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ABSTRACT

The academic performance and learning strategy use of students in a freshman history course at a large southeastern U.S. regional university is the focus of this study. One group of students was comprised of first-term, at-risk students who were jointly enrolled in a learning support reading course and the freshman history course. The second group of students was comprised of the remaining students in the history course, some of whom had previously completed other college courses. No statistically significant differences on test scores or final grades in the history course were revealed. However, strategy engagement trends were implicated between the two groups of students. Findings are congruent with research that has shown the viability of linking non-credit reading courses for at-risk students with social science credit courses in college. Contains 7 tables of data, 27 references, and a student pre-questionnaire. (BT)

Linked Instruction: The Contextual Acquisition of Learning Strategies in a University History Course

A ROUND TABLE PRESENTATION

AMERICAN EDUCATIONAL RESEARCH ASSOCIATION ANNUAL MEETING APRIL 16, 1998 SAN DIEGO, CA

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Abstract

This research examined the academic performance and learning strategy use of students in a freshman history course at a large southeastern United States regional university. One group of participants, referred to as Linked students, comprised first-term, at-risk students who were jointly enrolled in a Learning Support reading course and the freshman history course. The second group of participating students, referred to as Comparison students, comprised the remaining students in the same history course, some of whom had previously completed numerous other college courses. No statistically significant differences on test scores or final grades in the history course were revealed; however, strategy engagement trends were implicated between the two groups of students. Findings are congruent with research that has shown the viability of linking non-credit reading courses for at-risk students with social science, credit courses in college.

Linked Instruction: The Contextual Acquisition of Learning Strategies in a University History Course

Current research suggests that many entering college students lack the advanced literacy skills necessary for the rigors of their academic courses (Thomas, Bol, & Warkentin, 1991). In response to the academic needs of students identified as at-risk for successfully completing college, institutions of higher education have created support courses designed to teach students a variety of learning and motivational strategies for directing and controlling their own learning. The general intention of these institutional efforts is not to teach students how to perform specific learning strategies within a narrow context of application, but rather to assure that students acquire strategies for learning in college which they can transfer, apply and adapt to a range of learning contexts (McKeachie, Pintrich, & Lin, 1985). Linking a reading support course with a content area course has been shown to be an effective approach to directly assisting at-risk students and for teaching transferable learning strategies within content-specific settings (Dimon, 1988; Keimig, 1983; Stratton, Commander, Callahan, & Smith, 1996).

Theoretical Framework

Strategic learners successfully negotiate college learning tasks by selecting the most appropriate learning strategy. Thus, in order to employ the most appropriate learning strategy, the student must possess a repertoire of transferable learning strategies as well as a thorough knowledge of the task (Simpson & Nist, 1992; Alexander & Judy, 1988). Linked classes assist the student in both areas.

Research reveals the components of instruction needed to successfully promote strategy transfer (Gaskins, 1994; Hattie, Biggs, & Purdie, 1996; Gagne, 1985; Pressley & Ghatala, 1990). Two promising components have been identified. First, strategy instruction should be embedded as much as possible into the content of the transfer course (Hattie, et. al., 1996). According to this view, strategy instruction must be closely linked to the teaching of content and to the performance of authentic course tasks and assignments. This view contrasts with the view that strategy instruction can be effective when it is taught separately from the context of the students' transfer course. When strategy instruction occurs in detached, unrelated contexts, students are less likely to transfer strategies in task-appropriate ways. Effective strategy instruction, therefore, should be situated preferably within meaningful contexts and linked to the content of the transfer situation. Such contextualized learning is purposeful and functional for students (Brown, Collins, & Duguid, 1989).

Effective strategy transfer instruction should also include metacognitive awareness training which involves instruction not only in how to perform a particular strategy but when, where and why to use that strategy (Brown, Campione, & Day, 1981; Dansereau, 1985; Paris, Lipson, & Wixson, 1983). Metacognitive awareness is promoted as students (a) monitor and regulate strategies in task-appropriate ways (Pressley & Ghatala, 1990); (b) evaluate the effectiveness of strategies (Gagne, Yekovich, & Yekovich, 1993); and (c) construct rationales explaining the usefulness of those strategies (Schunk & Gunn, 1986). Metacognitive awareness is also facilitated when the goals of learning are embedded within an authentic context (Brown, et. al., 1989; Bransford, Sherwood, Vye, & Rieser, 1986). Such conditions foster goal-checking, self-corrective activity, and self-evaluation of strategic effectiveness. Training that involves metacognitive awareness enables students to abstract general principles from their experience with particular strategies and generalize that knowledge to new situations (Pressley & Ghatala, 1990; Perkins & Salomon, 1989). As a result, students build a conceptual understanding of themselves as strategic learners

(Pressley & McCormick, 1995). This view is consistent with several theoretical frameworks of learning and transfer, such as situated cognition (Brown, et. al., 1989; Bransford, et. al., 1986); transfer-appropriate processing (Morris, Bransford & Franks, 1977); process-component approaches (Thomas & Rohwer, 1993); a systems view of learning (Biggs, 1993): and informed strategy training (Gagne, et. al., 1993). According to these views, transfer is more likely when learning conditions are congruent with the transfer conditions.

Purpose

The purpose of the present study was to investigate the academic performance and learning strategy use of at-risk college freshmen in a history course at a large southeastern regional university in the United States. Learning strategies were taught within the context of the freshman history course. According to this linked-instruction teaching model, strategy training was intertwined with the acquisition of specific content and the required tasks within the history course. Thus, the teaching objective was for the at-risk students to acquire learning strategies as functional and adaptive responses to the history course requirements.

Method

Participants

Nineteen Learning Support students volunteered to enroll in History 153, Western Civilization, and the strategy-instruction (reading) course concurrently. Three of the Learning Support students dropped the history course prior to the "last day to drop." They were placed in a non-linked Learning Support reading class and considered as dropouts from the study. Learning Support reading students at this institution are defined as entering freshman whose SAT scores or high school GPAs are below the regular university admissions criteria. These students are required to enroll in and complete a non-credit preparatory course designed to help them succeed in their regular academic courses. In the present study these concurrently enrolled reading students are referred as Linked-students.

An additional 43 students enrolled in the same History 153 course but not enrolled in Learning Support also volunteered to participate in the study. These students served as a comparison group comprising three subgroups: (a) regularly admitted freshman students (i.e., entering freshmen students who met the university admission requirements for SAT and high school GPA); (b) former Learning Support (LS) students who had successfully completed an LS required reading course sequence; (c) regularly-admitted upper-level students (i.e., students who had completed more than 45 hrs of college course work). Collectively these students are referred to as Comparison students. Analyses using SAT verbal scores revealed that Linked-students' mean of 439 (sd. = 21) was significantly lower than the Comparison students' mean of 473 (sd. = 71) ($t = -2.74$, $df = 55$, $p < .01$). Similar analyses using high school GPAs revealed that Linked-students' mean GPA (2.65, sd. =.46) was significantly lower than the Comparison students' mean GPA (3.04,sd = .53) ($t = -2.595$, $df = 55$, $p < .05$). The average age of all participating students was 19.6 years. Demographics for the participating students are shown in Table 1.

Procedures

In order to offer the Linked-strategy instruction course, agreements were obtained between participating professors (History 153 and Learning Support) and department chairs. University advisors

then asked Learning Support students to voluntarily enroll in the Linked-strategy instruction and History 153 courses concurrently. Linked-students attended the History 153 course in the morning and the Linked-strategy instruction class in the afternoon each day. Both Linked-students and Comparison students were treated exactly the same in the History 153 course --all students were required to complete the same course assignments and meet the same criteria for grades. However, Linked-students received additional instruction in reading and study strategies (in the Linked-strategy course) specifically tailored to the task analysis of assignments and test preparation activities of the History 153 course. At the end of the academic term, all students were asked to provide self-reports of engagement in study strategies, class preparation and test preparation activities used in History 153. Students' self-reported engagement in strategies were analyzed along with their achievement scores on three unit exams, a final exam, a map quiz, and final grade.

Instrument

A researcher-created instrument was used to assess students' engagement in particular self-directed strategies and self-management activities. The self-report instrument was administered to students in their History 153 classroom at the beginning of the academic term and again at the end. The first three questions focused on students' study time and class preparation activities. The first question asked, "How much time do you usually spend preparing for the History 153 exam?" Students marked their responses by checking the number of hours (1, 2, 3, 4, or more). The second and third questions asked, "Do you prepare for class by reading the assigned materials?" and "Do you review and integrate class lectures with text notes." Students responded to these questions using a 5-point Likert scale (1 = Not very well, to 5 = Very well). The fourth and fifth questions focused on students' test preparation activities. Students were asked, "Do you organize materials for possible essay questions?" and "When you study to remember specific terms, do you use who, what, when, where and significance questions to guide your study?" Students responded to these questions using a 5-point Likert scale (1 = Not much, to 5 = Very much). The last question included a checklist of 14 specific learning/study strategies along with short definitions or descriptions for each strategy. Students were asked to check those strategies which they most frequently used or found most helpful while studying for History 153. These strategies included text comprehension strategies (e.g., Underlining text; Annotating text margins); organizing strategies (e.g., Mapping; Outlining; Charting; Constructing time lines); note taking strategies (e.g., Taking notes on lecture, text and outside readings; Editing notes after class); strategies to prepare for essay exams (e.g., Writing answers to questions on study guide; Organizing materials for essay questions); remembering strategies (e.g., Drilling with flash cards; Memory techniques); self-testing strategies; social discussion strategies (e.g., Participating in study group); other strategies; and no strategies. See appendix for copies of the pre- and post- student questionnaire(s).

Linked-Course Model

History 153 Course. The History 153 course was organized so as to encourage students to plan and to be prepared for class lectures by reading assignments before coming to class. For example, students were provided with a detailed course syllabus that listed each session date, lecture topic and corresponding text pages covered. Students were expected to read approximately 50-60 pages a week in their texts (which were clearly indicated in the syllabus). In addition, the professor provided a detailed study guide prior to each of the four exams consisting of (a) a long list of concepts/terms which students were expected to know for the exam and (b) approximately eight essay questions, two of which would be randomly selected

to be on the exam. Each unit exam consisted of 15-20 multiple choice or matching questions and two essay questions with approximately 70-80 percent of each exam grade dependent on the essay responses. The essay questions required students to integrate and synthesize large portions of lecture and text information into a coherent composition. The exams were 50 minutes (one class session) except for the final which was two hours. Texts used in the History 153 course included: Western Civilization: A Brief History, 2nd Ed., Volume II: From the 1400s (Perry, 1994); Great Issues in Modern History (Egger & Thomas, 1995); and a map of Europe (Europe, #24002). Class lectures and textbook readings were salient components of the course. Lectures involved a presentation of historical concepts, persons and social movements, and were delivered in an interesting, story-like manner. The professor recommended that students consider history as a story involving related events and critical outcomes. Each lecture was preceded with an outline of the day's lecture on the chalkboard. Students were encouraged to attend class regularly and promptly and to prepare for each class session by completing the assigned readings prior to the class session. Current events were often discussed in relationship to the historical origins and evolution of political ideologies. Small-group discussion sessions were rare (observed approximately three times during the term).

Linked-strategy instruction course. Strategy instruction courses often teach strategies as decontextualized skills, separate from the context or content in which students will eventually employ them. The assumption is that the strategies students learn will be functional in other academic courses and that students will transfer or adapt the strategies to other courses appropriately. However, for many students, especially academically at-risk students, these assumptions are difficult to support with evidence. The challenge is often too great for many students to maintain, adapt, and transfer strategies acquired within one context (or content) to another context which has very different goals, requirements, and expectations. Therefore, the approach taken in Linked-strategy instruction is to teach strategies as purposeful, goal-oriented responses to the negotiation of tasks. In addition, strategy instruction supports students' experience in meaningful contexts as students become aware of how and when to use strategies to accomplish particular goals. Effective strategy instruction also helps students understand the reason for using strategies within various course contexts. The Linked-strategy instruction in the present study attempted to embed strategy training within the context of an authentic course thus providing students with a scaffold to support intelligent acquisition of self-regulated strategies and to facilitate the transferability and adaptability of strategies to other contexts. Thus, the Linked-strategy instruction course consisted of a collage of techniques for students, all embedded within the ongoing context of History 153. Specific techniques to teach strategies included direct explanations of how to perform a strategy, demonstrations and modeling of when and why study strategies should be used in the History course, guided practice with feedback as students practiced strategies using History 153 materials and assignments, and whole-class and small-group discussion and evaluation of strategy implementation and effectiveness. In the present situation, for example, we knew that many Learning Support students were not effectively using reading comprehension monitoring strategies. Therefore, Linked-strategy instruction focused on this skill by teaching students how to check their comprehension of the material by annotating (in the margins of their History textbook) while reading assignments. The instructor demonstrated how to annotate (write personal elaborations, explanations, examples, and self-questions) while reading and explained when and why the strategy was helpful (to make information more meaningful and distinctive). Students then practiced performing the strategy themselves either with peers or alone and were provided with feedback. Students also engaged in class discussions and peer dialogue regarding the effectiveness of strategies (e.g., after receiving their results on an exam in History). Students were encouraged to discuss difficulties they experienced in implementing strategies, to evaluate the effectiveness of a strategy, and to suggest ways to improve or modify a strategy to increase its effectiveness in the future. Students also learned strategies to

help them regulate their approach to preparing for the exam. For example, since essay responses were heavily weighted on the exams, students were provided with explicit modeling of a strategy for analyzing essay questions and writing responses. Students were taught how to analyze essay questions by constructing visual aids (i.e., to create charts, matrixes, or maps) to make sure that they understood the question (precisely and thoroughly), and then to use the visual aid as a guide to write their essay responses accordingly. Students also discussed whether this strategy was effective or not and how to improve or adapt it in the future. Other strategies included taking notes on the lecture and editing these notes by rewriting, revising, and integrating with additional text material.

As a participant-observer, the researcher attended the history class daily, listened to lectures and took notes, read and studied all assigned readings according to the schedule, prepared for and completed all test requirements, and observed interactions between the professor and students. The knowledge gained from this course analysis enabled the researcher to identify course-effective strategies and accompanying metacognitive knowledge --knowledge of how, when and where to apply strategies. In sum, the researcher analyzed course tasks and requirements, and constructed appropriate strategies along with rationales regarding why the strategies were effective. With the knowledge gained from the participant-observation, the researcher was able to perform a major goal of Linked-instruction: to provide instructional support of students' acquisition of appropriate strategies. For example, in Linked-instruction, students were taught strategies such as (a) how to elaborate concepts while reading their history textbook, (b) how to annotate their texts to elaborate important concepts, (c) how to take notes, (d) how to set proximal goals for test preparation, and (e) how to regulate time. All of these strategies were embedded within the content and contextual tasks of the History 153 course. In addition, the instructor was able to model strategies relevant to the History course and to provide direct explanations of strategy use in meaningful situations. Students also discussed with their peers why they used a particular strategy and the results of using that strategy.

Data analysis

Data analyses compared the Linked students' and the Comparison students' self-report responses and gain scores on the strategy questionnaire instrument. Correlation analysis was used where appropriate to examine the relationship of students' strategy engagements to grades earned in the history course. In addition, students' scores on history exams were compared. History exams included a map quiz, three unit exams, and a final exam. The final grades in the History 153 course were also compared. Follow-up analyses were used to help the researchers investigate significant differences between subgroups of students in the history course. Analysis of variance procedures were used to analyze performance means of student subgroup scores and grades.

Results

Student Post-Questionnaire – Engagement in Learning Strategies

Time. Students' reports of time spent preparing for the History 153 exam are presented in Table 2. As can be seen, all students averaged 3.73 hours of study time. There were no statistical differences between Linked-students' average hours (3.53) and the Comparison students' average hours (3.79).

Routine reading and note-taking activities. Table 2 shows students' average endorsement to the study activity, "Do you prepare for class by reading the assigned materials?" Students' average score on a 5-point Likert scale was 2.75. No statistical difference was found between Linked-students' and Comparison students' scores. On the whole, this is a weak endorsement and suggests no widespread

engagement on the part of these students in a regular regimen of reading assignments before class sessions. Table 2 also shows students' average endorsement of the activity, "Review and integrate class lecture and text notes." Students' average score on a 5-point Likert scale is 3.30. No statistical difference was observed between Linked-students' and Comparison students' average score. This score also suggests only moderate engagement in study activities aimed at synthesizing information obtained from different sources (i.e., class lectures and textbook readings).

Test preparation activities. Table 2 also presents students' average endorsement to two test preparation activities, "Do you organize materials for essay questions" and "Do you use who, what, when, where, and significance questions to guide your study." Students' average endorsement of these activities is 3.81 and 4.16 respectively on a 5-point Likert scale. No statistical difference between Linked-students' and Comparison students' scores were observed. Although these activity scores indicate slightly higher strategy engagement compared to scores for routine studying, they still do not reveal robust or widespread engagement by the majority of students.

Specific study strategies. Students were provided a list of specific learning strategies and their definitions and asked to "Check the learning strategies which you used most frequently and/or found most helpful in studying for History 153." Table 3 presents those strategies that students checked most frequently. The four strategies listed at the top of the table were endorsed most frequently by all the students at similar levels of agreement. That is, both groups of students displayed the same pattern of endorsement for these strategies (a) Taking notes on lecture and text, (b) Organizing materials for essay questions, (c) Underlining text, and (d) Writing answers to questions on study guide.

In contrast, the four strategies listed at the bottom of Table 3 show a different pattern of endorsement by the two groups of students. These strategies were endorsed frequently by the Linked-students but not by the Comparison students. A higher proportion of Linked-students than Comparison students reported engaging in the following strategies: (a)Mapping, (b) Editing notes after class, (c) Annotating text margins, and (d) Outlining. This finding is important in that it provides evidence that Linked-students employed a unique set of study strategies in the History course than Comparison students. One interpretation of this is that the Linked-strategy instruction course had an influence on Linked-students' study practices within the context of the History course. This pattern of strategy engagement suggests that they transferred strategies from the Linked-instruction course to their History course. It was concluded that modeling of strategy use and dialoguing about strategy effectiveness were potent facilitators of strategy maintenance and transfer to learning History content, as has been shown in other research (Gagne et. al 1993; Rosenshine & Meister, 1992).

Gain Scores (Pre- and Post- Strategy Engagement)

T-tests on matched-student responses on the Pre- and Post- Questionnaires compared pre- scores with post- scores. In addition, gain scores for Comparison and Linked students were compared. Gain scores for the two groups of students did not differ statistically; however, both groups of students reported significant increases in the time they spent preparing for history exams (Item No. 1), and (at the end of the quarter) both groups of students reported significantly lower expected grades in the history course (than they had initially expected to receive). In addition, Comparison students reported significantly less time spent prior to class by the end of the course (Item No. 2) and significantly less use of the professor's who, what, why, when, where, and significance questions for studying important terms (Item No. 10).

Academic Achievement and Strategy Engagement

The effectiveness (or predictive validity) of students' study activities was assessed by correlating students' level of endorsement to particular study activities and their final grade in the History course. Although correlations could not be calculated for all the study activities and strategies listed on the questionnaire, where possible a statistic was calculated. The results are presented in Table 5. For all students, there was a significant positive correlation between students' reported time spent studying for an exam and their final grade in the course (r = .41, $p < .05$). In addition, the correlations are high for both Linked-students (r = .52) and Comparison students (r = .37).

Routine reading and note-taking activities. Table 5 also shows the correlations between the two study activities, "Do you prepare for class by reading assigned materials" and "Do you review and integrate lecture notes and text notes" and final grade. The results suggest a differential pattern of effectiveness of these study activities for Linked-students and Comparison students. Increased engagement in these two routine study activities appears to be reliably correlated with final grade for Linked-students (r = .65 and r = .65, $p < .05$, respectively) but not for the Comparison students (r = -.07 and r = .06, respectively) and not for all students together (r = .05 and r = .24 respectively). This result does not rule out the chance that the Comparison students' reports are overly restricted by homogeneity, that is, they may all engage in routine studying.

Test preparation activities. The final two study activities shown in Table 5 pertain to test preparation activities. The results show that for all students, greater engagement in the activity "Organizing materials for possible essay questions" was significantly correlated to final grades in History (r = .33, $p < .05$). This finding was statistically significant for Linked-students (r= .67) and descriptively positive for the Comparison students (r = .22). (We need to check the scatter plots of these correlations to see if Comparison students' reports show a ceiling effect or are overly homogeneous.) Finally, the correlation between the study activity "Do you use who, what, when, why, and significance questions to study" was significant for Comparison students (r = .35, $p < .05$), but not for Linked-students (r = . 05). Thus, for Comparison students, the more frequently they engaged in constructing questions to learn information on the study guide (a list of terms), the greater their final grade in History. For Linked students, this strategy apparently was not as effective.

Academic Achievement

When test scores and course grades were compared between the Linked students and the Comparison students in the history class, the grade differences were not shown to be statistically significant. See Table 6 for descriptive statistics and t-values for these academic performance comparisons for the Linked students and the Comparison students. The frequency distribution of the students' course grades and withdrawals from the history course are reported in Table 7.

One-way analysis of variance was used to determine the means between which significant differences may have existed for various subgroups of students in the history course. It was found that regularly-admitted Comparison students (with more than 45 hours of earned academic credit) earned significantly higher grades in the history course than the first-term, at-risk, Linked students. However, course grades earned by the Linked students were not significantly lower than grades earned by regularly-admitted Comparison students who had completed less than 45 hours before taking the history course. Nor were the Linked students' history course grades significantly lower than Comparison students in the history course who had completed a prior Learning Support reading course.

Discussion

The Linked-instruction teaching model provided a new way to integrate several essential features needed to ensure (a) successful task analyses and negotiation in a college social science course; (b) students' acquisition of functional, goal-oriented strategies within a meaningful context; (c) explicit linking of the strategy-acquisition context to the transfer context; (d) provision for direct modeling and explanation of relevant strategies using appropriate content material and assignments; (e) provision of metacognitive awareness training for use of strategies; (f) provision for multiple opportunities to evaluate the effectiveness of strategies through peer discussion and dialogue about particular aspects of strategies; and (g) opportunities for extended practice with guided, informative feedback (e.g., students were required to use the strategies during the entire term and to adapt the strategies to meet the various demands, goals, purposes, and requirements of the course). Furthermore, results indicate that the linked course model may be an appropriate way to deliver academic support for at-risk college students.

It is important to remember that the Linked students in this study were not only first-quarter freshmen, but they were also provisionally-admitted first-quarter freshmen. At this university, these students have been typically placed in remedial classes where they have earned no academic credit toward graduation. The Linked students were given the opportunity to satisfy the provisional reading requirements in conjunction with a credit course. Surprisingly, the academic performance of the Linked students in the history course was similar to the academic performance of the Comparison students. The difference between the average test scores and course grades of the two groups was not significant. Only those regularly-admitted students with more than 45 quarter hours had a significantly higher mean course grade than the other sub-groups of students. The Linked students performed essentially as well as the Comparison students in the history course and better than students who, according to a prior study (Stallworth-Clark, 1996) had completed their reading course requirement before taking HIS153 at this university (Mean GPA for the Linked students was almost a half grade point higher on a four-point scale than the average grade of the 1994 reading student cohort.)

A number of interesting results were found. First, the results indicate that Linked-students' engagement in routine class preparation activities was an effective self-management activity in the reading-intensive course, History 153, where reading assignments were long and where a premium was placed on obtaining large amounts of verbal information from lectures and reading assignments. Thus, the researchers concluded that Linked-students benefitted from task analysis, distributed practice, repetition and consolidation of new information, and perception of progress in task negotiations in the history course. Because the amount of material covered in the history course (number of pages and topics per exam) was so large, cramming (as a "strategy") was ineffective and defeating. However, keeping up with daily reading and reviewing is likely to have provided students with more practice understanding the material and more opportunity to observe or monitor their learning progress. In light of this finding, it appears appropriate to recommend that academically at-risk students be helped to establish and maintain a regimen of reading and reviewing. The Linked-strategy instruction appears to be particularly effective in doing just this. The researchers make this recommendation although increases in routine study engagement were significantly correlated with increases in final grades for Linked-students, no such correlation was found for the Comparison students. Lack of a correlation for the Comparison students may indicate that different factors were operating for the Linked students and the Comparison students or that the Comparison students' reports were homogeneous. (They were already maintaining reading and study regimens.)

In general, students report only moderate levels of engagement in routine studying in preparation for class. This finding is somewhat surprising in light of the fact that the History instructor explicitly

coordinated the daily lecture topic with textbook pages (which allowed students to know precisely what to read prior to each lecture) and provided strong suggestions that students follow this plan regularly. Further investigation is needed regarding students' perceptions of the importance of routine reading and note-taking. Moderate levels of engagement in routine studying despite explicit encouragement may indicate that students do not know the benefits of keeping up with daily reading assignments or do not know how to integrate class lectures and text notes in a productive manner. On the other hand, perhaps students do not perceive routine studying as important or worth the effort. If so, they may simply ignore it despite noble attempts by the instructor to support and encourage routine study activities. If this is the case, the task negotiation process that occurred between the history professor and the students was ineffective.

Second, Table 3 provides evidence that there are similarities and differences in the general pattern of study activities employed by Linked-students and Comparison students in the History course. Whereas the Linked-students appear to share engagement in a number of common strategies with the Comparison students, they also report higher levels of engagement in mapping, editing notes, annotating text, and outlining which Comparison students did not report. One interpretation of this is that the Linked-students' study practices (acquired in the Linked strategy-instruction course) were transferred to the context of the History course.

Third, the correlational results from the test preparation activities reveal significant differences between Linked-students and Comparison students in the effectiveness of test preparation activities. Although the results indicate that "Organizing materials for essay questions" was an effective strategy for all students in the History course, the effectiveness of this strategy may stem from the fact that it supports the kind of processing necessary for successful performance on the essay questions, and from the fact that the test was heavily weighted on the quality of students' essay responses. The results do suggest that this strategy was particularly effective (statistically significant) for the Linked-students. This is explained by the fact that the Linked-strategy instruction provided support for this strategy by helping students acquire a visual mapping strategy for analyzing the task requirements of essay questions and for constructing written responses appropriate to these requirements.

Other correlational results indicate that the question-generating strategy (use of who, what, where, why, and significance to guide studying) for studying terms on the study guide was found to be effective for Comparison students but not Linked-students. It should be noted that although the History instructor suggested that students use the words who, what, when, where and significance as cues to generate questions about terms, the History instructor did not monitor students' acquisition of this activity in any concrete way. In addition, because essay responses were so heavily weighted on the test, little demand was placed on students for using this strategy. Nevertheless, one interpretation of this finding is that accurate or effective deployment of this strategy depended upon students' background knowledge (specific History knowledge), as well as verbal and linguistic abilities. In this regard, Comparison students, relative to Linked-students, had more specific knowledge (as documented by the greater level of college credit completed), and stronger overall verbal reasoning skills (as documented by their higher SAT scores). The researchers suggest that access to relevant background knowledge and verbal/linguistic skill may have been necessary to make effective use of the question-generation strategy. The Linked-students' ability to construct linguistically accurate or elaboratively precise questions (using who, what , when, where, and significance) might be poor because prerequisite verbal skills were not sufficiently developed.

Fourth, although the number of hours that students spent studying for the history exams was an important influence on the grades they earned in the history course, further investigation is necessary to determine precisely what it is that students do with additional studying time, or how time management affected motivation, etc. In a reading intensive course like "The History of Western Civilization," time

may have been utilized for decoding text as well as for the implementation of reading/learning strategies and for critical, reflective thinking.

In sum, the results reveal a differential pattern of strategy engagement and strategy effectiveness for the Linked-students and the Comparison students in the History course. The findings suggest that Linked-students who engaged in relatively higher levels of routine study activities benefitted significantly. For Linked-students, keeping up with daily reading and reviewing had a high pay off in terms of their final grade in the course. In addition, since exam performance was weighted heavily on the quality of essay responses, strategies directed at organizing material (concept mapping) for those essay questions were also appropriate and beneficial, especially for Linked-students. Comparison students appeared to selectively benefit by employing a question-generation strategy to learn specific terms for the exam. Effective employment of this strategy may have depended on specific History knowledge and more developed verbal/linguistic skills. One interpretation of this differential pattern may be that Comparison students (relative to Linked-students) were more homogeneous in their engagement in routine reading and note-taking activities thereby truncating any correlation with achievement scores. The variability in engagement in routine study activities for Linked-students, as well as their use of strategies to analyze and prepare for essay questions, was likely due to the influence of the linked-strategy instruction course.

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Student Pre-Questionnaire --History 153, Western Civilization

CLASS PREPARATION

1.	How much time do you usually spend preparing for history tests?	Hours: 1	2	3	4	more
		Not very well			Very well	
2.	Do you prepare for class before going to class by reading the assigned materials?	1	2	3	4	5
3.	Do you set aside time for studying for history alone?	1	2	3	4	5
4.	Do you review and integrate class lectures with text notes?	1	2	3	4	5
5.	Have you ever worked with a history study group?	No	Yes			

SELECTIVE STRATEGY USE (Definition of learning strategy: the conscious use of a learning technique)

6. Please check the learning strategies which you expect will be helpful to you in His 153..
   - ___A. Underlining text (marking important ideas)
   - ___B. Annotating text margins (writing in key terms/phrases/questions)
   - ___C. Mapping (drawing relationships of topics)
   - ___D. Outlining (numbering hierarchies of topics)
   - ___E. Charting (comparing topics on two dimensions)
   - ___F. Constructing Time Lines (dating events chronologically)
   - ___G. Drilling with flash cards (key term on one side of card, explanatory information on other side)
   - ___H. Taking notes on lecture, text, and outside readings.
   - ___I. Writing answers to questions on study guide.
   - ___J. Editing notes after class.
   - ___K. Organizing materials for essay questions.
   - ___L. Participating in a study group.
   - ___M. Using memory techniques (rehearsal of visuals, mnemonics, drills)
   - ___N. Self-testing (making up sample tests)
   - ___O. Other (please explain on back of this sheet)
   - ___P. No particular learning strategy

7.	Do you try to memorize material for history tests?	Very little 1	2	3	A great deal 4	5

TEST PREPARATION

8.	What do you expect your grade in the course will be?	A	B	C	D	F
		Not much			Very much	
9.	Do you organize materials for possible essay questions?	1	2	3	4	5
10.	When you study to remember specific terms, do you use "who, what, when, where, significance" questions to guide your study?	1	2	3	4	

Student POST-Questionnaire –History 153, Western Civilization

CLASS PREPARATION

1.	How much time did you usually spend preparing for the history 153 unit tests?	Hours: 1	2	3	4	more
		Not very well			Very well	
2.	Did you prepare for class before going to class by reading the assigned materials?	1	2	3	4	5
3.	Did you set aside time for studying for history alone?	1	2	3	4	5
4.	Did you review and integrate class lecture notes with text notes?	1	2	3	4	5
5.	Did you work with a history study group?		No	Yes		

SELECTIVE STRATEGY USE (Definition of learning strategy: the conscious use of a learning technique)

6. Please check (if any) the studying/learning strategies which were helpful to you in His 153.
   - ___A. Underlining text (marking important ideas)
   - ___B. Annotating text margins (writing in key terms/phrases/questions)
   - ___C. Mapping (drawing relationships of topics)
   - ___D. Outlining (numbering hierarchies of topics)
   - ___E. Charting (comparing topics on two dimensions)
   - ___F. Constructing Time Lines (dating events chronologically)
   - ___G. Drilling with flash cards (key term on one side of card, explanatory information on other side)
   - ___H. Taking notes on lecture, text, and outside readings.
   - ___I. Writing answers to questions on study guide.
   - ___J. Editing notes after class.
   - ___K. Organizing materials for essay questions.
   - ___L. Participating in a study group.
   - ___M. Using memory techniques (rehearsal of visuals, mnemonics, drills)
   - ___N. Self-testing (making up sample tests)
   - ___O. Other (please explain on back of this sheet)
   - ___P. No particular learning strategy

TEST PREPARATION

7.	Did you try to memorize material for the history unit exams?	Very little 1	2	3	4	A great deal 5
8.	What do you expect your grade in the course will be?	A	B	C	D	F
9.	Did you organize information for possible essay questions?	Not much 1	2	3	4	Very much 5
10.	Did you study Dr. Egger's list of terms for identification by answering "who, what, when, where, and significance" questions to guide your study?	1	2	3	4	5

Table 1.
Student Demographics

		n	Percent
Gender	Female	46	78
	Male	13	22
Ethnicity			
	African-American	23	39
	Asian-Pacific Islands	3	5
	Hispanic	1	2
	Caucasian	32	54

Table 2.
Post Questionnaire -- Students' Average Endorsement of Self-Directed Activities

Self-Directed Study Activity	Linked Students	Comparison Students	All Students
Study time			
Time spent preparing for history exam	3.55 hrs	3.79 hrs	3.73 hrs
Routine study activities*			
Prepared for class by reading assigned materials	3.00	2.67	2.75
Reviewed and integrated lecture notes and text notes	3.00	3.39	3.30
Test preparation activities**			
Organized materials for possible essay questions	3.82	3.81	3.81
Used who, what, when, where, and significance questions to guide study	4.55	4.03	4.16

Note: *Average student response on a 5-point Likert scale (1 = Not well; 5= Very well)
**Average student response on a 5-point Likert scale (1 = Not much; 5 = Very much)

Table 3.
Post Questionnaire (Item No. 6) -- Percentage of Students Endorsing Select Study Strategies for History 153

Strategy Name	Linked Students	Comparison Students	All Students
h. Taking notes on lecture, text, outside readings	82%	88%	86%
a. Underlining text (marking important ideas)	64%	70%	68%
i. Writing answers to questions on study guide	55%	64%	61%
k. Organizing materials for essay questions	100%	79%	85%
c. Mapping (drawing relationships of concepts)	82%	12%	33%
j. Editing notes after class	82%	18%	37%
b. Annotating text margins (writing key terms/phrases/questions)	82%	30%	45%
d. Outlining (numbering hierarchies of topics)	64%	30%	39%

Note: Comparison students n = 41; Linked students n = 11

Table 4.
Student Questionnaire Pre-/Post- Matched Responses and Gain Score Comparisons

	n	Pre	Post	Gain	t
Item No 1	***How much time did you usually spend preparing for history tests?***				
Linked	8	2.38 hours	3.63hours	1.25* hr.	.55
Comparison	33	2.85 hours	3.79hours	.94***hr.	
Item No. 2*	***Did you prepare for class before going to class by reading the assigned materials?***				
Linked	8	3.50	3.13	-0.38	.59
Comparison	33	3.33	2.67	-0.67**	
Item No. 3 *	***Did you set aside time for studying for history alone?***				
Linked	8	3.63	3.88	0.25	-0.16
Comparison	33	3.39	3.73	0.33	
Item No.4 *	***Did you review and integrate class lectures with text notes?***				
Linked	8	3.75	3.00	-0.75	-0.90
Comparison	33	3.61	3.39	-0.21	
Item No. 5	***Did you work with a history study group?*** (Yes/No)				
Linked	n= 7	(64% Yes)			
Comparison	n=11	(34% Yes)			
Item No. 6 (See Table for Post-Questionnaire checklist.)					
Item No. 7 *	***Did you try to memorize material for the history unit exams?***				
Linked	8	4.13	4.13	0	.44
Comparison	33	3.70	3.48	-0.21	
Item No. 8	***What do you expect your grade in HIS 153 will be?*** [A=4; B=3; C=3; D=1; F=0]				
Linked	8	3.25	1.88	-1.38**	-0.94
Comparison	29	3.03	2.00	-1.03**	
Item No.9*	***Did you organize information for possible essay questions?***				
Linked	8	4.13	4.25	0.13	-0.26
Comparison	31	3.55	3.77	0.23	
Item No. 10*	***Did you study the history professor's list of terms for identification by answering "who, what, when, where, and significance" questions to guide your study?***				
Linked	8	3.88	4.55	0.88	0.50
Comparison	33	3.42	4.03	0.61*	

Note: * Likert Scale Values: 5 = very well, a great deal, or very much; 1 = not very well, very little, not much. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.
Post-Questionnaire Simple Correlations between Self-Directed Activities and Final Grade in History Course.

Self-directed study activities	Linked Students	Comparison Students	All Students
Study time			
Time spent preparing for tests	.52	.37*	.41**
Routine study activities			
Prepared for class by reading assigned materials	.65*	-.07	.05
Reviewed and integrated lecture notes and text notes	.65*	.06	.24
Test preparation activities			
Organized materials for possible essay questions	.67*	.22	.33*
Used who, what, when, where, and significance questions to guide study	.05	.35*	.26

Note: *p<.05; **p<.01; Linked Students n = 11; Comparison Students n = 33

Table 6.
Test Score Comparisons for Linked and Comparison Student Means on HIS 153 Map Quiz, Unit Exams, Final Exam, and Course Grade

	Linked Students		Comparison Students		
	M	SD	M	SD	t
Map Quiz	69 n = 16	30	78 n = 42	21	-1.1
Unit 1 Exam	58 n = 15	19	61 n = 41	20	-0.60
Unit 2 Exam	56 n = 13	14	65 n = 34	15	-1.70
Unit 3 Exam	69 n = 13	14	70 n = 34	21	-0.13
Final Exam	63 n = 12	17	71 n = 34	15	-1.53
Course Grade	1.38 n = 13	1.04	1.85 n = 34	1.10	-1.31

Table 7.
Frequency Distribution of Students' Course Grades and Withdrawals

	Linked Students		Comparison Students	
Grade	n	%	n	%
A	0	0	2	5
B	2	13	7	16
C	4	25	14	33
D	4	25	6	14
F	3	19	5	12
W	3	19	9	21

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