



# The effect of motivational scaffolding on procrastinators' distance learning outcomes <sup>☆</sup>

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## Abstract

The purpose of the research was to determine experimentally whether the addition of features to enhance learner motivation and collaboration, termed motivational scaffolding, to the “traditional” distance learning design improved engagement, and performance, particularly among procrastinators. Two versions of a web-based five-credit study skills course, both covering the same content and sharing all features save for the scaffolding, were compared: traditional-distance, and motivationally-scaffolded distance, during each of two terms. Motivational scaffolding consisted of using chat to run study skills support groups, where students were helped to stay on task, and instructor office hours. Students were classified as either high or low procrastinators, and randomly assigned to each version, and two instructors alternated between versions taught from one term to the other. Results showed that procrastinating students, for whom the lack of structure of distance learning may be problematic, performed better in the motivationally-scaffolded version than the traditional, while non-procrastinating students performed equally in both.

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## 1. Introduction

Distance education has undergone radical changes in the past decade due to technological advancements in networked computing, in turn causing college curricula to change to incorporate the potentialities made available by the Internet and the World Wide Web. Benefits of current web-based distance learning include increased flexibility to meet specific learner needs, equity of educational opportunities no matter physical locale of learner, and expansion of the resource base for the learner (Kerka, 1996). Disadvantages of web-based distance learning include the requirement of basic technology skills on the part of the learner, the possibility of social isolation, and a reliance on learner initiative in an environment with less supervision than a traditional course setting (Kerka, 1996).

The lack of supervision and reliance on learner initiative often leads to excessive procrastination and reduced performance, especially among students inclined toward procrastinating (Tuckman, 2005). Even when distance courses are designed to have a considerable number of performance requirements and frequent deadlines, many students treat the opportunity for self-pacing as an invitation to procrastinate. The absence of an on-site instructor makes this behavior difficult to control.

By its very nature, distance learning requires that students engage in self-regulation, given that no instructor is physically present to regulate their behavior. Those who have a propensity to engage in dilatory behavior, that is, procrastinators, have difficulty focusing their attention on a task, estimating the time needed to complete it, and evaluating the effectiveness of their studying behavior (DeWitte & Lens, 2000). Thus, they are likely to be at a disadvantage in the relatively unstructured distance learning environment. In terms of dealing with learning difficulties in any setting, Cullinan (2002) has suggested the general approaches of restructuring the learning environment and using social influence.

Scholars have examined deficiencies in web-delivered distance learning courses, and developed several strategies to increase learner motivation and decrease social isolation within them. Keegan (1986) argued that the key component of distance education should be dialogue that may be initiated by the learner, as opposed to the learner merely receiving messages passively. Ben-Jacob and Levin (1998) document the general trend away from passive learner models to more active learner models facilitated by newer technologies of distance education, and predict that collaborative learning will become an integral part of higher learning. Hiltz (1998) articulates the problems of web-based distance learning courses as primarily resulting from loss of the sense of community, and cites collaboration as a necessity if on-line distance learning courses are to be as effective as traditional, site-based courses. Collaboration, as a vehicle to foster a sense of community and to combat social isolation, and, further, as a technique to foster learner initiative and motivation, should be built into web-based distance learning.

Keller (1999) makes the case that effective distance learning must have student motivational tactics integrated into the course design. Winfield, Mealy, and Scheibel (1998), in recognizing motivation as a primary problem of distance learning, developed a pedagogical model which incorporates emphasizing presence of the instructor, providing a clear set of learning activities, relating learning to students' personal experiences, tying content to real-world applications, and fostering student collaboration.

## 2. Purpose of the study

In acknowledging the dilemma of student initiative and motivation in scenarios of distance learning, the present study was designed to: (a) build into a course components designed to maximize learner engagement and initiative, and (b) evaluate the effectiveness of these components in terms of course and term performance of procrastinators in comparison to non-procrastinators.

## 3. Collaboration-based interventions

Makrakis (1998) has articulated several conditions for effective use of collaborative distance learning, which include student interdependence, personal responsibility, and engaging instructors who are able to coach students. Zack (1995) demonstrated that use of frequent computer-moderated communication between instructor and students enabled the instructor to be more accessible and responsive to students, and increased the perceived quality of the class and the effectiveness of the instructor. Firdayiwek (1999) recommends, at minimum, web-based courses consist of integrated synchronous and asynchronous communication tools, web-based presentation platforms for students, and flexibility in the distribution of responsibilities of the instructor and the learners. The literature suggests that: (1) special attention to the nature of the learner/learner and learner/instructor communication is necessary to fully exploit the benefits of distance learning, and (2) strategies should be employed that focus on fostering collaboration, self-motivation, and learner initiative.

Tuckman and Schouwenburg (2004) describe a behavioral approach for reducing procrastination in academic settings by getting students to follow a regular pattern of studying, referred to as *task management groups* in many Dutch universities, and *study skills support groups* in the “Americanized” version. It is designed to provide motivational scaffolding in the form of strategies to increase the quality and frequency of learner/learner and instructor/learner computer-moderated communication, with attention to feedback mechanisms, motivational meetings, and personal accountability.

The term *scaffolding* refers to an instructional technique where the teacher models the desired strategy, then gradually shifts responsibility to the learner (McGee & Richgels, 1996). The essential features of scaffolding are that it must: (a) occur in a collaborative context that reflects the learner’s own intentions, (b) operate across the learner’s zone of proximal development, and (c) be withdrawn as the learner becomes more competent (Beed, Hawkins, & Roller, 1991). Motivationally-scaffolded distance learning, which incorporates many aspects missing in typical, “traditional” distance learning courses, represents the use of scaffolding to support learner motivation as an enhancer of student learning. For example, the instructor role of “coach” is emphasized. Study skills support groups, utilizing electronic synchronous and asynchronous communication tools, are employed, providing for learner-to-learner guided conferencing, moderated by the instructor/coach. Material in the scaffolded distance-learning course is time-released. Frequent instructor feedback comes in the form of planned synchronous and asynchronous messages, increasing the responsiveness and accessibility of the instructor. Over time, when students demonstrate sufficient motivation, the motivation-inducing activities are gradually withdrawn.

Given the proliferation of distance education courses and programs at colleges and universities, it is highly important that the educational and telecommunications characteristics of these efforts be successful in terms of both economic and human capital. This requires that completion rates and achievement gains be comparable to those provided by campus-based courses. To ensure this, attempts to develop and improve the educational and telecommunications aspects of distance education as tested here must be carried out.

## 4. Methods

### 4.1. Participants

The total number of participants was 93, all of whom were students at a large midwestern university who completed a five-credit, letter-graded elective distance course in learning and motivation strategies during either the Winter 2003 or Spring 2004 Quarters. Assignment to each of the distance versions, traditional and motivationally scaffolded was done on a random basis, without the awareness of the students. The demographics of the sample were as follows: 56% male, 44% female; 31% minority, 69% non-minority; 44% first-year students, 27% second-year, 16% third-year, 13% fourth-year; 32% GPA (on a scale from 0 to 4) under 2.2, 36% GPA over 2.2 but under 2.9; 32% GPA 2.9 and over.

### 4.2. Instructional treatments

There were two instructional treatments: (1) traditional distance, and (2) motivationally-scaffolded distance. Each version used the same course and was identical in all of the following aspects: (a) syllabus; (b) content; (c) calendar; (d) textbook; (e) course development tool/database; (f) inclusion of 216 web-based learning performance activities, including assignments, end of unit tests, online, threaded discussions on course content, portfolios, and papers, all with deadlines.

The *traditional distance learning treatment* was done at a distance, with all instructor-learner interaction occurring asynchronously via the Internet, triggered either by learner questions or instructor reminders. The *scaffolded-distance learning treatment* added to the traditional distance learning treatment two major features that were intended to provide a vehicle for collaboration, motivation, and coaching between learners, and between them and the instructor, in order overcome the perceived “deficiencies” of the traditional approach. These two features are described below.

*Study skills support groups* (Tuckman & Schouwenburg, 2004) were modeled after other well-known self-regulation support groups (e.g. rehabilitation groups). The members “met” on a weekly basis for one hour, with the time being divided into three 20 min segments. In the first segment, half of the members served as another student’s *supporter* or sponsor, and in the second segment those who had played the student role in the first segment switched to the supporter role, except for a different member than the one who had served as his or her supporter. Thus, the relationship was a triangle rather than a pair.

The supporter’s task was to help the student partner manage his/her time by reviewing weekly *To-Do checklists* (Tuckman, Abry, & Smith, 2002) prepared by the partner and comparing them

to the partner's report of subsequent task accomplishment (i.e. successes and failures). These checklists contained weekly study tasks broken down into small steps and listed as specific and measurable, concrete activities (e.g. do the 10 exercises listed at the end of Chapter 3 in my math textbook). After discussing the prior week's accomplishments, the checklist for the coming week was discussed.

Supporters were trained by the instructor on playing their role. Guidelines included having them provide feedback to their partners on the organization of their checklist, for example, whether the work: (a) was spread out over the entire week, and (b) could be realistically accomplished, posing questions about the benefits of using the checklist, and offering advice on checklist improvement.

After the two segments of supporters working with their partner one-on-one, the last segment featured the group meeting as a whole (including the instructor) to review the results of all the supporter-partner meetings. The purpose of the group meeting was to provide social influence in the form of group support and rewards for studying behavior. Weekly meetings between supporters and their partners and between all group members (and instructor) were required during the first half of the course, and were done online, synchronously, in a chat room – using *Parachat* software. Students were also required to send their checklists to their supporters the day before the meetings were held. During the second half of the course these meetings were gradually phased out.

Regularly scheduled instructor *Office Hours*, a characteristic part of campus-based instruction, were also done in motivationally-scaffolded distance learning, also synchronously, in a chat room. Instructors announced two hourly meetings a week and students were required to attend one of them, based on their schedule. All students attending the meeting were required to participate. These meetings were also gradually phased out during the second half of the course.

#### 4.3. Course measures

The following measures were employed (all obtained online) in both instructional treatments: (a) *Course Performance Percentage Score* – a measure of course engagement in the form of percentage of the 1000 available points for performance on the over 200 learning performance activities that each individual student actually earned; (b) *Grade Point Average* for the term the course was taken (reflecting the fact that the purpose of the course was to improve academic performance); (c) *Student Evaluation of Course* – student evaluations of instruction, course content, and instructor in terms of perceived quality of presentation, likelihood and ease of application, and overall satisfaction; also included were open-ended questions about what was liked most and least, and suggestions for change.

#### 4.4. Procrastination tendency

This was measured using the *Tuckman Procrastination Scale*, a 16-item instrument with responses on a four-point Likert scale (no neutral point). The validity and reliability of the instrument have been established (Tuckman, 1991). In this study the reliability coefficient of the scale was calculated as 0.89. The scale was administered online as part of the course, at the beginning of the second week. A median split of the pooled sample was used to classify students as either high (50–77) or low (24–49) procrastinators.

#### 4.5. Procedure

Comparisons between the two distance learning versions of the learning and motivation strategies course were run during two consecutive academic quarters. At random, half of the enrollees in the two distance formats were assigned to each instructional treatment, without drawing their attention to the differences in the two approaches. Each treatment was taught by a different instructor, with the two instructors, both of whom were experienced, switching instructional treatments from one quarter to the next. Hence, both student selection bias and instructor bias were controlled, making the design a true experiment. At the beginning of the course, all students completed a permission form for data access that had been approved by the Human Subjects Institutional Review Board.

#### 4.6. Analysis

Data from the two quarters on all of the measures were pooled into a single data set for analysis. Sample sizes for each analysis reflect the number of students for whom both procrastination and final performance scores were available, that is, students who completed the course. Statistical tests were run on the course performance and grade point average measures, with instructional treatment as the independent variable and procrastination level as the moderator variable.

### 5. Results

#### 5.1. Course performance

An analysis of covariance of performance percentage score by instructional treatment (motivationally-scaffolded versus traditional) and procrastination tendency (high versus low) with prior cumulative GPA as the covariate was run. The purpose of the covariate was to control for differences in student academic capability between the groups. While the analysis yielded no significant main effect of either treatment ( $F = 1.011$ ,  $df = 1/88$ ,  $p > .05$ ) or procrastination tendency ( $F < 1$ ,  $df = 1/88$ ), it did reveal a significant interaction between instructional treatment and procrastination tendency ( $F = 3.94$ ,  $df = 1/88$ ,  $p = .05$ ). Adjusted mean course percentage scores for high procrastinators were as follows: 90% in the motivationally-scaffolded condition, 83% in the traditional distance condition. For low procrastinators, the means were 86% and 87%, respectively. These results are shown in Fig. 1.

#### 5.2. Grade point average

An analysis of variance of gain in grade point average for the quarter the course was taken relative to prior cumulative grade point average by instructional treatment and procrastination tendency was run. Gain scorers were used to reflect the impact of the course on academic performance, that being the objective of the course. Like the previous analysis, this one yielded no significant main effect of either instructional treatment ( $F < 1$ ,  $df = 1/89$ ) or procrastination level ( $F < 1$ ,  $df = 1/89$ ), but did reveal a significant interaction between instructional treatment

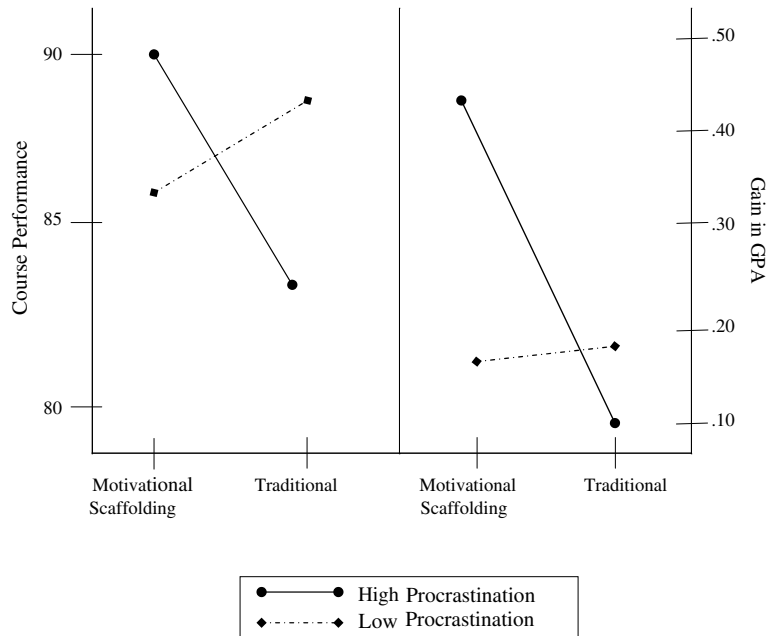


Fig. 1. Differences in (a) course performance and (b) gain in GPA of high and low procrastinating students in the motivationally-scaffolded and traditional instructional treatments.

and procrastination tendency ( $F = 3.99$ ,  $df = 1/89$ ,  $p < .05$ ). Mean GPA gain scores for high procrastinators were as follows: 0.43 in the motivationally-scaffolded condition and 0.10 in the traditional distance condition. For low procrastinators, the means were 0.16 and 0.19, respectively. These results are also shown in Fig. 1.

### 5.3. Student evaluation of course

Students numerical ratings of all aspects of the course were essentially the same, regardless of instructional treatment. However, on the open-ended questions, comments by one-third of the students in the motivationally-scaffolded classes indicated a lack of usefulness of the on-line chats. Since, the evaluations were done anonymously, it was not possible to separate high and low procrastinators, but one would like to believe that those responding critically were primarily low procrastinators.

## 6. Conclusions

It was concluded that motivational scaffolding in the form of synchronous, on-line (chat) support group meetings and instructor office hours provided a collaborative mechanism enabling high procrastinating students to stay on task and meet deadlines. This resulted in better course performance and school term performance than for their counterparts not experiencing any scaffolding beyond the “normal” communication in a distance-learning course. However, the



scaffolding appeared to provide no comparable benefit for low procrastinators, who, presumably, managed their time effectively without such assistance.

It is worthy of note that on both performance measures, the high procrastinators went from being the worst performers to the best performers when they were provided with motivational scaffolding. What this suggests is that procrastinators' characteristic lack of organization and adequate time management typically exercises a depressing effect on their performance, and when these behaviors are improved, presumably by the motivational scaffolding procedures, their true level of ability shows through. Tuckman (1997) demonstrated that students with a high procrastination tendency who were required to take weekly tests in a traditional classroom course did considerably better in their class mid-terms and finals than either higher procrastinators not required to take the tests or non-procrastinators, regardless of whether or not they were required to take the tests. It would appear that assistance with self-discipline and planning is the key to successful learning for students who lack these qualities.

The totally online environment of distance learning, lacking as it does in inherent structure, seems particularly susceptible to the procrastination effect. Techniques such as those tested in this study appeared to be quite helpful in ameliorating this potentially harmful effect. However, given the many individual differences in learners and learning styles, techniques that help one group may have different effects on others. Some of the students in the present study who did not perceive themselves as needing the scaffolding, i.e. those who believed they were fully able to manage their own time, showed a degree of resistance to it, both in word and behavior, that required urging by instructors to overcome.

It was also concluded that online support is an important, if not essential, aspect of online learning if it is to be done effectively. Those who advocate for the use of online learning as a low-cost form of instruction may be reducing its effectiveness by minimizing the availability of various forms of learner support such as scaffolding. It is expected that the motivational-scaffolding procedure will add to the literature in the field, thereby informing others of a way that distance learning can be made more collaborative, can increase learner initiative, and can be made more effective. While some may see scaffolding as a form of "hand-holding" or enabling students to avoid the issue of procrastinating, merely ignoring procrastination may render online instruction of little value for some students. Those teaching at a distance are encouraged to include this procedure to help their procrastinating students stay on task.

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