Study procrastination, achievement, and academic motivation in web-based and blended distance learning

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Abstract

Growth in distance education is increasing the need to examine students’ learning strategies in distance and blended learning environments. Students’ cramming or spaced-review behaviors were measured and compared across delivery formats as well as examined related to course achievement and attitudes across a term. Although theory would predict that spaced study rather than last minute cramming would yield higher achievement, researchers report mixed findings in both areas. One hundred fifty-seven students in distance and blended course formats were blocked into 5 groups based on their cramming/spaced-review patterns a week prior to each of 3 posttests. Significant differences were observed in cramming/spaced-review behaviors between delivery formats and for achievement and attitudes.

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1. Introduction

Distance education is increasing exponentially, creating a need to examine students’ personal study strategies in different formats of distance courses and the possible impact their study strategies have on their achievement. Moore and Kearsley (1996) describe the relationship between level of learner self-management and degree of course structure as transactional distance, i.e., more independent learners succeed in distance courses with less course structure and interactive dialogue than less independent learners. A total web-based course has more transactional distance and requires more learner self-management than a blended course that is partially distance and partially face-to-face with instructors. In a distance course, students tend to have more control over whether, when, and how they will study, and this increased freedom or opportunity for self-management may lead to study procrastination, which in
turn would result in cramming for posttest examinations. Students in blended courses, however, have less transactional distance because their study is more managed, and they may be less likely than total distance students to procrastinate in their study.

Regardless of course format, theory would lead one to predict that spaced study, i.e., study that is distributed throughout the duration of the course, rather than procrastination and last minute cramming, i.e., study that is sporadic and concentrated near exam times, would yield higher achievement and be related to positive attitudes about a course; however, researchers report mixed findings in both areas. The purposes of this study were to (1) compare students’ observed levels of procrastination/spaced-study behavior in two distance course formats, total distance and blended, for the same course; (2) examine the stability of their procrastination levels across the three posttest exams; and (3) examine the students’ posttest achievement and attitudes related to their observed study patterns.

2. Rationale and background

Previous research has examined the association between students’ study habits and their achievement (Reiser, 1984; Richardson, Morgan, & Woodley, 1999; Thomas, 1988). Included among the behaviors examined are self-regulation (Peverly, Brobst, Graham, & Shaw, 2003; Ross, Salisbury-Glennon, Guarino, Reed, & Marshall, 2003), the amount of time spent studying (Gortner Lahmers & Zulauf, 2000), and students’ tendency to procrastinate or to cram for exams rather than distribute practice of skills over the term (Schouwenburg & Groenewoud, 2001; Zuriff, 2003). Researchers have reported a positive association between achievement and desirable study behaviors (Steel, 2002), effective self-regulation (Kitsantas, 2002), and increased study time (Rau & Durand, 2000). Other studies report contradictory findings such as no relationship between procrastination and exam performance (Pychl, Morin, & Salmon, 2001) or between study time and exam performance (Zuriff, 2003); or no difference in performance between extended or limited practice time (Shute & Gawlick, 1995) or an inverse relationship between study time and grades (Olivares, 2002). Relationships between procrastination behaviors and achievement have been examined in web-based courses with researchers typically linking poor study habits with lower levels of achievement (Taraban, Maki, & Rynearson, 1999; Tuckman, 2002).

Affective aspects of study habits have also been examined with researchers exploring procrastination as a theoretical construct with various psycho-social elements. Goal importance was found to be positively related to reported use of good study habits in a study of the theory of planned behavior as an explanation for students’ study habits by Sideridis (2001). Steel (2002) found that energy regulation, automaticity, temptation attention control and goal attention independently predicted procrastination. In addition, Steel found that procrastinators exhibited a gap between their intentions and their actions; that procrastinating activities are related to personality traits; and that proximity to temptation and impulsiveness are predictors of procrastination. Steel, Brothen, and Wambach (2001) concluded that self-report measures of procrastination behaviors are influenced by self-concept. Ferrari and Tice (2000) characterize procrastination as a self-handicap and found it related to whether students’ performance would be evaluated. Senecal, Lavoie, and Koestner (1997) had also found that students who expected to be evaluated procrastinated more than students not expecting their performance to be evaluated. Study habits were also found to be related to students’ perception of course quality (Richardson & Price, 2003).

3. Method

3.1. Data source

The sample included 163 students enrolled in the upper division course, Measurement for Teachers, during the summer semester 2004. The students were from various majors including elementary education, special education, secondary academic subjects, and performance areas such as art, music, and physical education.

3.2. Instructional format

The course, required of all undergraduate teacher education majors, is offered in two instructional formats: blended sections where students have access to all web-based instructional materials as well as weekly computer laboratory sessions with an instructor, and total distance sections where students come to campus only for proctored posttest
All students follow the same class syllabus and study schedule, and they take common course, objective-style examinations in a proctored setting.

### 3.3. Development of cramming/spaced-study scale

The Cramming/Spaced-Study measure was created by observing student rehearsal, i.e., practice test behaviors within the website. Each web-based instructional session contains two or more rehearsal assessments, and these sessions are divided into three instructional units. One week prior to each scheduled unit exam, students’ study behaviors were classified. At this point, on-schedule students should be ready to enter the last instructional session and take the unit practice exam. The scoring plan for students’ web-based study behaviors is included in Table 1. The lower the students’ Cramming/Spaced-Study score, the more cramming required in the next week to prepare for the exam.

### 3.4. Posttests and attitude measures

Three objective-style, higher-order skills exams were administered covering test design/development, performance analysis and evaluation, and communication of learner progress. All posttests were secured using a password and administered using Blackboard in a proctored computer laboratory. Attitude measures were from the Academic Motivation Profile (AMP) (Carey, 1990), based on Keller’s (1987) ARCS model of academic motivation, that was administered during orientation to assess students’ initial expectations for the course and again following the last posttest as an end-of-term course rating. These attitude measures are administered via Blackboard enabling linking students’ ratings to their achievement and study behaviors. The AMP yields reliable results with strong internal consistency reliability estimates for the overall scale (Cronbach’s alpha ≥ .94) as well as the four factors (Cronbach’s alpha .83–.94). Confirmatory factor analysis indicated that the data fit the hypothesized model of an academic motivation construct with four well-defined factors (attention, relevance, confidence, and satisfaction (Pearson, 1992). More recent use in distance education evaluation studies supports its use as an affective course evaluation tool.

### Table 1

<table>
<thead>
<tr>
<th>Score</th>
<th>Study behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Student has not entered website at all</td>
</tr>
<tr>
<td>2</td>
<td>Web session 1 orientation and pretests</td>
</tr>
<tr>
<td>3</td>
<td>Web session 2</td>
</tr>
<tr>
<td>4</td>
<td>Web session 3</td>
</tr>
<tr>
<td>5</td>
<td>Web session 4</td>
</tr>
</tbody>
</table>

Student has entered but not necessarily completed the assessments for:

- **Unit 1**
  - Score 1: Web session 1
  - Score 2: Web session 2
  - Score 3: Web session 3
  - Score 4: Web session 4

- **Unit 2**
  - Score 1: Web session 1
  - Score 2: Web session 1
  - Score 3: Web session 2
  - Score 4: Web session 3

- **Unit 3**
  - Score 1: Web session 1
  - Score 2: Web session 1
  - Score 3: Web session 2
  - Score 4: Web session 3

Note: Range of cram space-study was 1 through 5 for each unit.

### Table 2

<table>
<thead>
<tr>
<th>Study habit level</th>
<th>Exam 1 Mean</th>
<th>Exam 1 sd</th>
<th>Exam 2 Mean</th>
<th>Exam 2 sd</th>
<th>Exam 3 Mean</th>
<th>Exam 3 sd</th>
<th>Expectations Mean</th>
<th>Expectations sd</th>
<th>End-of-term Mean</th>
<th>End-of-term sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>81</td>
<td>12</td>
<td>86</td>
<td>6</td>
<td>81</td>
<td>12</td>
<td>73</td>
<td>16</td>
<td>82</td>
<td>11</td>
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<tr>
<td>Level 2</td>
<td>78</td>
<td>13</td>
<td>86</td>
<td>9</td>
<td>83</td>
<td>13</td>
<td>80</td>
<td>7</td>
<td>76</td>
<td>24</td>
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<tr>
<td>Level 3</td>
<td>79</td>
<td>11</td>
<td>89</td>
<td>8</td>
<td>86</td>
<td>10</td>
<td>82</td>
<td>7</td>
<td>89</td>
<td>9</td>
</tr>
<tr>
<td>Level 4</td>
<td>82</td>
<td>12</td>
<td>89</td>
<td>8</td>
<td>90</td>
<td>8</td>
<td>74</td>
<td>14</td>
<td>68</td>
<td>30</td>
</tr>
<tr>
<td>Level 5</td>
<td>81</td>
<td>10</td>
<td>89</td>
<td>7</td>
<td>85</td>
<td>13</td>
<td>77</td>
<td>12</td>
<td>74</td>
<td>21</td>
</tr>
</tbody>
</table>
3.5. Analyses

Individual students were not consistent in their cramming/study levels across the three observations during the semester; thus, study level groups needed to be reformed prior to each posttest exam, and data for each examination were analyzed separately. Students’ study levels by course format were compared across the term using repeated measures ANOVA. Achievement and attitudes were compared for Exams I and 3 using MANOVA, and achievement was contrasted for Exam 2 using ANOVA. Follow-up contrast tests were used to compare groups when significant differences were observed.

4. Results

Means and standard deviations for all measures across all five study behavior levels are displayed in Table 2. Table 3 contains a summary of the study questions and results, including follow-up comparisons for differences in students’ observed study behaviors prior to each of the three exams. Fig. 1 contains a graph illustrating differences in study behaviors across time for the two distance course formats. From these data, it appears that students in the total distance class tended to procrastinate at relatively the same level across the semester while students in the blended class tended to procrastinate more.

Table 4 contains the comparisons of cramming/spaced-study levels with students’ achievement on each of the three exams. No significant differences were observed for different study levels for Exam 1, Test Design and Development, and Exam 3, Communication of Learner Progress; however, significant differences in achievement were observed for

![Changes in study habits across time](image-url)
Exam 2, Analysis and Evaluation, with the greatest procrastinators (Levels 1 and 2) earning significantly lower test scores than students at Level 3.

Table 5 contains the comparisons of cramming/spaced-study levels with students’ attitudes about the course. No significant differences in students’ precourse attitudes (expectations) were observed for students across the cramming/spaced-study levels. In contrast, significant differences in end-of-term ratings were observed across the procrastination levels. The greatest procrastinators, Levels 1 and 2, rated the course significantly lower than mid level procrastinators. Additionally, students at Levels 1, 2, and 3 judged the course less favorably than students at Level 4.

Differences in procrastination levels and students’ end of course ratings were also examined within each distance format and these data are included in Table 6. There were no significant differences across levels for students in the totally distance sections. In contrast, significant differences were observed in course ratings within the blended sections. Students who used a spaced study rather than any procrastination pattern (Level 5) rated the course more positively than did students who procrastinated more.

5. Discussion and conclusions

Contrary to expectations based on transactional distance (Moore & Kearsley, 1996), students with live instructors (blended) and less transactional distance tended to procrastinate more than total distance students with greater transactional distance. These results may be explained by self-selection, i.e., more independent learners opt for the total distance sections. Consistent with research related to procrastination, study habits, and achievement (Steel, 2002; Pychyl, Morin, & Salmon, 2001; Shute & Gawlick, 1995), achievement findings in this study were mixed. Students across procrastination levels demonstrated comparable achievement on Exams 1 and 3, yet those who procrastinated more did not perform as well on Exam 2. Results were also consistent with research related to students’ procrastination behavior and attitudes. At the outset, students across study levels and course formats were comparable in their ratings for course expectations.

At the conclusion of the class, however, distance students rated the course comparably across study levels, but blended students who were on schedule rated the course more positively than those who were procrastinating, possibly indicating a positive relationship between procrastination behavior and perceptions of course quality.
(Richardson & Price, 2003). Perhaps these results reflect that students in blended course environment experience a higher level of discomfort when the consequences of weaker self-management behaviors are exposed in a face-to-face social learning context.

Related to limitations, students could not be randomly assigned to the two course formats; instead, they self-selected and undoubtedly chose the format most suited to their study patterns. Additionally, the study was conducted during the summer semester when the pace of courses and study is increased which might tend to make even typically on-task students procrastinate more than usual. The study will be replicated during the fall semester to examine the consistency of these results in a 16 week rather than a 10 week semester.

Besides a replication study in a longer semester, it is important to examine students’ last minute cramming behavior within the week prior to the examination. If students actually crammed a lot during the last week, then it could possibly explain the lack of significant differences in posttest achievement among the procrastination/spaced-study levels on Exams 1 and 3.

### References


