1990

The influence of behavior modeling and experience on the acquisition of computer skills

Mario Enrique Baeza

Follow this and additional works at: https://scholarworks.lib.csusb.edu/etd-project

Part of the Educational Psychology Commons

Recommended Citation

Baeza, Mario Enrique, "The influence of behavior modeling and experience on the acquisition of computer skills" (1990). Theses Digitization Project. 588.
https://scholarworks.lib.csusb.edu/etd-project/588

This Thesis is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.
THE INFLUENCE OF BEHAVIOR MODELING AND EXPERIENCE ON THE
ACQUISITION OF COMPUTER SKILLS

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Psychology

by
Mario Enrique Baeza
June 1990
THE INFLUENCE OF BEHAVIOR MODELING AND EXPERIENCE ON THE
ACQUISITION OF COMPUTER SKILLS

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

by
Mario Enrique Baeza
June 1990

Approved by:

Dr. Janet L. Kottke, Psychology

Dr. Matt Riggs, Psychology

David Neighbours, Associate Director
Instructional Computing
ABSTRACT

The influence of behavior modeling techniques and participant's previous experience were examined in this study. Participants were 64 men and women. A behavior modeling approach yielded higher performance on a post-performance test. Previous computer experience affected performance outcomes. Self-efficacy was predicted to be higher for participants in the behavior modeling session when compared to the tutorial sessions, but no support was found for this hypothesis. Findings and implications of this study are discussed in terms of influences on training methods and participants.
ACKNOWLEDGEMENTS

I would like to thank my committee chairperson Janet L. Kottke, Ph.D for her expertise, support, and guidance in completing this thesis. I would also like to thank my other committee members Matt Riggs, Ph.D and David Neigbours, Associate Director of Instructional Computing, for their support and consultation.

I would also like to give special thanks to God and to my parents for their love and support in overcoming the many obstacles in completing my education and thesis.
TABLE OF CONTENTS

Title................................................................. i
Signature Page.................................................. ii
Abstract........................................................... iii
Acknowledgements.............................................. iv
List of Tables.................................................... vii
Literature Review................................................ 1
  Interactive Disk Tutorials................................. 1
  Behavior Modeling............................................. 3
  Hypothesis 1..................................................... 6
Experience.......................................................... 7
  Hypothesis 2..................................................... 8
Self-Efficacy....................................................... 8
  Hypothesis 3..................................................... 9
Method.............................................................. 9
  Participants.................................................... 10
  Procedure....................................................... 10
Results............................................................ 13
  Sample.......................................................... 13
  Measurement................................................... 13
    Experience Scale............................................. 13
    Anxiety Scale............................................... 13
    Self-efficacy Scales........................................ 14
LIST OF TABLES

Table 1. Post-training performance means and standard deviations by experimental session ...................... 15

Table 2. Pearson correlations coefficients of self-efficacy scores with performance test and computer anxiety ...... 17
Literature Review

Computers have become a vital component of success in almost any field of business. To become a "computer literate" is almost as important as learning the traditional skills of reading, writing, and arithmetic. However, businesses find that many job applicants do not have the skills necessary to operate the ubiquitous microcomputer. Hence, large sums are spent to train employees how to use computers.

Many methods of training are available (cf. Goldstein, 1986) to business, but two stand out in their applicability for computer training: one method is behavior modeling; the other is the interactive disk tutorial. Though little research has been conducted on these training approaches there is some background for both.

Interactive Disk Tutorials

Interactive tutorials are pre-packaged with most word processing and spreadsheet software programs. The user simply follows the on-screen instructions that demonstrate several key features in operating that particular program. Since they are included in the software package they are virtually free of charge. Interactive tutorials are self-pacing so that the user can take a step-by-step learning approach and become familiar with the program with some
privacy. Other advantages of using interactive tutorials are hands-on experience and quick feedback. For example, the user views a brief description on a particular keystroke function. The tutorial then instructs the user to perform the keystroke in question. If the user performs it correctly the tutorial rewards him with a correct statement. If the response is incorrect the user cannot advance until the mistake is corrected.

Interactive tutorials are examples of computer assisted instruction (CAI). With the advent of microcomputers the applications of CAI are widespread and diverse. CAI has been utilized in the military, industry and education. In education CAI has aided in teaching biology, athletics, and arithmetic. It has also been used to teach the mentally retarded an array of different subjects. CAI has also been applied to police science. Wilkenson and Chattin-McNichols (1985) examined the effects of CAI in training police officers. They found that the success of CAI was directly related to successful performance. One study, however, found no difference between CAI training and other lower-technology based instructional systems in regards to electromechanical maintenance training (Swezey, Perez and Allen, 1988).
In industry, there are five kinds of applications software the personal computer made available. They are wordprocessing, spreadsheets, data management, communications, and graphics (Ribler, 1985). Though CAI has been widely used the research on its effectiveness in regards to computer training in industry is virtually nonexistent.

Behavior Modeling Tutorials

Though the behavior modeling approach is more expensive and time consuming than the interactive disk tutorial it is believed to have advantages. A videotape is presented interactively with the disk tutorials. Videotape presentations combined with computer exercises of the tutorial approach are believed to be more effective than with no exercises (Kraut, 1976). In this approach participants observe a model perform a certain task and they, in turn, imitate the model on their own computer. Observing the computer process gives the participants a coherent reference providing feedback as well as reinforcement.

Social learning theory is the basis for behavior modeling (Bandura, 1971). Succinctly stated, Bandura emphasized vicarious learning in which people learn by imitating behaviors of others without actually receiving
any immediate observable reward. Learning occurs when we observe other people's behavior and its consequences for them. Goldstein and Sorcher (1974) first introduced the concept of applying behavior modeling to training. At the onset, the concept was widely applied to many facets of the job, including behavior on the job, performance, and learning.

According to Goldstein (1986) researchers developing new methods of training this decade generated the most excitement for behavior role modeling. There were early studies that supported the idea that behavior modeling improved certain job related behaviors such as acquiring new skills. Byham, Adams, & Kiggins (1976) investigated the transfer of the acquisition of a new on-the-job skill of improved superior/subordinate interactions by imitating a movie model. They found that the acquisition of the new skill was successful. Additional support for this type of training effectiveness was found by Moses and Ritchie (1976).

Studies also support a positive change in performance as a result of behavior modeling (Davis and Mount, 1984; Latham and Saari, 1979; Meyer and Raich, 1983; Moses, 1978; Smith, 1976). Russell et. al. (1984) examined several aspects of behavior modeling and found that modeling provides a good base for learning. Decker (1979) found
behavior modeling effective in teaching skills to adults in counseling sessions. Gist, Rosen, & Schwoerer (1988) examined the effects of behavior modeling on acquiring computer skills. They found this approach to be effective.

Although many studies have supported the superiority of behavior modeling others have not. Russell, Wexley, & Hunter (1984) failed to find a change in performance. And, there have been studies that failed to support a change in behavior when behavior modeling was applied (Brunsaka, 1976; Russell et. al. 1984). Criticisms of these earlier studies have been argued by McGehee and Tullar (1978). They point out that behavior modeling in a work setting leaves some doubt about causality and transfer of training to the job. These critics believe that there was no change because the participants were not required to practice or use the new behaviors on the job. Unfortunately none of these studies assessed computer performance.

The need to train employees more effectively has always been a concern for the practitioner. Computer literacy is fast becoming an essential aspect of many occupations. Training methods have not been examined thoroughly to assess their effectiveness in order to develop a more proficient computer workforce. Little research has focused upon the benefits of behavior modeling
applications computer training. This study examines the potential that behavior modeling has in acquiring computer skills.

This study is a replication of both Gist et. al. (1988) and Gist, Schwoerer, & Rosen (1989), but will differ in some ways. The training course lasted approximately two hours as opposed to Gist's training of three hours. This time factor may be critical to the effectiveness of the methods utilized. The first Gist study was concerned mainly with age while the second with self-efficacy. Although experience was used as a covariate it will be of major importance in this study. Age will be solicited but was not of primary importance, Gist did not find it to be a factor. Due to equipment limitations the arrangement of the room will not be the same. In the Gist studies each participant possessed a monitor and printer. In this study the printers will be located in the back of the room. Another major difference between the studies is that this study will examine only software efficacy and use it as a post-training measure as opposed to using it mid-session. This timing of this measure may have a direct bearing on the amount of self-efficacy assessed of the participants.

Hypothesis 1: Post-training performance will
be higher in the behavior modeling tutorial than in the interactive disk or video tutorial sessions.

Experience

A survey of the psychological literature revealed surprisingly few studies that examined the relationship of experience and performance. These studies revealed mixed results. Mosel (1952) investigated training and experience ratings on job performance. He found that experience ratings were poor predictors of job performance. On the other hand, Giniger, Dispenzieri, and Eisenberg (1983) examined experience as it related to worker productivity. Experience rather than age predicted performance. McDaniel and Schmidt (1985) found that experience was a weak predictor of performance. McEnrue (1988) studied managers in the early stage of their careers to determine if experience was related to their performance. She found a strong positive relationship between length of experience and their performance. Hunter and Hunter (1984) conducted a meta-analysis of cumulative research on various predictors of job performance, including performance. They found that experience had a mean validity of .18 with performance. The meta-analysis suggested that length of experience and cognitive complexity appears to moderate the
correlation between job experience and job performance. Support was also obtained by another meta-analysis conducted by McDaniel, Schmidt and Hunter (1988). Taken together, these data suggest computer experience should be a factor in successful completion of the training sessions.

**Hypothesis 2: Participants with more experience will have higher scores on the post-test.**

**Self-efficacy**

Bandura (1986) defines self-efficacy as a judgement of one's capability to accomplish a certain level of performance. It has been found that people with higher levels of self-efficacy perform better than those with low levels of self-efficacy (Barling & Beattie, 1983,; Taylor, Lock, Lee, & Gist, 1984). Unfortunately, none of these studies examined behavior modeling techniques.

Literature on behavior modeling and self-efficacy have both been positive, but only one previous study examined the relationship between the two. Gist, Schwoerer, and Rosen (1989) investigated the relationship of self-efficacy and behavior modeling. They found that participants exhibited higher self-efficacy for the use of software than for participants in the tutorial condition.
According to Bandura (1986) self-efficacy is believed to develop from a progressive achievement of skills over a length of time. Moreover, watching a model perform the task has also influenced learning of skills (Bandura, 1982).

How this phenomena occurs, however, has not been examined in great detail. Operating on the principle of vicarious learning participants in the behavior modeling session should develop higher self-efficacy. By watching someone else successfully complete a task this may, in turn, build confidence for the participants in the behavior modeling session. Modeling is expected to increase performance, so a measure of self-efficacy should be related to the score on the post-performance test. Currently, there is no other study besides Gist et. al. (1989) that has examined self-efficacy as it influences behavior modeling. The present study will investigate this relationship.

Hypothesis 3. Participants in the behavior modeling session will develop higher self-efficacy scores than those in the other two sessions.

Method

Students at a Southwestern university were recruited
through announcements made to classes. Students were notified that they would receive extra credit in their course for participating in a new three-hour training program in the use of a spreadsheet software program.

Participants

The participants were asked to complete a pre-training questionnaire that inquired about the following: age, gender, computer experience, and if so, if that computer experience included any software knowledge. Those students who had prior experience with any release of any spreadsheet program were excluded from the study. The plan of this study was to assess the effectiveness of several methods in acquiring new computer skills, not reinforcing old ones. After the training session, self-efficacy scales were administered in this order: issuing commands, constructing formulas, following models, and saving worksheets. Because previous research has suggested anxiety may affect computer learning the participants completed a computer anxiety index before training. This instrument was developed by Maurer (1983) to measure computer anxiety.

Procedure

Participants were randomly assigned to the interactive tutorial, video tutorial, or the behavior modeling
tutorial. Participants were asked to sign-up for a training session on a particular day and time. Participants had no indication which method they were to participate in. The sessions were conducted over the course of two weeks. The sessions were held in a computer laboratory room at the university. Each participant had a personal computer and a monitor. There were two on-line printers at the back of the room. In both the behavior modeling and video tutorial sessions there was a television set and a video-cassette recorder in the front of the room.

All three methods had five segments. (1) Introduction (2) Moving around the worksheet (3) Printing and saving a spreadsheet (4) Formatting a spreadsheet (5) Performing calculations on a spreadsheet. The content of the three sessions was identical; only the format was different.

In the interactive tutorial session, the tutorial was already loaded on the hard drive of each computer. The participants followed the step-by-step procedure demonstrated on the screen. Participants completed exercises that required them to perform several functions. Immediate feedback was given on each exercise. Incorrect responses were noted quickly by the tutorial program, and for the participant to proceed errors had to be corrected. The program was structured so that the participants
proceeded at their own rate. There was a time allotted to each lesson that was comparable to the modeling condition time allocation.

In the videotape tutorial session participants observed a videotape showing a model demonstrating the use of the program. The model sat at his computer, performed a particular exercise and the outcome was shown on his monitor. Participants sat at their computer areas, but were instructed not to perform any exercises on their computer. During the videotape presentation the computer terminals were turned off to prevent a participant from any computer activity.

In the behavior modeling session participants watched a videotape showing a model demonstrating the use of the spreadsheet program. But this time after watching the model perform an exercise, the tape was stopped and the participants did exactly what the model had just demonstrated. As in the interactive tutorial session errors were quickly obvious. The procedures were sequenced identically for all three conditions.

The performance of the participants in all three methods were measured objectively by a post-training examination. All participants were asked to perform specific tasks (e.g. type the label "Principal" in cell B1 right aligned). The examination was printed, collected by
the experimenter and scored for accuracy. The performance test utilized for this study is in Appendix A

Results

Sample
Participants were 50 women and 15 men at a Southwestern university. The mean age was 29 with a standard deviation of 7.65.

Measurement

Experience scale. An 11 item questionnaire was completed by the participants to determine their previous computer experience. Participants were asked if they possessed a computer, how much software knowledge they possessed, and any computer languages they were familiar with. Prior computer experience was measured and the mean level was 4.78 with a standard deviation of .23; a possible high score was 11. Unfortunately, the internal consistency was low with an alpha coefficient of .52. The computer experience questionnaire used for this study is in Appendix B.

Anxiety Scale. An anxiety scale was utilized before the training session. This 26 item, 6-point Likert scale survey assessed the anxiety level of each participant prior to training. The mean was 56.67 with a standard deviation of 1.97. The internal reliability was found to be high
with an alpha coefficient of .91.

**Self-efficacy scales.** Several measures were used and developed for this study. The software self-efficacy scales focused on the self-reported assessment of ability and amount of confidence on part of the participant to issue commands, construct formulas, follow models and save worksheets specific to the software package. Each purported to measure one's own ability to perform a certain task and the participant's confidence in performing this task using a 10-point confidence scale. Scores for these scales were calculated by multiplying the participant's response on whether or not he could perform a certain task scored 0 or 1 by the degree of confidence indicated on a scale of 1 to 10. This procedure was utilized for the purpose of ascertaining an accurate assessment of the participant's perceptions of ability to perform tasks specific to the training program. Internal consistency was found to be high with a coefficient of .93.

**Performance Test.** An objective post-performance test was completed by the participants after the training session to assess their ability to perform specific tasks. Using a parallel model to assess reliability, the alpha coefficient was .91.

**Hypothesis 1.** The first hypothesis predicted that
post-training performance scores would be higher in the behavior modeling tutorial than in the interactive disk or video tutorial. The means and standard deviations for post-training performance for all sessions are displayed in Table 1. A significant main effect was found for the type of session ($F = 16.69, p < .01$). Higher post-training scores were found for participants in the behavior modeling session than for those in either the interactive or video tutorials. Because an a priori a difference was expected between behavior modeling and the other two sessions a $t$-test was conducted. The $t$-test demonstrated the difference was statistically significant ($t = -4.43, p < .01$). Post-training performance scores for the interactive and video sessions were not significantly different from each other. Therefore, the first hypothesis was supported.

Table 1

Post-training performance means and standard deviations by experimental session

<table>
<thead>
<tr>
<th></th>
<th>Modeling</th>
<th>Interactive</th>
<th>Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.30</td>
<td>15.71</td>
<td>14.00</td>
</tr>
<tr>
<td>SD</td>
<td>3.95</td>
<td>4.17</td>
<td>4.34</td>
</tr>
<tr>
<td>n</td>
<td>24</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Hypothesis 2. The second hypothesis predicted participants who possessed more computer experience would
have higher post-training performance scores. A Pearson correlation was calculated between experience and performance scores. Partial support for this hypothesis was found with a $r$ of $0.26$ ($p < 0.05$). Because experience was correlated with test scores it was entered into an analysis of covariance of the variables tested in Hypothesis 1 to determine if the significant effect for type of training was caused by prior experience. Even with experience entered as a covariate, type of session attended remained a significant effect ($F = 16.69$, $p < 0.01$).

Participants' experience level by session attended is displayed in Appendix C. The second hypothesis was only partially supported. Age was not found to be related to experience or performance.

**Hypothesis 3.** Hypothesis 3 predicted that participants in the behavior modeling session would develop higher self-efficacy than those in the other sessions. A MANOVA was run using the four self-efficacy scale scores as dependent variables and type of session as the independent variable. The multivariate $F$ was $1.24$, non-significant. Participant's self-efficacy means by session are reported in Appendix D. No support was found for the third hypothesis.

**Other results.** A Pearson correlation was calculated between the self-efficacy scores and anxiety. Table 2
displays the $r$ values between the self-efficacy scales with the performance test and anxiety. Some scales did have significant relationships with performance. An $r$ of .24 and .28 was found for the scales of constructing formulas and following models. For all the scales summed the $r$ was .24.

Taken as a whole self-efficacy does have some relationship to anxiety. An $r$ of -.39 was found for the self-efficacy scale for developing formulas. The scale for following models yielded an $r$ of -.31. The $r$ was -.34 for self-efficacy on saving worksheets. Taken as a whole the scales were negatively correlated with anxiety, the $r$ was -.36.

Table 2

Pearson correlations coefficients of self-efficacy scores with performance test and computer anxiety.

<table>
<thead>
<tr>
<th>Self-efficacy scale</th>
<th>Performance test</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issuing commands</td>
<td>.07</td>
<td>-.14</td>
</tr>
<tr>
<td>Construct formulas</td>
<td>.24*</td>
<td>-.39**</td>
</tr>
<tr>
<td>Follow models</td>
<td>.28*</td>
<td>-.31*</td>
</tr>
<tr>
<td>Saving worksheets</td>
<td>.11</td>
<td>-.34**</td>
</tr>
<tr>
<td>All scales (summed)</td>
<td>.24*</td>
<td>-.36**</td>
</tr>
</tbody>
</table>

*p < .05 **p < .01
Discussion

Developing an effective method for teaching computer technology has become of ever increasing interest for practitioners. The present study investigated three different approaches and several key components that have been considered to influence the acquisition of computer skills.

Behavior Modeling

As expected, the behavior modeling session proved to be the superior method when compared to tutorial and video methods. The content of each session was the same but in the behavior modeling participants had the opportunity to duplicate the task they had just witnessed. It has been suggested by Bandura (1986) that people learn best through vicarious learning or vicarious reinforcement. This was also further substantiated by comparing behavior modeling to the video session where participants did indeed watch a model demonstrate, but had no opportunity to imitate the hands on experience. Executing each task apparently enhanced learning.

Even when experience, anxiety and self-efficacy were entered first into a regression equation predicting performance scores behavior modeling was still the superior method (See Appendix E). The behavior modeling session was
the only significant factor in determining post-performance. Behavior modeling previously has proven to be effective in the areas of counseling, sales, and computer skills. The findings of this study provide additional support for the effectiveness of behavior modeling in acquiring computer skills. Though cost was not examined here, it is usually a vital factor to an organization and needs to be considered to generalize these findings. The behavior modeling approach costs more but its effectiveness maybe superior enough to justify the additional costs.

Transferability of acquired skills has been proven to be successful (Byham, Adams, & Kiggins, 1976). However, a possible limitation of these results was that it was not known if participants actually used any of their newly obtained skills in their workplaces. This area is worthy of future research.

Experience

In the pretraining questionnaire participants were asked to assess their previous computer and spreadsheet software experience. The Pearson r was small (.26) for this relationship. Previous experience had little bearing on performance. This finding is not consistent with previous studies. Previous studies examined experience as
it correlated with job performance. This study examined experience as a factor of a specific task performance. Research in the area of computer experience and it's relationship to performance has not been examined in detail. There are other reasons why this phenomena could have occurred. The questionnaire may not have covered previous computer experience in depth. More questions could have yielded a more detailed account of a participant's experience. However, only subjects with no previous spreadsheet skill specific to the software package were used as subjects. Also, it can be argued that spreadsheet skills may be different in some significant way from other types of experiences. The tutorial content in all three sessions was designed to teach new computer skills. Participants regardless of previous computer experience could follow the directions and complete the exercises. A general knowledge of computers or software did not enhance post-training performance. The tasks on the post-test that were completed were exactly the same tasks that were completed in the sessions. If a participant remembered the keystrokes he could perform better. Repetition of task and memory seem to be important factors of training and computer skills. A cognitive ability test could have been helpful in assessing a participant's experience. Further research is warranted to
investigate if cognitive ability or short term memory are important factors in behavioral modeling.

Previous computer experience could have been overestimated or underestimated. It was possible that an individual could have experience with spreadsheet software, but not have been truthful on the pre-questionnaire. The full extent of experience was not determined by the questionnaire. An individual with one year of experience and another with 10 years of experience could both answer affirmatively in regards to software experience. A scale of degree of experience in the format of years may have yielded a more accurate assessment. A computer literacy test could be used to gain another assessment of a participant's background. This test could enable the participant to disclose more about his experience and knowledge of computers in general. The logic behind this is to develop some instrument to measure the experience level that one has indicated on the questionnaire. Deception on the part of the participant, intentional or not, is always a concern when utilizing self-report data. Gist (1989) suggested that interviews should be considered. To control for this potential problem it may be possible to interview the participant and assess his or her experience level by certain questions pertaining to computers or
software. Although commensensical, the validity of such a process could be suspect.

**Self-efficacy**

Participants did not develop higher self-efficacy scores in the behavior modeling session as predicted. This finding is not consistent with Gist (1989). It appears that regardless of watching a model, or completing exercises, participants believed that their own capabilities were enhanced to perform certain tasks. Identifying with the method was crucial to developing confidence to perform. This study, however, measured software self-efficacy as a post-measure, as opposed to Gist (1989), where it was used mid-session. Perhaps, participants felt more confident after completing the training session than mid-way through training where they knew they still had to continue through the training. Or, perhaps people felt more confident knowing that the training session was over.

There may be other individual differences that account for this phenomena. Participants could have identified with the training approach and found it simplistic in nature. Working styles were not measured in this study and could have been important. Some people work better alone and at a self-paced course, while others need constant
verbal feedback. It is conceivable that an individual who needs constant verbal feedback could feel helpless in the interactive tutorial where the feedback is on the screen. Although it is impossible to control for this phenomena and was probably equally dispersed across the three sessions due to random sampling, self-efficacy measures might collaborate with such measures.

Furthermore, the training approaches provided demonstrations of a few basic functions, keystrokes, and formulas. This basic approach may have undermined the complexity of spreadsheet software to the point of participant overconfidence. Investigating individual self-efficacy is a difficult task. A subjective rating of one's own abilities can be easily inflated. Although there is no other obvious way to obtain a self-efficacy rating, future research could examine the influence of other measures such as self-esteem, computer literacy, or cognitive ability in conjunction with self-efficacy.

Summary

Behavior modeling does have potential in computer training. Modeling training yielded higher performance. Although experience did not influence performance, it may be an encouragement to trainers. Individuals bring to training different backgrounds and holding that variable
constant should be an important factor to consider when developing a training program.

Currently, computer technology is vital to many organizations' success. Training the workforce effectively to use computers is an important hurdle for trainers to overcome. Although the expense of behavior modeling is important, benefits will be greater in a more computer literate organization. This research offers advantages of using behavior modeling. There remains a challenge to examine the components that influence this training method as well as individual differences among participants.
APPENDIX A

1. Place the coded number on your questionnaire sheet in cell A1. Remember to tell Lotus that it is a label.
2. Type the label 'Principal' in cell B1 right aligned.
3. Right align 'Rate' in the same column under 'Principal'.
4. 'Years' should be added to the same column, also right-aligned.
5. Enter 'Payment' in the same column, also right-aligned.
6. The principal is 10000. Enter.
7. The rate is .10.
8. The loan is for 3 years.
9. Type @PMT(C1,C2/12,C3*12) in cell C4.
10. Change the column-width in column C ONLY to 11 spaces.
11. Type (Right-Aligned) 'Years' in cell A6, 'Begin' in cell B6, 'End' in cell C6, 'Total' in D6, 'Interest' in E6.
12. Enter the three years in their appropriate column.
13. Enter the first year's beginning balance in the appropriate cell by 'brining down' the principal entry. (Use the +)
14. Type @PV($C$4,$C$2/12,12*($C$3-A7)) in cell C7.
15. The annual total paid is 12 times the monthly payment.
16. Interest = Total - (Begin - End). Calculate the first year's interest paid.
17. Change the entire worksheet's numeric format display to Fixed, 2.
18. Lotus has calculated 'Principal', but displays it in an incorrect format. Show it as currency.
19. The 'Rate' suffers from the same problem. Change it to percentage format with 1 decimal place.
20. All the years should be changed to whole numbers. Don't forget the column of years.
21. Copy the cell C7 to cell B8 then to B9.(Use the +)
22. Copy the first year's 'End' to the 2nd and 3rd years.
23. Make the first year's 'Total' entry an absolute address.
24. Copy the corrected formula in cell D7 to D8 and D9.
25. Copy the Interest formula in cell E7 to E8 and E9.
APPENDIX A (Continued)

26. Push the Print Screen (PrtSc) button to print your work on the printer.
27. Notify experimenter that you have finished.
APPENDIX B

While the results of this study are strictly confidential, your willingness to provide me with some information about yourself will enable me to do a better job of understanding how people learn computer software tasks.

Thank You.

Age _____ Sex M F

Major ____________________

G.P.A. Cumulative ________

Major ________

Circle one

Have you ever worked with a computer before? Y N
Do you have a computer at home? Y N
If so, is it an IBM or IBM compatible? Y N
Have you ever played games on a computer? Y N
Have you ever done word processing on a computer? Y N
Have you ever used Lotus 123 before? Y N
Have you ever used a spreadsheet analysis software package before? Y N
Have you used a computer for data base management? Y N

If you have experience with any of the following computer languages, please place a check in the space provided.

BASIC ______
Scientific languages, like FORTRAN, COBOL, etc. ______
Other (Please identify) ________________________

Note: This scale was scored 1 point for each yes answer and a 0 for no.
APPENDIX C

Median split experience mean levels by session attended.

<table>
<thead>
<tr>
<th>Session</th>
<th>Modeling</th>
<th>Interactive</th>
<th>Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Participants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Experience</td>
<td>11</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>High Experience</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Mean</td>
<td>4.55</td>
<td>3.83</td>
<td>4.40</td>
</tr>
<tr>
<td>SD</td>
<td>1.61</td>
<td>1.86</td>
<td>1.39</td>
</tr>
</tbody>
</table>
APPENDIX D

Self-efficacy scale means and standard deviations by session.

<table>
<thead>
<tr>
<th>Self-efficacy Scales</th>
<th>Session</th>
<th>Scale 1</th>
<th>Scale 2</th>
<th>Scale 3</th>
<th>Scale 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior Modeling</td>
<td>Mean</td>
<td>37.47</td>
<td>40.00</td>
<td>39.28</td>
<td>41.85</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>12.66</td>
<td>10.20</td>
<td>10.47</td>
<td>13.55</td>
</tr>
<tr>
<td>Interactive Tutorial</td>
<td>Mean</td>
<td>40.88</td>
<td>39.83</td>
<td>40.50</td>
<td>43.96</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>9.41</td>
<td>10.13</td>
<td>10.56</td>
<td>10.91</td>
</tr>
<tr>
<td>Video Tutorial</td>
<td>Mean</td>
<td>41.20</td>
<td>37.90</td>
<td>36.45</td>
<td>43.45</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>6.25</td>
<td>9.53</td>
<td>12.73</td>
<td>9.83</td>
</tr>
</tbody>
</table>
Regression of variables experience, session, self-efficacy against performance.

Multiple $R = .59$ \hspace{1cm} $R^2 = .35$

$F = 6.60$, $p < .01$

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Correl</th>
<th>Part. Correl.</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>.36</td>
<td>.27</td>
<td>.09</td>
<td>.75</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-.03</td>
<td>-.23</td>
<td>-.07</td>
<td>-.58</td>
</tr>
<tr>
<td>Session</td>
<td>5.59</td>
<td>.52</td>
<td>.50</td>
<td>4.37*</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.03</td>
<td>.22</td>
<td>.17</td>
<td>1.45</td>
</tr>
</tbody>
</table>

$*p < .01$

Note: Training session was collapsed into two categories, behavior modeling tutorial and interactive/video tutorial.
References


337-343.


