich (1998) remind us that post-secondary students develop an implicit theory of learning, which makes it difficult to change their strategy knowledge and choice.

Given our results, we offer three suggestions for learning assistance center providers. First, we agree with Simpson, et al.'s., recommendation (1997) that the focus of an intervention model include both cognitive and motivational components of learning. Given our results, strategy intervention appears to be especially important for male graduate students. Intervention models targeted towards Master's students should place heavy emphasis on motivation components, including (a) adaptive attributional beliefs, (b) self-efficacy beliefs, (c) beliefs that effort will lead to increased success, and (d) tools for setting effective academic goals (Alderman, 1999). Focusing on the skills and strategies of individual

students is consistent with the idea that it is possible to improve the situation. They can help their learning process and students to become more congruency found in congruency facilitation.

Our second recommendation is to be more authentic and unwilling to attend to the situation. For example, they may use "anxiety tips," or "be prepared" titled "preparing for writing an outline process," and "making

Finally, we suggest that faculty development should hold the misconception that Graduate faculty can encourage students to on self-regulated learning. Instructors can assist in becoming more reflective of how he promotes graduate statistics class. Mezirow's (1990) theory to engage adult learning approaches. From the situation rather than the (1988) argue the best students perceive it is focusing on the situation is to place equal emphasis on instruction).

In conclusion, this study thought: some graduate assume students' academic educational system. To on both the individual assistance center program marketing materials to



students is consistent with the work of Schmeck (1988) and Weinstein (1988). They believe it is possible to improve student learning by developing the individual's skills regardless of the situation. They also emphasize the importance of increasing students' self-awareness of their learning processes. Our results provide an optimistic view of encouraging graduate students to become aware of their own learning approaches. This optimism is due to the congruency found among students' motives and strategies. According to Biggs (1987), congruency facilitates greater self-awareness within the individual.

Our second recommendation is that learning assistance programs and workshops may need to be more authentic to the experiences of graduate students. Graduate students may be unwilling to attend programs they perceive to be targeted for an undergraduate audience. For example, they may resist attending workshops titled "study skills improvement," "test anxiety tips," or "becoming a strategic learner." They may be more likely to attend sessions titled "preparing for written and oral comprehensive examinations," "reading comprehension for writing an outstanding thesis," "how deep learning strategies can ease the dissertation process," and "making the learning transition to Doctoral level work."

Finally, we suggest there is a need for learning assistance staff to play a central role in faculty development, especially for graduate faculty. As noted earlier, some educators may hold the misconception that all graduate students are highly motivated and skilled learners. Graduate faculty can be instrumental in designing their curriculum and instruction to encourage students to engage in deep learning strategies. In their most recent edited book on self-regulated learning, Schunk & Zimmerman (1998) provide many examples of how instructors can assist learners in setting academic goals, monitoring their own behavior, and becoming more reflective learners. In this volume, Lan (1998) provides a useful example of how he promotes self-monitoring, self-regulation, and self-reflection among students in graduate statistics classes. Encouraging students to become more reflective is supported by Mezirow's (1990) theory of transformative learning. He argues that it is especially important to engage adult learners in reflective activities and to utilize cooperative learning approaches. From this perspective, efforts to improve student learning are focused on the situation rather than the motivation and skills of the individual. Entwistle (1988) and Marton (1988) argue the best way to improve education is to change the learning situation so that students perceive it differently. We believe educators should not have to choose between focusing on the situation and the learner. Perhaps, the best way to focus on student learning is to place equal emphasis on the individual (will and skill) and the situation (curriculum and instruction).

In conclusion, this study provides empirical evidence for what many of us have intuitively thought: some graduate students seem more like undergraduate students. We can no longer assume students' academic competency simply as a result of their progression through the educational system. To improve graduate student learning, we believe it is important to focus on both the individual and the situation. Finally, there may be a need for university learning assistance center providers to revisit their mission statement, outreach programs, and marketing materials to ensure they address the needs of graduate students.

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By Martha E. C.

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