

# Is Online Leadership Training Effective?

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# Summary

## Background

As part of its ongoing "Revolution in Training," the Navy is using online training initiatives to standardize and make training more efficient and performance focused. This research, the first of its kind for the Navy, identified and assessed leadership training metrics that can be evaluated through an online training program.

Leadership training is a vital part of a Sailor's learning continuum. The Navy is currently using an online training course developed by the Ninth House Network called Situational Leadership II (SLII). This course is designed to prepare Sailors to lead their subordinates. The online delivery mechanism is designed to train Sailors more efficiently by allowing them to take the course at their own pace, on their own time, and while they are deployed.

The SLII course and assessments are being used to supplement training during the Chief Petty Officer (CPO) accession process. This study showed that the Navy can effectively deliver training and assessment programs to a diverse workforce across the world. In addition, using rigorous data collection and analysis techniques, the Navy has the ability to capture feedback from the workforce in a compressed time period. Furthermore, it can continue to monitor and assess training participants outside the classroom through the web.

The objective of the SLII training is to help leaders make better choices given the situations that can arise at work. The training participants' end goals are to be able to:

- Identify the characteristics and needs of employees at each of the four levels of development—enthusiastic beginner, disillu-

sioned learner, capable but cautious performer, and self-reliant achiever.

- Adjust their leadership style to the needs of the employee, task, and situation using the four leadership styles—Directing, Coaching, Supporting, and Delegating.
- Reach agreement with employees on how much direction and support they need to accomplish their goals and become self-reliant, peak performers.

The goal of this report is to evaluate the SLII training for CPO selectees and identify the effect of the training on satisfaction, learning, behavior change, and leading indicators of performance improvement. Furthermore, we will identify which Sailors perform better in this course and make recommendations for future uses of the course. Finally, we will recommend how to improve the feedback and course evaluation parts of the training.

## Tasking

The Navy Personnel Development Command (NPDC) has tasked CNAC to evaluate the effectiveness of online leadership training. As part of this effort, the Navy mandated that all 2004 CPO selectees take the Ninth House SLII training course. The Navy asked CNAC to answer the following questions:

- Do participants meet the training objectives through learning, changing their behavior, and improving their performance?
- What is the effect of being exposed to other leadership training?
- Are there cost savings for online courses compared to traditional classroom training?
- At what point in a Sailor's career should the courses be offered?
- How can future training evaluations be improved?

## Findings

The following is a summary of our conclusions:

- CPOs generally liked the course and found it useful to their work.
- Lower satisfaction was due primarily to technical problems.
- CPOs learned the course material.
- E-3s and above learned the material at a much higher level than lower paygrades.
- CPOs did not inflate their self-ratings.
- CPOs applied the acquired leadership skills to the job.
- SLII behavioral assessment did not always measure intended leadership style.
- Groups benefited equally across gender, race, years of education, rate of promotion, ASVAB verbal score, and rating.
- CPOs stated that they improved in leadership areas.
- Situational Leadership cost the same or less in a dollar-for-dollar comparison with traditional brick-and-mortar courses.
- Aviation and Information Technology ratings showed indicators of improvement in critical incidents specific to their fields of work.

## Recommendations

Based on our evaluation, we offer four recommendations:

1. **Continue to use Ninth House Situational Leadership II course for training Navy leadership.** We found that Sailors learn the material, transfer the learning to the job, and state that they improve in key leadership areas. Sailors find the course material to be useful to their job and somewhat enjoyable. The Aviation and Information Technology CPOs suggested that their efficiency improved in outcomes related to their job. Across rat-

ings, CPOs stated that they improved in leadership areas—in some general and in some specific ways.

2. **Promote full participation starting at the E-3 paygrade.** E-3s and above learned the material at a much higher level than Sailors at lower paygrades. In addition, E-3s learned the material as well as or better than those at senior paygrades. We recommend promoting the course to Sailors in leadership positions at paygrade E-3 and above.
3. **Supplement the First Line Leadership Development Program (FLBDP) course for Sailors who are responsible for directing and developing subordinates.** The SLII course cost the same or less in a dollar-for-dollar comparison with traditional brick-and-mortar courses. The course costs will be lower than those at the CPO level because of the cost of the Sailor's time. In addition, because of the Navy's enterprise license with Ninth House, the more people that take the course the cheaper it is per graduate.
4. **Improve the behavioral assessment to better measure effective situational leadership behavior and to assist in providing appropriate feedback.** The SLII behavioral assessment did not always measure intended leadership style. By improving the multi-rater measures of behavior change, Sailors can get helpful and appropriate feedback from their supervisors, peers, and subordinates.



# Introduction

## Background

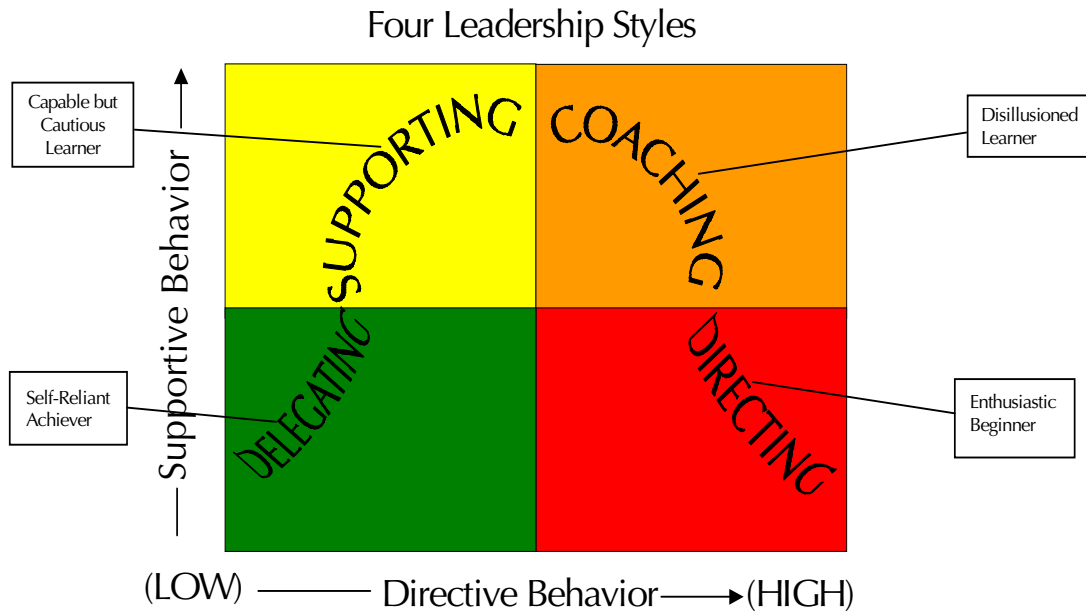
Given changing leadership roles for enlisted Sailors, the Navy has recently instituted a suite of new leadership programs. The training programs consist of three courses: the First Line Leadership Development Program (FLLDP) for Sailors in paygrades E-3 to E-5, Primary Leadership Development Program (PLDP) for E-5 to E-6 Sailors, and the Advanced Leadership Development Program (ALDP) for First Class Petty Officers and CPOs.

As part of the tasking, the Navy asked CNAC to identify whether and how the Ninth House SLII training fits into the Navy's leadership development program. Specifically, we were asked to do five things. The first task was to evaluate whether the training objectives were met through learning, behavior change, and leading indicators of performance improvement. Second, we determined whether Sailor characteristics and previous training affect training effectiveness. Third, we identified the effect on job performance and determined whether there are cost savings for the online course compared to traditional classroom training. To evaluate where the Ninth House training fits into the leadership development programs, we identified at what point in a Sailor's career should the courses be offered. Finally, we were asked to make recommendations on how future training evaluations can be improved.

### SLII training objectives

The objective of the Ninth House Network SLII training course is to teach the material so that participants retain the knowledge, transfer the knowledge to the job, and, in turn, make better decisions and improve their performance on the job. Figure 1 shows the online SLII training objectives program.

Figure 1. SLII training objectives - Blanchard Model



Through the training, participants are expected to be able to better identify the characteristics and needs of employees at each of their four levels of development:

- Enthusiastic beginner
- Disillusioned learner
- Capable, but cautious learner
- Self-reliant achiever.

Leaders are expected to adjust to the needs of the employee, task, and situation using the appropriate leadership style:

- Directing
- Coaching
- Supporting
- Delegating.

Finally, leaders are expected to be able to reach agreement with subordinates on how much direction and support they need to accomplish their goals and become self-reliant, peak performers.

## Procedure

To address these questions, CNAC designed a research methodology using a combination of existing evaluation tools developed by Ninth House Networks, in addition to designing a follow-up assessment to be taken after the training course.

Course participation was mandatory for the CPOs who were evaluated. They were assessed at three distinct times during the course of the evaluation. The assessments included a learning pre-test and post-test, a multi-rater behavior assessment taken before and after training, and a survey that evaluated performance improvement as a result of the training.

The study focused on Chief Petty Officers with special emphasis on those with Aviation and Information Technology ratings. We also evaluated Sailors at other enlisted paygrades when appropriate and where data were available.

We evaluated the course using Kirkpatrick's four levels of training evaluation [1976]:

1. Satisfaction - Level I
2. Learning - Level II
3. Transfer to the job - Level III
4. Performance - Level IV.

In addition to these measures of training effectiveness, we compared the costs of this online training program with those of traditional classroom training.

## Organization of this report

This report is organized as follows:

- The first section describes the approach and methodologies we used to address the study questions.

- The second section discusses our findings, in the following order:
  - Satisfaction with course
  - Learning
  - Transfer to job behavior
  - Performance improvement
  - Cost comparison options

We present our recommendations at the end of the second section.

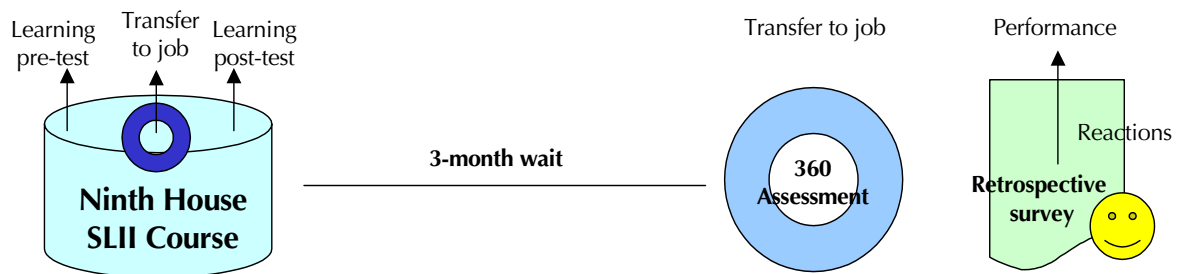
# Data and methodology

## Data collection

### The value of participation

We assessed the value of participating in the online SLII course, to answer the question: What outcome can the Navy expect from the training participants? To do this, we instituted a research methodology and study design to measure learning, behavior change (transfer to the job), leading indicators of performance improvement, and reactions (satisfaction with the course). Figure 2 shows the study design.

Figure 2. Study design



We evaluated the training in the following four ways:

1. *Learning pre-test/post-test*: Compared the pre- and post-test scores from a test that measures learning.
2. *Behavior assessment*: Ninth House conducted a multi-rater survey of participants and of other people who observed the participants' behavior before training and 3 months after training, to see whether participants are performing the acquired leadership skills in their jobs.

3. *Retrospective survey:* We used a retrospective survey of the participants 6 months after training, to evaluate individual characteristics and to identify indicators of performance improvement since the training.
4. *Focus groups:* We conducted focus groups with CPOs who had been through the training and assessments to ask them about the outcomes of the training program and what they thought of the training.

## **Learning pre-test/post-test**

In this study, we used the pre-test and post-test designed by the Ninth House Network. The training is taught through characters in a series of short videos viewed on the computer screen. Each video scenario gives the participant an opportunity to make a decision, based on the scenario presented.

### **Pre-test**

The pre-test uses a “typical” office setting. The participant makes decisions based on scenarios that are typical of the types of decisions that he or she will make throughout the learning and testing portions of the training program. Each question on the pre-test has a response that is “Most Correct,” “Acceptable,” “Incorrect,” or “Doesn’t Matter.” A raw score for the pre-test is weighted, with the most weight given to the “Most Correct” response, and less weight given to the “Acceptable” response. No credit is given for “Incorrect” and “Doesn’t Matter” responses.

### **Post-test**

Six post-tests are taken in the same manner as the pre-test. For simplicity, we used the final post-test because it requires the participant to understand the totality of the course material. The raw score, calculated the same way as the pre-test, was supplied to CNAC by the Ninth House Network.

## **Behavioral assessment**

We also used the Ninth House Network’s multi-rater behavioral assessment. This assessment required participants to choose a maxi-

imum of seven people to rate their behaviors before the training and 3 months after the training course. The participants themselves also rated their behavior before the training and 3 months after the training.

The multi-rater (self and other) participants were asked questions about how frequently the course participant performed behaviors on questions relating directly to the four leadership styles. For example, on the “directing” leadership style, a question was, “When an employee demonstrates a lack of knowledge or experience but is excited to begin a new task, [Leader Name] provides concrete steps for performing the task.” Answers ranged on a scale from “Never” to “Always” performs the behavior (0 = Never, 1 = Almost Never, 2 = Infrequently, 3 = Occasionally, 4 = Sometimes, 5 = Frequently, 6 = Almost Always, 7 = Always, 99 = N/A).

## **Retrospective survey**

Finally, CNAC developed a follow-up assessment measuring performance improvement as a result of the training taken by course participants 6 months after the training. In addition, we measured individual characteristics that prior literature suggested were antecedents to learning, behavior change, and performance improvement.

### **Performance improvement**

We asked participants about specific areas of improvement since the training. We also developed a few performance improvement measures that focused on the Aviation and Information Technology ratings, as requested by the sponsor.

First, we examined performance improvement on eight leadership categories. In the evaluation of the Ninth House SLII training, we used competency data gathered during the Improving the Navy’s Workforce Sea Warrior project to identify areas of work that were directly related to leadership. Using the Generalized Work Activities (GWAs) that were identified through this process, we developed a set of leadership areas that were common across enlisted ratings.

To define the common leadership-relevant work functions, which span job classes, we ran a frequency analysis across 32 job classes and all GWAs within each. Only those GWAs which were leadership-relevant and were shared by 80 percent or more of the job classes were selected as being generalizable for representing the leadership function across jobs. This analysis resulted in the following leadership GWAs:

1. Communicating with Supervisors, Peers, or Subordinates
2. Coordinating the Work and Activities of Others
3. Developing Objectives and Strategies
4. Judging the Quality of Objects, Services, or Persons
5. Organizing, Planning, and Prioritizing Work
6. Scheduling Work and Activities
7. Training and Teaching Others
8. Guiding, Directing, and Motivating Subordinates

Six months after the training, the participants were asked how much they thought they had improved in these eight areas due to the training.

In addition measures of improvement in the general leadership area, we also evaluated outcomes specific to Navy applications of leadership (appendix A). For instance, we asked CPOs in the Aviation and Information Technology ratings specific questions about outcomes that can result from leadership in their jobs. One question for the Aviation rating asked, “As a result of the SLII training, how many hours have you or your subordinates saved in coordinating space preparations over the past 30 days due to improvement in your leadership?” We measured the frequency with which participants reported a time savings due to the training.

Furthermore, we asked general questions that relate to all ratings and Navy leadership. For example, we asked, “As a result of the SLII training, have you improved your ability at mentoring Sailors?” Responses could range from “Not at All” to “Very Greatly.”



## **Satisfaction**

We evaluated the extent to which the participants liked the course and found it useful to their daily activities. We used two scales: satisfaction and utility. The satisfaction scale included such items as: “I found the SLII course material engaging.” Responses could include, “Strongly Disagree,” “Disagree,” “Neither Agree nor Disagree,” “Agree,” and “Strongly Agree.” The utility scale included such items as: “I could see how I might apply the SLII skills on the job.” Response choices were the same as for the satisfaction scale.

## **Individual characteristics**

We were also asked to determine whether certain types of people like and/or benefit more from SLII. To evaluate this question, we asked questions concerning the following three areas, which have been shown in past literature to relate to learning, behavior change, and performance improvement:

- Motivation to learn — This is characterized by the desire and willingness to invest effort to learn material.
- Learning orientation — This has been viewed as both a trait and a state; it involves focus on improving competence and gaining mastery over material in a learning setting and willingness to take risks to learn.
- Comfort with technology — This is an attitude characterized by the extent to which a person is familiar with and enjoys using technology.

## **Focus groups**

### **CPOs’ evaluation of the course**

Finally, we conducted focus groups with CPOs who had taken the leadership training course, the behavioral assessment, and performance evaluations. We conducted focus groups at the Center for Naval Leadership facilities in Norfolk, VA, and Coronado, CA. The focus groups concentrated on five major themes:

1. Is online training appropriate for this type of training?

2. How did you feel about the scheduled timing of the online leadership training?
3. At what point in a Sailor's career should this training be made available?
4. Should this training remain a mandatory portion of the CPO accession process?
5. What were your impressions of this online leadership course?

Themes that emerged from the focus groups were added to the context of the findings where appropriate.

### **Outcomes from Aviation and Information Technology groups**

We also conducted focus groups with the Information Technology and Aviation ratings. Through these sessions, we collected job outcome and performance data from Leading Chief Petty Officers, including information on how leadership skills play a role in the mission-critical competencies associated with each rating. Furthermore, we hoped to gain understanding into the specific individual performance measures by which a CPO is rated. Specifically, we were looked at the performance factors that may be related to leadership behaviors.

We asked the Sailors to review the work that was associated with their rating. Next, we asked them to identify examples of "critical incidents" when leadership skills were directly related to a positive or negative outcome. These critical incidents were later surveyed in an effort to identify whether time was saved as a result of productivity gains from the leadership skills learned through the course.

## **Participants**

In this study, we looked at the current fiscal year 2004 CPO selectees. The course was a requirement before their accession to CPO. There was also a special emphasis on the Aviation and Information Technology ratings, as requested by the sponsor.

Over 3,950 CPO selectees completed at least one evaluation after taking the course. In table 1, we show the sample sizes for each of the evaluations.

Table 1. Sample sizes

<b>Assessment</b>	<b>Number of Participants</b>
Learning	3,968
Behavior Self-Assessment Baseline	4,106
Behavior Self-Assessment Follow-up	409
Behavior Assessment by Others Baseline	3,745
Behavior Assessment by Others Follow-Up	351
Improvement and Individual Characteristics	1,203

To assess behavior change, our sample size was the number of Sailors providing both baseline and follow-up self-ratings (N = 409). Our sample size to evaluate others observations of the CPO selectees' behavior was the number of Sailors for whom we had at least one other person providing baseline and follow-up ratings (N = 351). Where multiple raters provided data for a person, the mean rating was used.

All of these data were matched to CPO personnel files that included such information as rate of promotion, ASVAB scores, gender, race, years of education, other leadership training, and rating.

## **Analysis methodology**

### **Test and assessment score changes**

To evaluate the responses to the questions, we first calculated change scores on the learning and behavior measures. Both of the scores

required a time 1 and time 2 assessment. The learning measures (pre and post) were both calculated as a percentage of possible points that a participant could score on the assessment.

For the behavioral assessment (self and other), we calculated four dimension scores that corresponded to the four leadership style dimensions that were taught through the course assessment. Six questions were asked for each dimension. We summed the scores to all the questions within each dimension to get a raw dimension score. After calculating a raw dimension score, we calculated a change score by subtracting the pre-test dimension score from the post-test dimension score. The scores are reported as a percentage.

### **Identifying variable relationships**

To evaluate the relationships between the assessments (e.g., how satisfaction can partially predict level of improvement), we hypothesized the relationships that would exist and presented a model (appendix B). Through this model, we identified how the assessment variables related to each other through hierarchical regression and correlational analysis.

### **Differences between paygrades**

To evaluate whether training had a different effect on different paygrades, we evaluated learning change data from all enlisted course participants, which included a sample from all paygrades. Sample sizes were small for the early paygrades. We ran an analysis of variance (ANOVA) and a post hoc test to identify which paygrades had a greater learning change from the pre-test to post-test.

### **Multi-rater assessment factor analysis**

We were asked to make recommendations on how to improve the existing behavioral assessment. To empirically determine how the behavioral assessment items related to one another, in order to measure the dimensions, we conducted an exploratory factor analysis. The factor analysis analyzes the relationship among items to identify underlying dimensions or "factors" in the data. This analysis was conducted using the varimax rotation method with Kaiser normalization, and principal component analysis extraction. Because the stability of

factor analysis results depends on sample size, the pre-test self-ratings of performance, which had the largest sample size, were used for the analysis.

### **Cost comparison: online vs. classroom training**

In addition, we did a cost comparison of the Ninth House SL II training and corresponding classroom leadership training for three of the paygrades. To calculate the total cost of classroom training, we accounted for student salary and course costs, including direct, activity-facility support, host support, major projects, automated data processing, depot-level repairables, curriculum developments, and communications. The Navy suggested we use Ninth House's estimate of \$75.00 per graduate plus student salary for the Ninth House course costs.



# Findings and recommendations

## Satisfaction and usefulness of the course

### CPOs liked the SLII course

To evaluate the CPO selectees' level of satisfaction with the course, in the retrospective survey we asked the CPO selectees whether they liked the course material. In general, we found that they responded in a moderately positive direction.

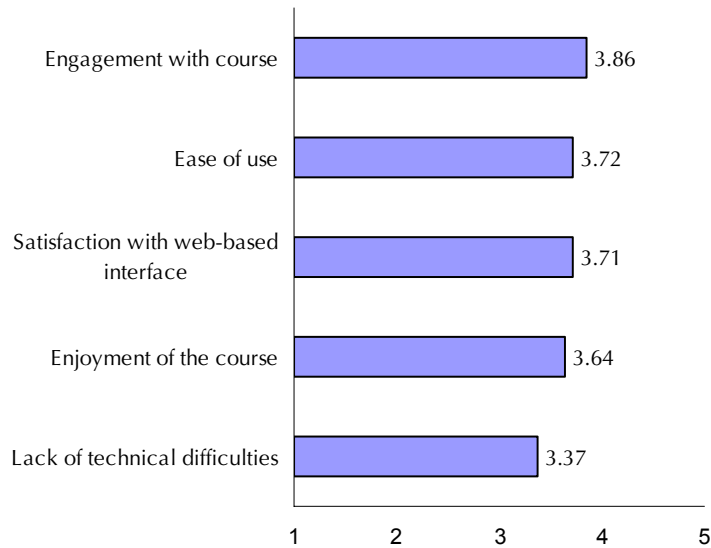
CPOs responded with the degree to which they either agreed or disagreed with the following statements:

- I found the SLII course material engaging.
- I found the SLII interface easy to use.
- I was satisfied with the web-based interface for the SLII course.
- I enjoyed taking the SLII course.
- I had no technical problems while taking the SLII course.

Using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree), CPOs reported on average a moderate agreement with all the statements (see figure 3). They agreed most strongly that they found the course material engaging. This suggests that the interactive format kept the interest of the Sailors taking the course. In addition, we found that they thought the software was easy to use and were satisfied with the web interface.

This finding is similar to previous research, which found that respondents rated the course content and interactive design features to be effective or very effective (Levi, 2004).

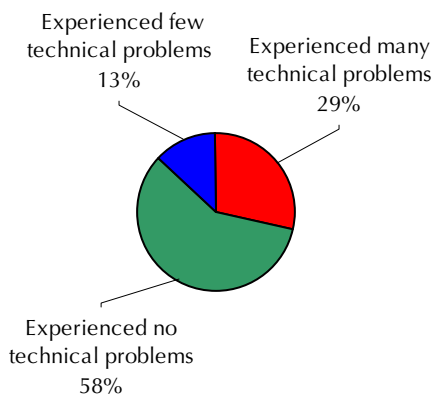
Figure 3. Average satisfaction with online SLII training course



**Lower satisfaction was due primarily to technical problems**

Respondents did not agree as strongly with the statement that they had no technical problem while taking the SLII course (mean score of 3.37). We found that 29 percent of participants said they had many technical problems while using the system (see figure 4). This is consistent with a common theme from the focus groups—that technical problems caused great frustration while taking the course.

Figure 4. Satisfaction related to technical problems



Many problems stemmed from FlashMedia installation and internet connectivity interruptions, which caused the participants to have to re-take portions of the course. Problems also occurred because participants had to wait for the course CDs (NetCD) to arrive. By the time

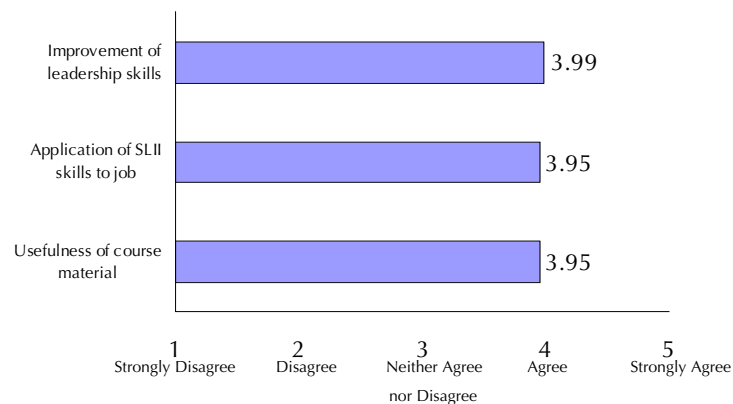


the CD's arrived, participants did not have enough time to complete the setup steps and the course material.

## CPOs found the course material useful

Since we found only moderate satisfaction with the course, we might have expected that the CPOs' response to the course's usefulness would also be moderate. To the contrary, as figure 5 shows, we found that they considered the course material to be very useful (3.96 on a 5-point scale).

Figure 5. Average utility of online SLII training course



Satisfaction and utility were related to each other ( $r = .42, p < .05$ ). We think that the degree to which they were able to use the course material affected how satisfied they were with the course material.

### Predicting satisfaction with SLII

To help identify the characteristics of a person who may find the course more satisfying, we hypothesized that motivation to learn, learning orientation, and comfort with technology would be predictors, as indicated in the model in appendix B. We ran a regression equation using these variables as predictors of satisfaction.

In accordance with our expectation, we found that those who had greater motivation to learn the course material were more satisfied

with SLII than those with less motivation ( $\beta = .18$ ). The beta weight ( $\beta$ ) is a standardized regression coefficient used to measure the amount of predictive variance holding the other variables constant. We concluded that those more motivated trainees were more engaged in the course material.

We also predicted and found that those who were more comfortable with technology were expected to be more satisfied with the use of multi-media and the technology-mediated approach to learning ( $\beta = .26$ ).

Finally, we predicted that those with a stronger learning orientation would be more satisfied because they would engage more fully with the training, worry less about errors, and explore more readily. However, in the regression model, learning orientation did not predict satisfaction when it was entered into the regression model along with comfort with technology and motivation to learn.

Although learning orientation is correlated with satisfaction, this relationship is diminished when we hold motivation to learn and comfort with technology constant. This means that learning orientation does not add to the prediction because it cannot predict satisfaction over and above comfort with technology and motivation to learn. We concluded that those who have a higher level of comfort with technology and, to a lesser degree, those who are more motivated to learn will be more satisfied with the learning material.

### **Predicting the motivation to take the course**

Similarly, we predicted that those who believed that the material would be useful for them in their job would be more interested and willing to invest effort. We found that this relationship existed ( $r = .70$ ). In practical terms, this suggests that a person will be more willing to take the course if that person perceives that the material can be used in his or her daily activities.

In summary, we found that, on average, participants in the Ninth House Situational Leadership II training course liked the course content. Technical problems were the main reason that they gave lower

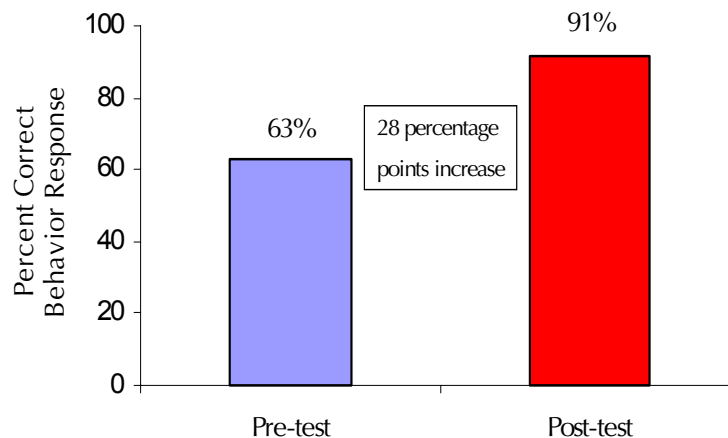
ratings to their satisfaction with the course. The participants' level of comfort with technology and their motivation to learn the course material were found to be significantly related to their level of satisfaction with the course. Finally, on average, participants found the course content to be of use in their daily activities, and this can be a strong motivator.

## Learning

### CPOs learned the course material

CPO participants demonstrated substantial learning of the SLII material by improving their scores on the learning assessment, a test measuring their ability to select the correct behavioral response to a video-based scenario. Figure 6 shows that they increased their knowledge of the material 28 percentage points on a test measuring their ability to select the correct behavioral response. Changes were statistically significant at  $p < .05$ .

Figure 6. CPOs demonstrated substantial learning of SLII material



A total of 3,968 participants completed a baseline and follow-up assessment of the learning material. The baseline assessment was done at the beginning of the training. The follow-up was done after participants had completed the training material. Both assessments used the same "workplace" scenario in which participants interacted with

characters in a film and had to decide on the correct course of action given the scenario. The same film characters were used in the baseline and follow-up assessments.

### **Predictors of learning**

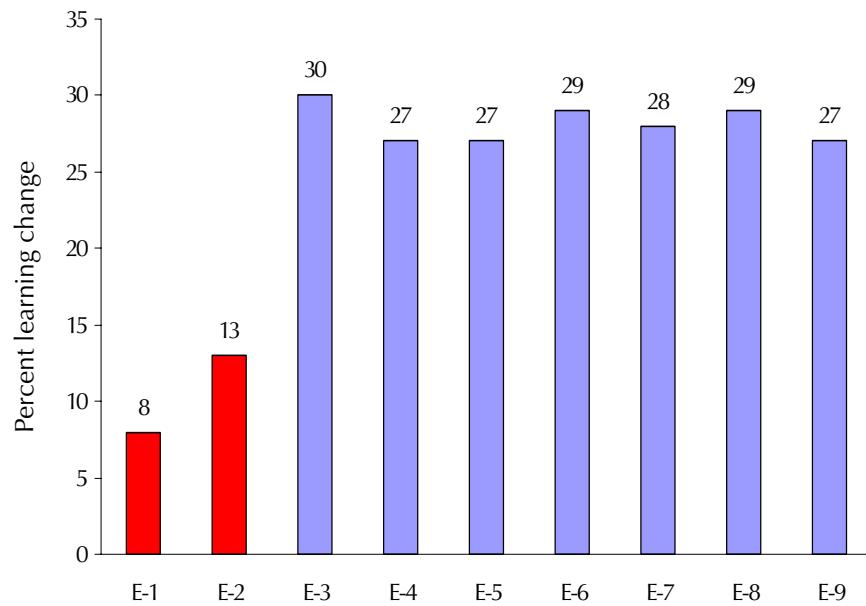
To target the audience that would get the most from the training, we hypothesized that motivation to learn, learning orientation, comfort with technology, satisfaction, and utility would all be related to learning. We expected that those with a higher level of motivation to learn would invest more effort and learn more during the training. Similarly, we expected those with a higher level of learning orientation to engage more in the training, which would result in greater learning. We suspected that those participants who were more comfortable with technology would be able to focus more on learning and not be distracted by the interface. In addition, we expected that those who were more satisfied with the training would learn more. Finally, we predicted that those who found the material more useful would learn more. However, none of these relationships turned out to be significant predictors of a CPO's level of learning. The reason for these non-significant findings is probably the low variability in the learning change score, since many participants scored very highly on both pre- and post-tests.

## **E-3s and above learned the material**

### **E-3 and above showed significant learning**

As figure 7 shows, we found that higher rates of learning were affected by paygrade. We found that E-3s learned just as much as, or more of the material when compared with their higher-paygrade colleagues. We also found that E-3s and above showed a higher learning change than the E-1 and E-2s.

Figure 7. Percentage of learning change in each paygrade



\* Differences between E-1/E-2 and all the rest were statistically significant at  $p < .05$ .

Note that sample sizes were small for the early paygrades of E-1 and E-2. However, even given the low predictive power, ANOVA results found a significant difference between these groups and others.

In addition, CPO focus group participants agreed that SLII should be offered much earlier in a Sailor's career— as soon as they begin to lead people. Depending on the command, a Sailor at the E-3 paygrade might lead people. The Navy recently changed its leadership training program to keep up with changing leadership roles and improvements to Sailors' development. This finding suggests that E-3s are good candidates for this type of training program.

## Transfer to job behavior

Both learning assessments measured the degree to which participants could pick the correct decision given a situation prompt. This measure of learning is commonly called "declarative knowledge" (i.e., "Can you identify the answer choice with the correct behavior?"). This methodology is a good way to evaluate a person's ability to

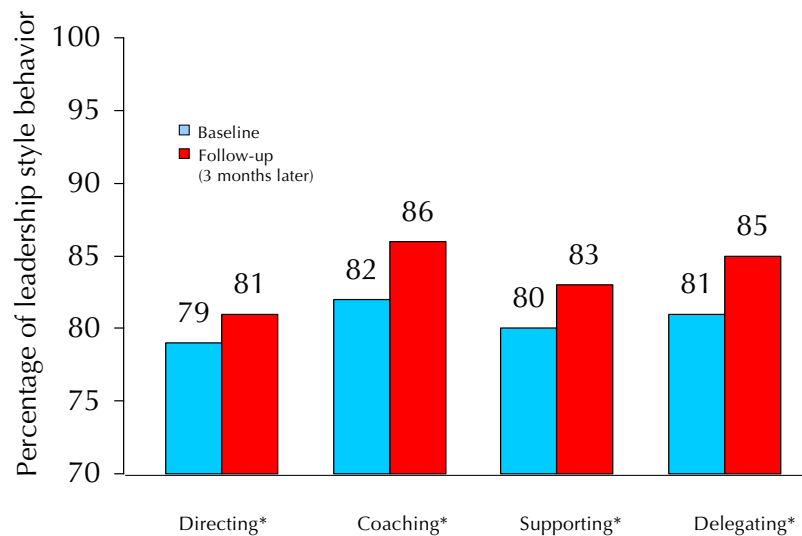
understand the material. However, it lacks the ability to adequately measure a person's ability to perform the behavior, or "procedural knowledge."

In lieu of directly evaluating the procedural knowledge, which would be difficult in an online format, the Ninth House course developers designed a multi-rater assessment of behavior. Participants rated themselves and others rated the participants on the frequency with which they exhibited the behaviors. These are the data that we used to evaluate whether participants could transfer the knowledge to the job. We found that participants did change their behavior.

### Participants had small but significant improvements in behavior

In the CPOs' self-rating, we found a very small, but statistically significant, behavior change for all four of the leadership dimensions that the SLII course intends to train. Figure 8 shows this change in each of the leadership dimensions.

Figure 8. Self-rating of behavior



\* Statistically significant at  $p < .05$ .

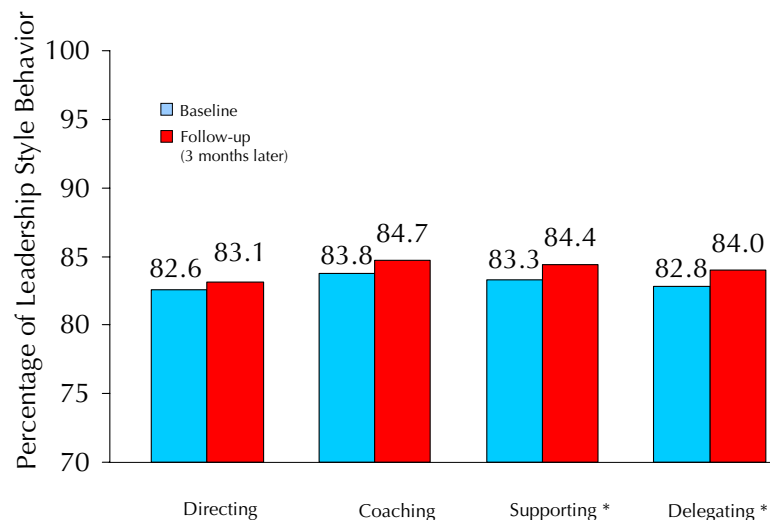
## Agreement between trainees and others about trainee’s behavior

We found that, at the baseline assessment, others rated trainees higher than the trainees rated themselves on all four SLII dimensions (Directing, Coaching, Supporting, Delegating) ( $p < .05$ ). In the follow-up assessment, others tended to rate the persons trained higher for two (Directing and Supporting) of four dimensions of the SLII course ( $p < .05$ ). With this finding, we can be more confident that the trainees did not tend to inflate their ratings of the frequency of behavior.

## Others observed more of the appropriate behaviors

Similar to the trainees’ self-rating, we found that others observed the CPOs performing the behaviors they had learned. For two of the leadership dimensions—Supporting and Delegating—the change from baseline to follow-up was statistically significant. Figure 9 shows this change.

Figure 9. Others’ behavior ratings of participants



\* Statistically significant at  $p < .05$ .

Even though these changes appear very small, we observed two independent evaluations with similar findings of positive behavior change 3 months after the training. These findings suggest that the learning “sticks.” Moreover, the learning can be transferred from the course

material to the daily activities of the Sailor. This is important because interpersonal behavior learned over years, whether appropriate or inappropriate, can be difficult to change. We found evidence that the SLII training does affect change.

Because of the absence of a control group, we can only assume that the change is due to the course. We cannot be certain that all of the change was due to the course and not to other factors that affect a CPO during the accession process.<sup>1</sup>

### **Predictors of behavior change**

Furthermore, we predicted which participants would be best able to change their behavior and transfer the knowledge to the job. We predicted that those who learned the material would show greater behavior change. We expected that those who found the material to be useful would make a greater attempt to apply the material.

In addition, we expected that those who enjoyed the course would be more apt to apply the material. However, we did not find these relationships to be significant (see appendix B). This could be partially due to low statistical power (small sample) and low variability. It could also be attributed to aspects of the measures themselves. In the next section, we will discuss how the behavioral measure could be improved, in which case, we may still expect to see the hypothesized relationships.

## **SLII assessment did not always measure intended leadership style**

The sponsor requested information on how to improve learning assessments in the future. To that end, we further examined the behavioral assessment used to measure leadership behavior change in the four leadership styles to determine whether the items were measuring the leadership dimensions they intended to measure. When creating an assessment that attempts to measure multiple

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1. Future training studies could use a control group or alternative design to determine whether behavior changes found were simply from measurement (Hawthorne effect) or from actual behavior/performance change.



dimensions (leadership styles in this case), the measure should contain items that exemplify the intended dimension and distinguish one style from another. Often, items measure unintended factors, or erroneously capture more than one dimension. This is particularly true for newly developed measures, such as the behavioral assessment employed with the Ninth House SLII training.

For an ideal measure, the factor analysis will extract as many factors as there were dimensions (in this case the four leadership styles—Directing, Coaching, Supporting, and Delegating). Ideally, each factor should consist of the items intended to measure the dimension. As the behavioral assessment consisted of four leadership styles, each measured using six items, the ideal finding would be four factors consisting of the appropriate six items.

In addition, "factor loadings" indicate the extent to which an item relates to each of the factors. Ideally, an item will have a large loading with one (and only one) factor. Items that have large loadings with multiple factors do not discriminate well between dimensions.

Results of the factor analysis did identify four factors. However, these factors were either a subset of the intended items, or included items intended to measure other dimensions.

Table 2. Results of factor analysis

<b>Leadership Style SLII Intended to Measure</b>	<b>Leadership Style We Found</b>
Directing	Half of items related to "feedback" factor with Coaching and Supporting items
Coaching	Coaching items combined with Directing and Supporting items to create "feedback" factor
Supporting	Four Supporting items combined with two Delegating items (the rest in "feedback" factor)
Delegating	Two of six items combined with Supporting

As indicated in table 2, three of the four intended factors were identified, but in a modified form. Directing was an original dimension; however, our results included only three of the six items intended to measure this leadership style. A second factor appeared to be the Supporting factor, made up of four of the six items intended to measure this style, along with two items intended to measure the Delegating style. The third factor, Delegating, was made up of four of the six items intended to measure this style.

Finally, the fourth factor appeared to be a "Feedback" factor made up of the original six Coaching items combined with three Directing items and two Supporting items. We suggest "Feedback" as the name for the factor because most of the items are related to the amount or manner in which feedback is provided. This suggests that Feedback is a key leadership behavior included in the dimensions of the assessment, but the leader's feedback approach can cloud the measurement of the leadership style. Table 3 provides the items and factors.

Table 3. Factor analysis items by dimensions

<b>Factor Analysis Items by Dimension</b>		
<b>Factor Identified</b>	<b>Intended Scale</b>	<b>Item</b>
<b>Feedback</b>	Coaching 1	Continues to provide frequent feedback on task performance.
	Coaching 6	Provides feedback about task progress.
	Coaching 3	Offers an opportunity to discuss concerns and share ideas about the task.
	Coaching 2	Finds ways to assure the person that progress is being made on the task.
	Directing 5	Acknowledges the person's progress on the task to date.
	Directing 2	Provides frequent feedback on task performance.
	Coaching 5	Continues to praise the person for development on the task so far.
	Coaching 4	Listens in an acceptant manner.
	Directing 1	Provides concrete steps for performing the task.
	Supporting 1	Serves as a sounding board, encouraging a discussion of concerns and ideas.

### Factor Analysis Items by Dimension

Factor Identified	Intended Scale	Item
<b>Supporting</b>	Supporting 2	Encourages self-reliant problem solving with regard to the task.
	Supporting 5	Provides support while learning continues on the task.
	Supporting 6	Communicates a solid rationale for the importance of the task.
	Supporting 4	Reassures the person of success on the task.
	Delegating 2	Expresses appreciation for contributions to the organization.
<b>Delegating</b>	Supporting 3	Provides praise for accomplishment on the task so far.
	Delegating 4	Provides opportunities to share in successes on the task.
	Delegating 5	Lets the person take the lead in goal setting regarding the task.
	Delegating 3	Lets the person take the lead in decision making on the task.
	Delegating 6	Rewards contributions to the organization through performance on the task.
<b>Directing</b>	Delegating 1	Challenges the person to even higher levels of performance on the task.
	Directing 3	Makes most of the decisions about how to perform the task.
	Directing 6	Takes the lead in the action planning regarding the task.
	Directing 4	Provides specific task instructions.

For example, in the current assessment, the item intended to measure Directing reads, "Provides frequent feedback on task performance," while an item intended to measure Coaching reads "Provides feedback about task progress." Thus, essentially the same behavior on the part of the leader would lead to higher ratings on both scales.

In addition to feedback, other items captured behavior that did not distinguish one leadership style from another as intended. This was indicated by nearly equal factor loadings with multiple factors (see appendix C). For example, "Encourages self-reliant problem solving" had the highest loading with the Feedback factor, but it was almost as

highly related to the Supporting factor it was intended to measure. The Supporting item, "Provides praise for accomplishments on the task so far," was almost as highly related with the Feedback factor as it was to the Supporting factor. The item, "Provides an opportunity to share in successes on the task," was almost as highly related to the Supporting factor as it was to the Delegating factor it was intended to measure.

To improve the assessment, it is necessary to create items for each dimension that capture the behavior best defining the dimension, and only that dimension. Developers should avoid behaviors that can readily be interpreted as relating to more than one leadership style. Likewise, since the appropriate behavior is keyed by the situation in this leadership theory, a stronger situational prompt might help raters to distinguish ratings of similar behaviors where appropriate. In addition, we would suggest the consideration of measures that go beyond simply the frequency of behavior (how often a behavior is done), to ask about the effectiveness of the behavior.

### **Groups appeared to benefit equally from the course**

We found no significant differences in the amount that the participants learned or changed their behavior across groups. We compared groups across:

- Gender
- Race
- Years of education
- Rate of promotion
- ASVAB verbal score
- Other leadership training
- Rating: Aviation, Information Technology, and Engineering.

We can conclude that participants in these subcategories improved equally in both the learning and behavior change measures.

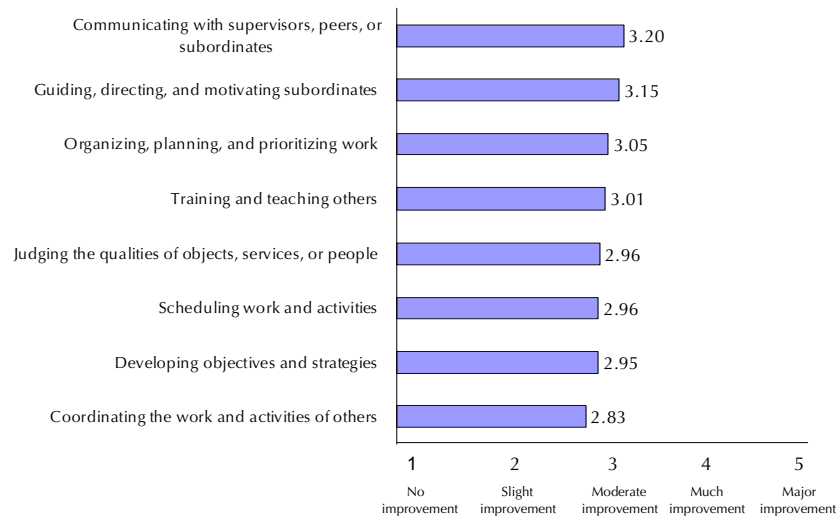
## Performance improvement

### Participants showed indicators of moderate improvement

As mentioned in the methodology section, we evaluated leading indicators of performance improvement using a retrospective survey of the participants' beliefs. We used a number of measures—some general and some specific. To evaluate general performance improvement, we asked each participant the degree to which they were able to improve their performance in eight leadership areas that were found through previous research to be part of an enlisted Sailor's work.

As figure 10 shows, we found that the CPO selectees suggested that they were able to communicate with supervisors, peers, or subordinates better since the SLII training. Similarly, they were better equipped to guide, direct, and motivate subordinates. The findings are relevant because the SLII course emphasizes the correct communication techniques given the situation. It also emphasizes how and when to guide, direct, and motivate subordinates. The least improvement came in the area of coordinating work and activities. This is not surprising because managing other's time and prioritizing another's work was not a focus of this leadership training. However, the slight improvement is probably a side effect of delegating at the appropriate times, which is part of the training objectives.

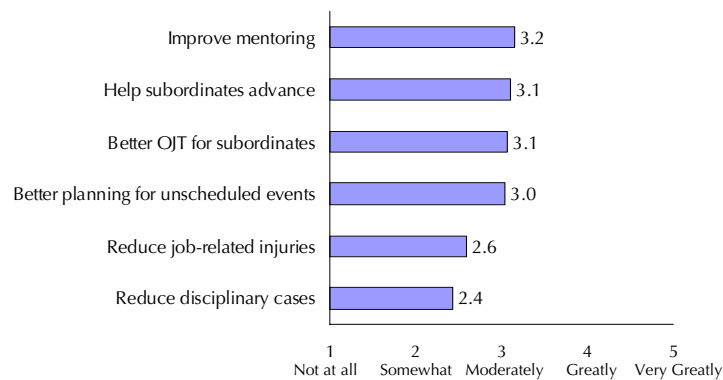
Figure 10. Improvement by leadership category



## Effects of SLII course on subordinate management

Concurrently, we evaluated some Navy-specific job outcomes that are related to leadership effectiveness. We asked the CPO selectees if they were better able to reduce job-related injuries, reduce disciplinary cases, improve mentoring, help subordinates advance, provide better on-the-job training (OJT), and better plan for unscheduled events. In all cases, the CPO selectees suggested that they had made slight to moderate improvements in these important areas. Rising to the top in job-related outcomes were mentoring, OJT, helping subordinates advance, and planning for unscheduled events. However, it was unexpected that this type of training could also help them reduce job-related injuries and disciplinary cases. We might deduce that by being a better leader in given situations, one could manage conflict more easily and could make the workplace safer. Future replication could use measurable outcomes of these data. Figure 11 shows the mean scores reported in these areas.

Figure 11. Effects of SLII course on subordinate management

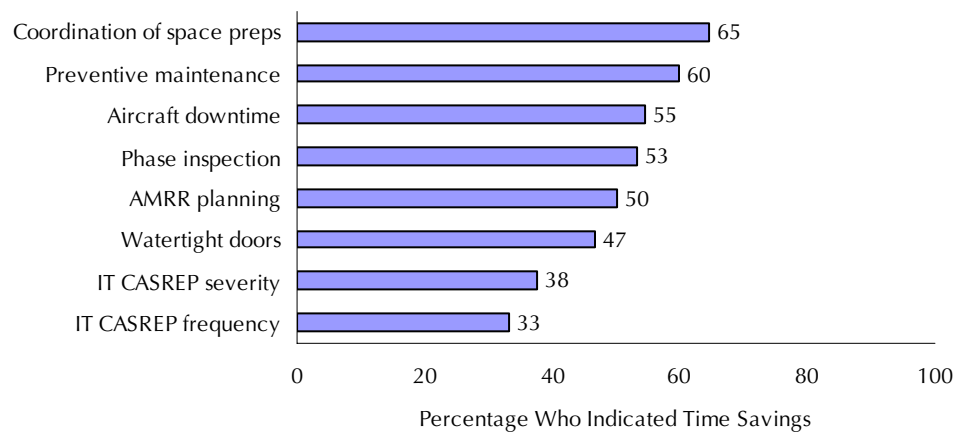


## Aviation and IT CPOs indicated time savings from SLII

We looked more specifically at the Aviation and Information Technology ratings. Through focus groups that we conducted prior to survey deployment, we identified “critical incidents” or specific real-life examples of times when a Sailor’s leadership had resulted in positive or negative outcomes. Leading CPOs in both ratings gave us examples of times when leadership had affected the coordination of space

preparations, preventive maintenance, aircraft downtime, phase inspection, Aviation Maintenance Readiness Report planning, and installation of water-tight doors (for Aviation) and casualty report (CASREP) severity and frequency (for Information Technology). We found that in many cases, over 50 percent of CPO selectees believed that as a result of the training they were able to save time in these areas. Figure 12 shows the break down of the percentage of participants who indicated time savings in each of the job outcomes.

Figure 12. Percentage of participants indicating time savings



### Predictors of improvement

As we did with each of the evaluations, we looked at what might predict greater improvement in the eight primary leadership areas.

We predicted that those who changed their behavior more as seen by others and as perceived by the trainee would indicate that they had improved more in leadership work functions. However, this relationship was not present. This finding is possibly due to the limitations of the behavioral assessment measures and a relatively low effect size.

We also expected that those who liked the training more and those who found the material useful would indicate that they had demonstrated more improvement in leadership work functions. We found that both satisfaction ( $\beta = .12$ ) and utility ( $\beta = .45$ ) were significant predictors of performance improvement indicators when run together in the regression equation.

## Cost comparison

We evaluated the SLII training costs against similar leadership training courses that are currently in the enlisted curriculum. Since we do not have any outcome data from the classroom courses, we did our evaluation on cost alone.

We compared the Ninth House training against similar Enlisted Professional Development Functional Skill Training. The Navy recently introduced a new leadership training curriculum for enlisted Sailors; however, course cost data were not available for the new training courses. The course cost comparisons are based on FY02 training course costs and student salaries. We evaluated the 2002 training programs that were in closest alignment to the new training programs in terms of curriculum and length.

In calculating the total costs of the brick-and-mortar courses, we included military, civilian, and contract direct, support, major projects, automated data processing support, depot-level repairables support, curriculum development, and communication costs (NETP-DTC, 2002). We also included the students' salaries. We did not include travel, lodging, and per diem since this type of training is usually completed near the Sailors' command.

The Navy suggested we use Ninth House's estimate of \$75 per graduate for the Ninth House course cost. We also included the student salary in the calculation. Given the Navy's enterprise license to the software, however, the more participants that take the course, the less the cost per graduate.

Of the three for which we compared costs, we found that for two courses, the Petty Officer First Class and Chief Petty Officer Indoctrination, the Ninth House SLII course was cheaper in an hour-for-hour comparison (see table 5). In comparison to the Petty Officer Second Class Indoctrination course, the Ninth House course was a little more expensive per graduate. Table 5 shows the costs of all these courses, for comparison.



Table 4. Leadership training course costs

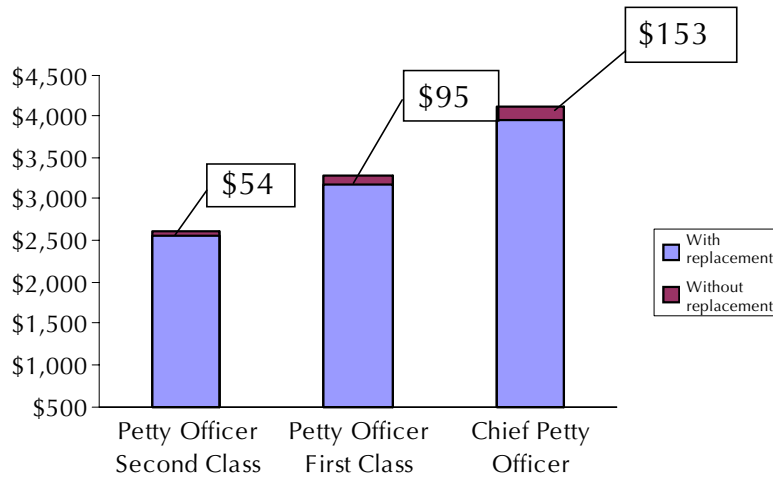
	<b>Cost/ Person</b>	<b>Hours</b>	<b>Cost/ Hour</b>	<b>Salary/ Hour</b>	<b>TotCost/ Hr</b>	<b>Grads</b>
<b>PO2 Leadership Course -0025</b>	<b>\$2,597.60</b>	<b>80</b>	<b>\$10.59</b>	<b>\$21.88</b>	<b>\$32.47</b>	<b>4825</b>
<b>Ninth House</b>	<b>\$206.28</b>	<b>6</b>	<b>\$12.50</b>	<b>\$21.88</b>	<b>\$34.38</b>	
<b>PO1 Leadership Course -0025</b>	<b>\$3,266.40</b>	<b>80</b>	<b>\$14.70</b>	<b>\$26.13</b>	<b>\$40.83</b>	<b>2875</b>
<b>Ninth House</b>	<b>\$231.78</b>	<b>6</b>	<b>\$12.50</b>	<b>\$26.13</b>	<b>\$38.63</b>	
<b>CPO Leadership Course - 0021</b>	<b>\$4,112.00</b>	<b>80</b>	<b>\$20.86</b>	<b>\$30.54</b>	<b>\$51.40</b>	<b>1110</b>
<b>Ninth House</b>	<b>\$258.24</b>	<b>6</b>	<b>\$12.50</b>	<b>\$30.54</b>	<b>\$43.04</b>	

### **Option 1: Replace portion of traditional course with SLII**

After talking with the Center for Naval Leadership about the existing leadership training courses, we determined that 1 day of classroom training is devoted to the SLII course material. Similarly, we asked focus group participants how many days of classroom training would be required to get the same practice and learning as the Ninth House SLII course. We generally heard that the training would take anywhere from 3 days to 2 weeks. In an effort to use a conservative estimate, we are using 1 day, which is less than the focus groups' lower bound and about the same time that is currently devoted to SLII through traditional classroom training.

Figure 13 shows the estimated cost savings gained from replacing 1 day of traditional classroom training with the Ninth House course. We found that the largest variable in training cost is the students' time. In addition, we found that the later in their careers the students take the course, the more expensive both training programs become.

Figure 13. Cost comparison when 1 day of an existing course is replaced with SLII



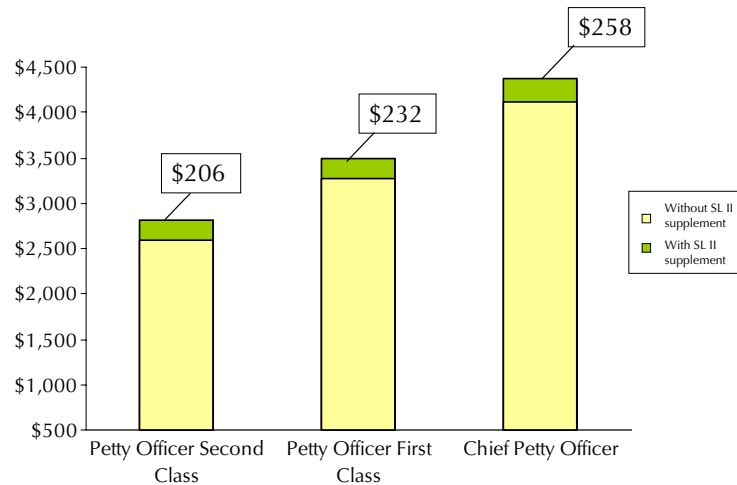
In general, there is a small savings from using the SLII training course. However, since the savings is small and we have heard from focus group participants that the course would be a very good supplement to the existing classroom learning, we will look at what the course cost would be if SLII were added to the current curriculum.

### Option 2: Supplement existing classroom training with SLII

Next, we calculated what the additional cost would be for the indoctrination courses for PO2, PO1, and CPO. These courses are most similar to the new FLLDP, PLDP, and ALDP courses, respectively.

The total SLII course costs for a Petty Officer Second Class is \$206, for Petty Officer First Class is \$232, and for the Chief Petty Officer is \$258. Figure 14 shows the total cost per graduate for a proposed curriculum that uses SLII as a supplement to the classroom training.

Figure 14. Cost to supplement existing course with SL II



Clearly SLII training costs less if the Sailor takes the course early in his/her career. Also, in earlier analysis, we found that E-3 Sailors perform as well as, or better, than Sailors taking the course later in their careers.

## Recommendations

Based on our findings, we make the following recommendations:

- **Continue to use Ninth House Situational Leadership II course for training Navy leadership.** From the data available through multiple surveys and focus groups, we recommend that the Navy continue to use the Ninth House SLII training course to train its leadership. We found that Sailors learn the material, transfer the learning to the job, and show indicators of improvement in key leadership areas. In addition, the Sailors find the course material to be useful to their job and somewhat enjoyable.
- **Promote full participation starting at the E-3 paygrade.** E-3s have a much stronger propensity to learn the course material than their E-2 and E-1 counterparts. Also compared to trainees at more senior paygrades, E-3s learn the material at the same

level or higher. We recommend promoting the course to Sailors in leadership positions at paygrade E-3 and above.

- **Supplement the First Line Leadership Development Program with SLII.** Our recommendation is to supplement the First Line Leadership Development Program (FLLDP) course with the SLII training. The course costs will be lower than at the CPO level because of the cost of the Sailor’s time. This course could be taken in conjunction with FLLDP for Sailors who are responsible for directing and developing subordinates.
- **Improve behavioral assessment to better measure effective situational leadership behaviors and to assist in providing appropriate feedback.** We recommend modifying the behavioral assessment to better evaluate training effectiveness. Moreover, this modification will help provide better feedback to Sailors about the leadership skills and provide clues on where they can improve. Here are some suggestions we provided based on factor analysis of the existing assessment:
  - Capture behaviors that best define dimensions. Clarify the behavior that relates to each dimension.
  - Reduce items that represent more than one dimension.
  - Create stronger situation prompts.
  - Consider using assessment scales that measure more than just frequency of behavior (e.g., effectiveness). Behaviorally Anchored Rating Scales (BARS) would indicate effective vs. ineffective behavior rather than just the frequency of behaviors. BARS also would help identify more objective measures of performance that we would expect to be affected by the SLII course.
  - Consider using alternative methodologies (e.g., Post/Then) that allow Sailors to reflect on their behavior after the training and then again 3-6 months later (Martineau & Hannum, 2004). We also recommend identifying the “other” respondent type (peer, subordinate, supervisor). This would make it easier to distinguish between self per-

ceptions of improvement and others' observations of a participant's behavior.

- Finally, we recommend encouraging follow-up participation. The follow-up evaluation is critical to understanding a Sailor's improvement.



## Appendix A: Effects of online SLII training course

**Table 5. Effects of online situational leadership training course**

<b>Variable</b>	<b>Category</b>	<b>Survey Question<sup>a</sup></b>	<b>Mean</b>	<b>S.D.</b>
<b>Effects of Training</b>	Effects on Training and Teaching	As a result of the SLII training, are you better prepared for training and teaching sailors who need OJT?	3.159	1.098
	Effects on Thinking and Planning	As a result of the SLII training, are you better able to think through and plan for unscheduled events?	3.102	1.066
	Effects on Mentoring	As a result of the SLII training, have you improved your ability at mentoring sailors?	3.209	1.128
	Effects on Discipline	As a result of the SLII training, have you reduced disciplinary cases?	3.453	1.861
	Effects on Readiness to Help Subordinates	As a result of the SLII training, are you better prepared to help your subordinates advance?	3.208	1.190
	Effects on Job-Related Injuries	As a result of the SLII training, have you been able to reduce injuries on the job?	3.864	1.914

a. Questions from online Retrospective Survey can be found at [http://www.competencymap.org/nologin/survey\\_direct2.php?xml=survey\\_rh.xml](http://www.competencymap.org/nologin/survey_direct2.php?xml=survey_rh.xml)

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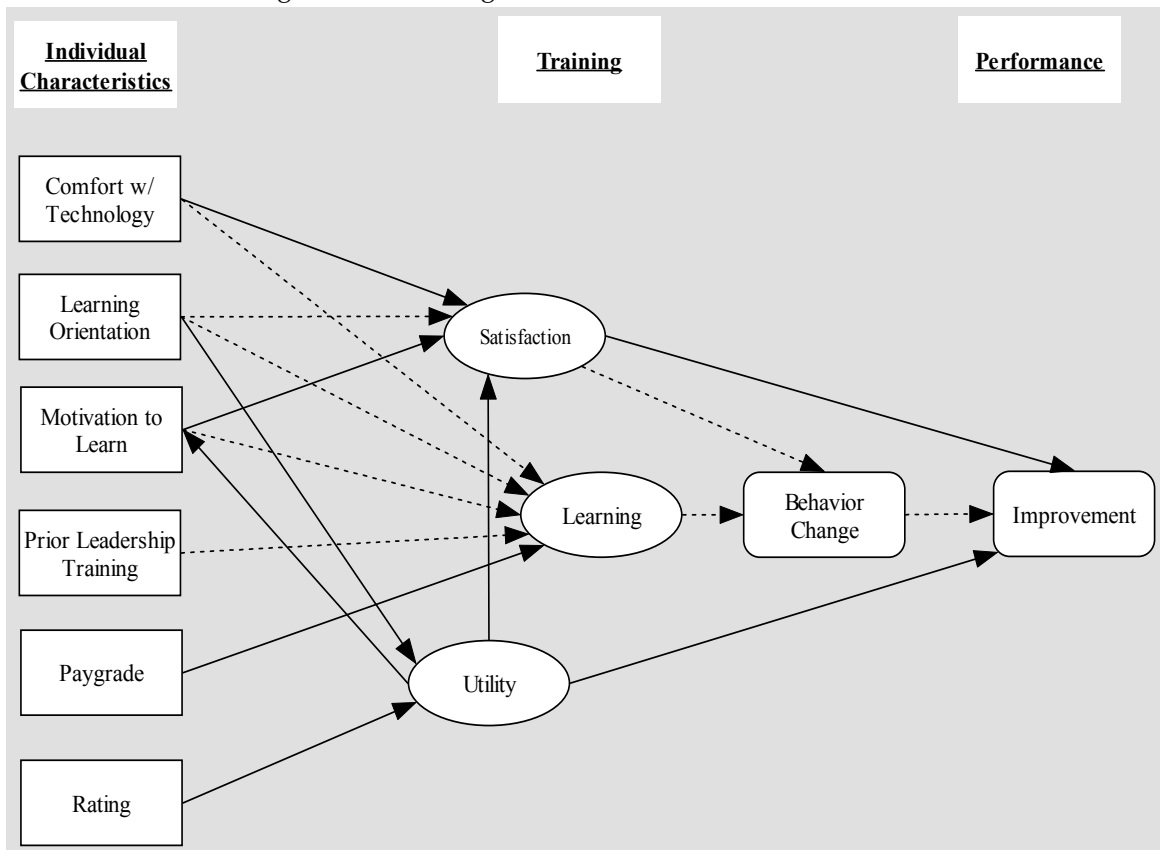


# Appendix B: Theoretical model

## Variable relationships

Figure 15 is a theoretical model of how the variables in this study relate to each other. Solid black lines indicate a relationship that was predicted and found to be statistically significant. Dotted lines indicate relationships that were hypothesized, but not found to be significant.

Figure 15. Training Effectiveness Model





## Appendix C: Factor Loadings

Table 6. Factor loadings for each item

Item	Factor Loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
Coaching 1	<b>0.690</b>	0.164	0.199	0.135
Coaching 6	<b>0.676</b>	0.397	0.166	0.066
Coaching 3	<b>0.669</b>	0.264	0.224	0.005
Coaching 2	<b>0.653</b>	0.228	0.201	0.082
Directing 5	<b>0.635</b>	0.264	0.141	0.216
Directing 2	<b>0.607</b>	0.182	0.102	0.218
Coaching 5	<b>0.582</b>	0.429	0.141	-0.002
Coaching 4	<b>0.562</b>	0.293	0.125	0.013
Directing 1	<b>0.534</b>	-0.007	0.169	0.410
Supporting 1	<b>0.528</b>	0.461	0.173	0.031
Supporting 2	<b>0.470</b>	0.421	0.272	0.088
Supporting 5	0.323	<b>0.741</b>	0.181	0.117
Supporting 6	0.240	<b>0.724</b>	0.129	0.210
Supporting 4	0.334	<b>0.712</b>	0.170	0.101
Delegating 2	0.345	<b>0.549</b>	0.393	0.049
Supporting 3	0.529	<b>0.538</b>	0.174	0.034
Delegating 4	0.072	<b>0.422</b>	0.418	0.189
Delegating 5	0.231	0.154	<b>0.815</b>	0.030
Delegating 3	0.234	0.138	<b>0.790</b>	-0.016
Delegating 6	0.314	0.471	<b>0.542</b>	0.072
Delegating 1	0.184	0.426	<b>0.474</b>	0.131
Directing 3	0.050	0.121	-0.006	<b>0.805</b>
Directing 6	0.098	0.185	0.032	<b>0.804</b>
Directing 4	0.475	0.014	0.146	<b>0.515</b>



## Appendix D: Results of online SLII training course survey

**Table 7. Utility, satisfaction, motivation, learning orientation, comfort with technology**

<b>Variable</b>	<b>Category</b>	<b>Survey Question<sup>a</sup></b>	<b>Mean</b>	<b>S.D.</b>
<b>Utility</b>	Usefulness of Course Material	I felt the SLII course material was useful.	3.953	0.785
	Application of SLII Skills to Job	I could see how I might apply the SLII skills on the job.	3.985	0.760
	Improvement of Leadership Skills	I believed that the SLII course could improve my leadership skills.	3.951	0.784
	Aggregate Utility of the SLII Course		11.889	2.091
<b>Satisfaction</b>	Satisfaction with Course	I enjoyed taking the SLII course.	3.640	0.957
	Involvement with Course	I found the SLII course material engaging.	3.855	0.860
	Satisfaction with Web-based Interface	I was satisfied with the web-based interface for the SLII course.	3.715	0.985
	Lack of Technical Difficulties	I had no technical problems while taking the SLII course.	3.369	1.177
	Easy of Use	I found the SLII interface easy to use.	3.725	0.912
	Aggregate Satisfaction with Course		18.304	3.737
<b>Motivation</b>	Desire to Learn Leadership Skills	I wanted to learn the skills in the SLII program.	3.906	0.760
	Interest in Course Material	I was interested in the SLII material.	3.888	0.785
	Effort Exerted for Course	I tried my best to learn the SLII material.	4.125	0.676
	Aggregate Motivation to Learn		11.919	1.846
<b>Learning Orientation</b>	Preference for Learning New Things	I prefer to work on tasks that force me to learn new things.	3.850	0.728

**Table 7. Utility, satisfaction, motivation, learning orientation, comfort with technology**

<b>Variable</b>	<b>Category</b>	<b>Survey Question<sup>a</sup></b>	<b>Mean</b>	<b>S.D.</b>
	Effort to Improve Past Performance	I try hard to improve on my past performance.	4.316	0.602
	Importance of Extending Range of Abilities	The opportunity to extend the range of my abilities is important to me.	4.362	0.602
	Aggregate Learning Orientation		12.528	1.486
<b>Technology</b>	Frequent Use of Current Technology	I frequently use the internet to accomplish my work.	3.828	0.978
	Interest in New Technology	I like to use the latest gadgets.	3.800	0.920
	Preference for On-Line Learning	I prefer on-line learning to attending classroom training.	3.007	1.180
	Comfort with Multi-media	I'm comfortable using multi-media.	4.037	0.759
	Aggregate Comfort with Technology		14.673	2.859

a. Questions from online Retrospective Survey can be found at [http://www.competencymap.org/nologin/survey\\_direct2.php?xml=survey\\_rh.xml](http://www.competencymap.org/nologin/survey_direct2.php?xml=survey_rh.xml)

## Appendix E: Lower satisfaction was due primarily to technical problems

Table 8. Lower satisfaction was due primarily to technical problems

No Technical Problems		
	Frequency	Valid Percent
Strongly Disagree	83	6.90
Disagree	267	22.20
Neither Agree Nor Disagree	153	12.71
Agree	523	43.48
Strongly Agree	177	14.71
<b>Total</b>	<b>1203</b>	<b>100</b>





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