

# How High Can It Fly?

Examining the Evidence on Information Mapping's Method of High Performance Communication

by  
Robert E. Horn

## Chapter 2



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#### Note

If you do not have Chapter 1 or 2, please download it from:  
[http://www.stanford.edu/~rhom/a/topic/stwrng\\_infomap/tocStructrdWriting.html](http://www.stanford.edu/~rhom/a/topic/stwrng_infomap/tocStructrdWriting.html)

# Overview of This Chapter: Abstracts of Research

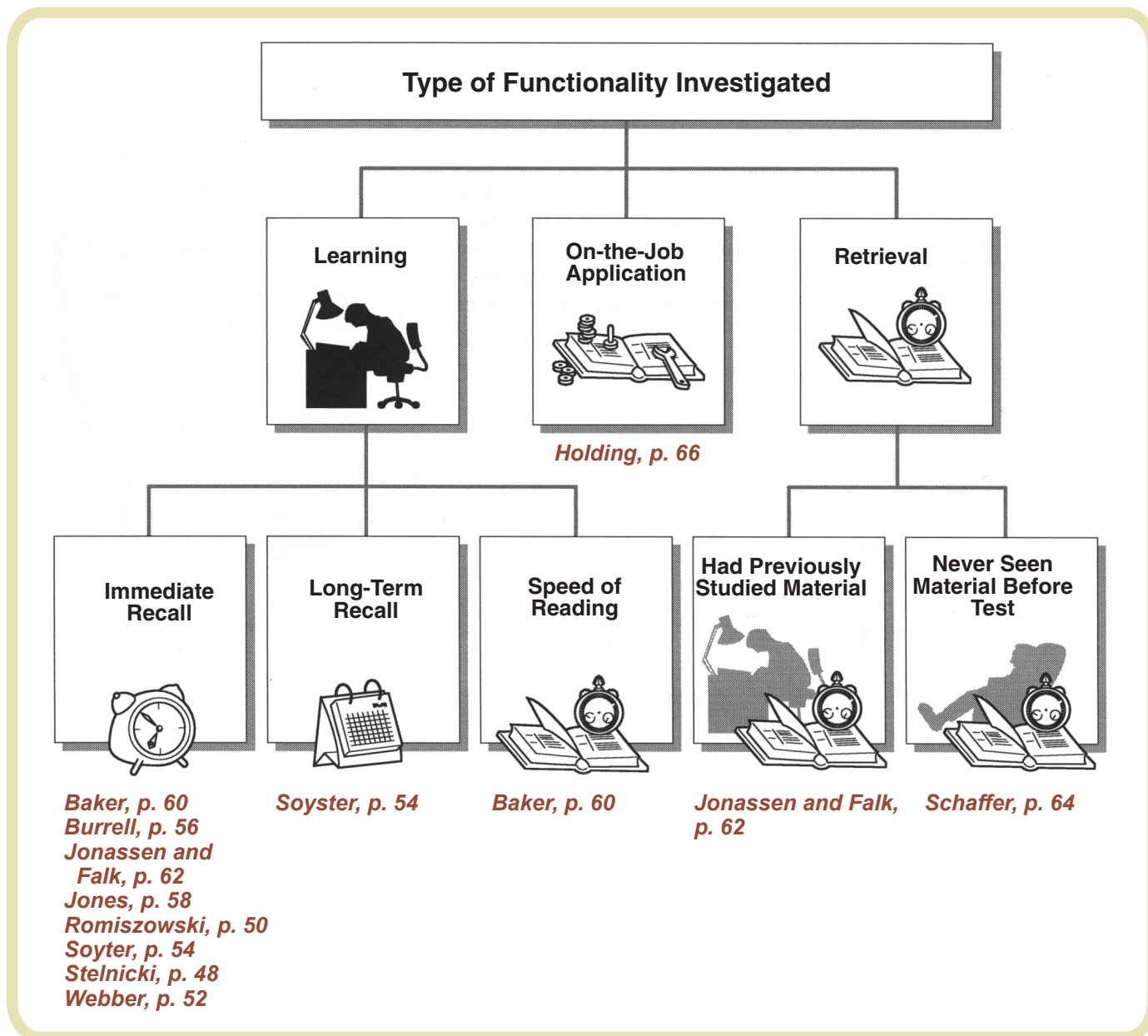
## Introduction

We can evaluate training and retrieval methodologies in a variety of ways. We have surveyed these evaluation approaches in the previous chapter. In this chapter, we present more detailed abstracts of major research and evaluation studies conducted in universities and in business. These studies have covered a wide range of subjects, training and retrieval situations, and learners. The emphasis in this chapter is on presenting results of research done independently of Information Mapping, Inc., but focused on its methodology.

## Charts on These Pages

The next 4 pages present tree-like classifications of the research reports. The research is listed by author and page number along the bottoms of the charts.

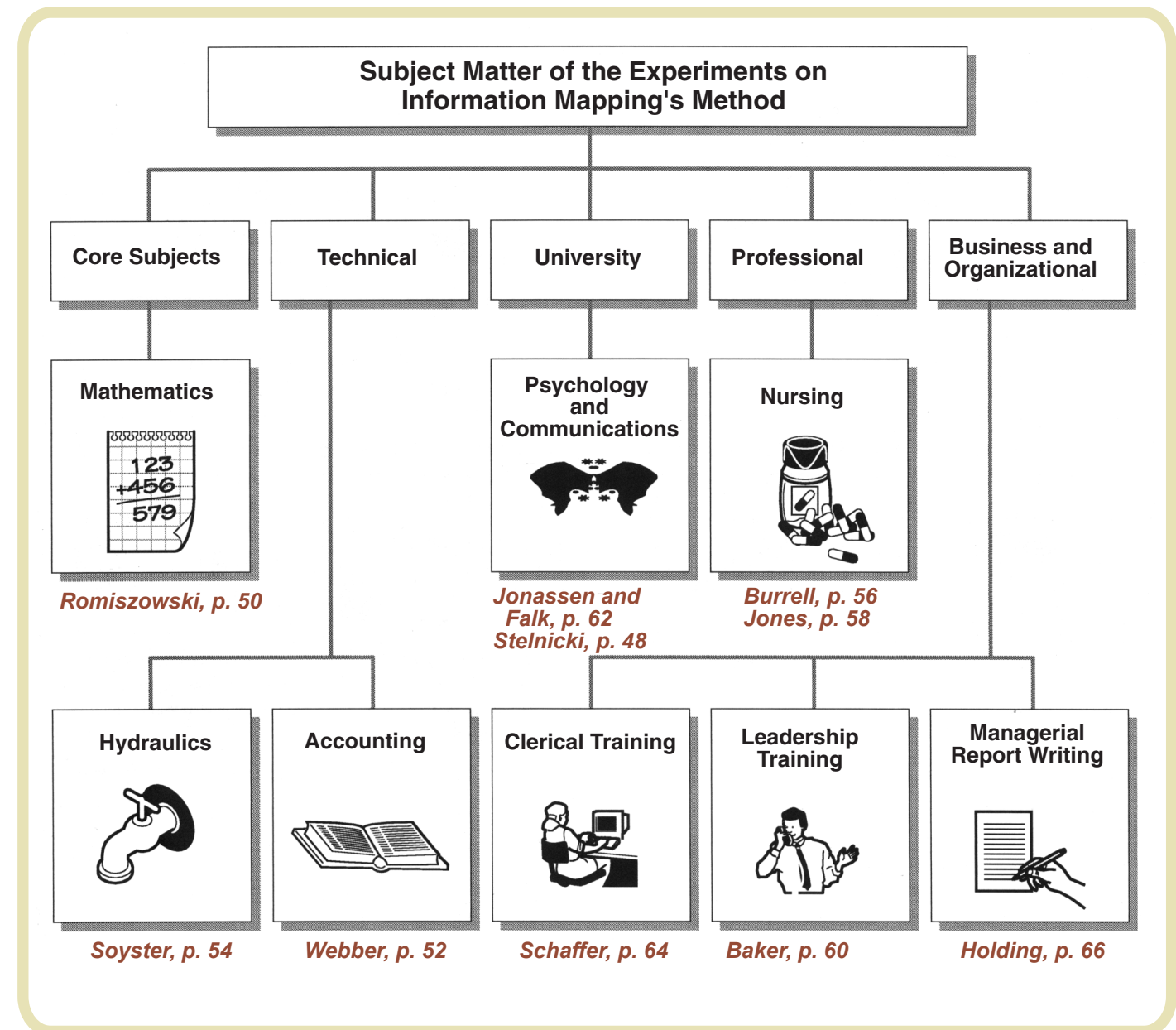
The charts on these 4 pages show the results of the same studies from different points of view. A study is mentioned 2 or more times if its results apply to 2 or more factors (e.g., Soyster measured both immediate recall and long term recall, so he is mentioned twice).



## Questions Answered by the Charts

These charts sort the research according to the various questions the reader might have:

- What was the researcher trying to find out?
- What kinds and levels of subject matter documents were used in the research?
- In what organizational settings was the research done?
- What level of learners or users of the documents participated in the experiments?



## Overview of This Chapter, continued

### Introduction

Continuing the overview of research summarized in this chapter, we look at where the research was conducted, and who the subjects were in these studies.

The research reports are referenced by the name of the investigator along the bottoms of the charts.

Here's the Actual Order of Pages in This Chapter:

### Research Primarily Concerned with Learning

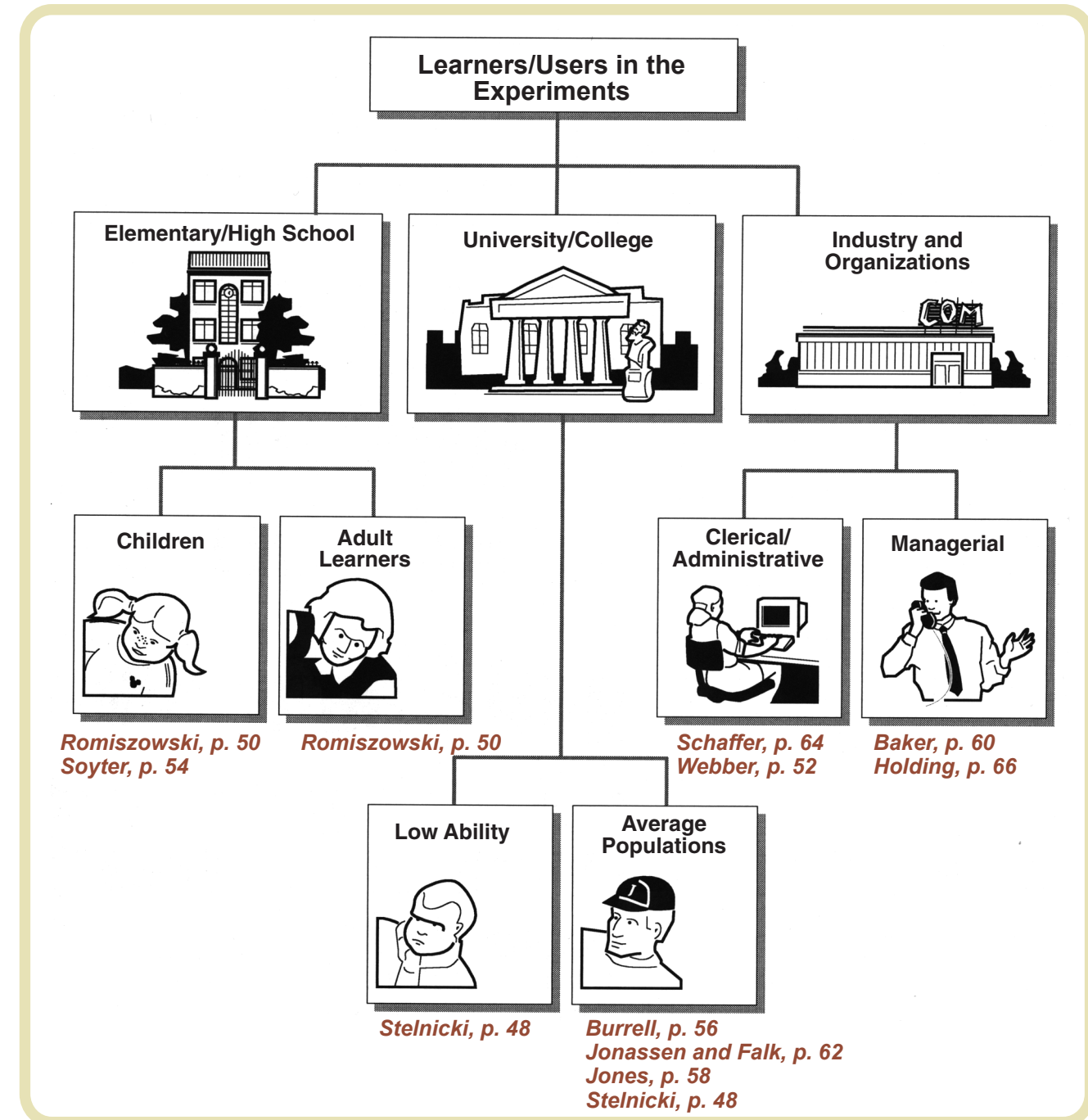
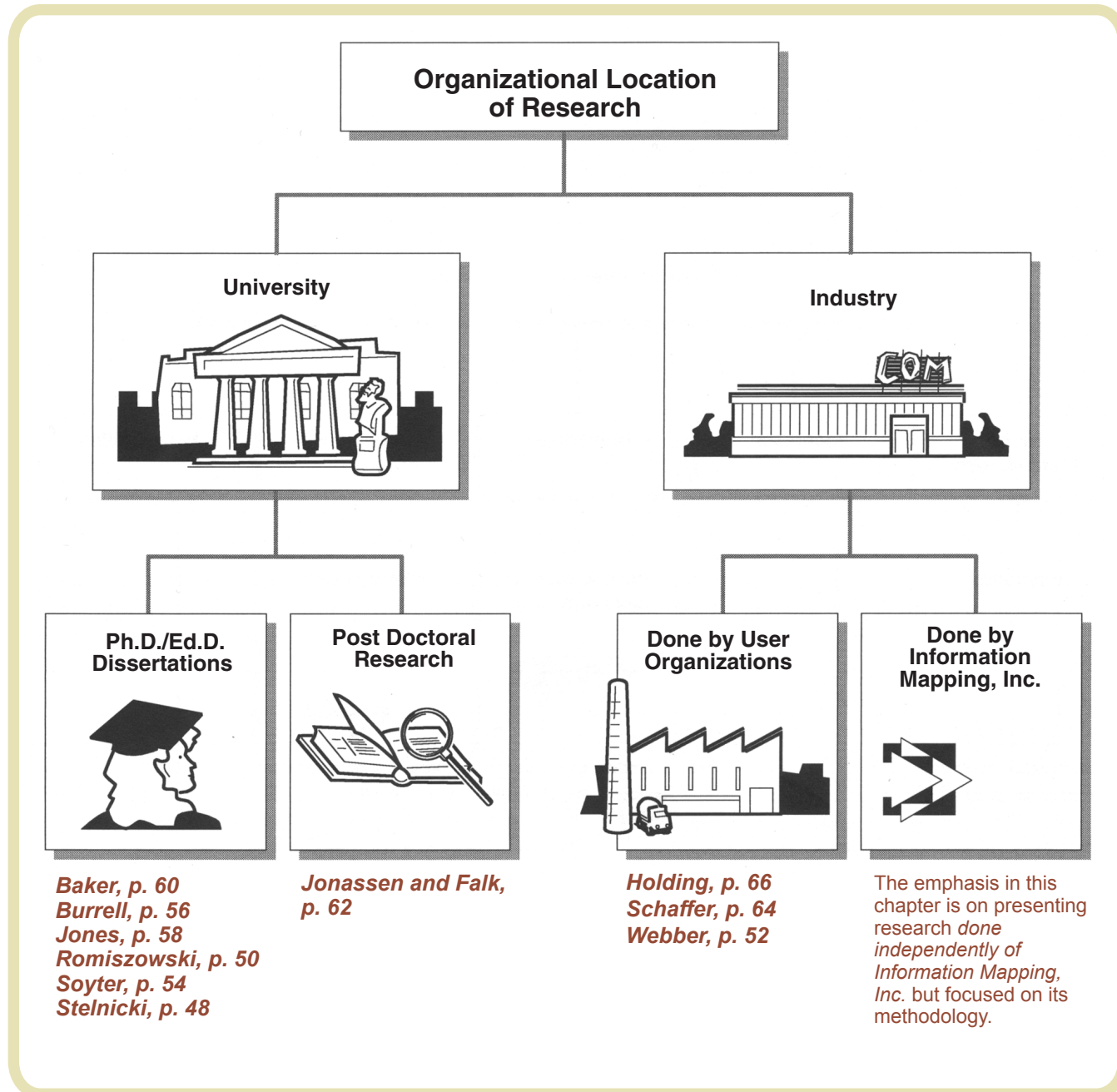
Stelnicki: Both Facts and Abstract Concepts Learned More Efficiently, 48 □  
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# Stelnicki: Both Facts and Abstract Concepts Learned More Efficiently

## Problem

Can college students learn both facts and abstract concepts more effectively and efficiently using material prepared with Information Mapping's structured method than they can with material in normal prose?

## Materials Used

The materials were designed to teach facts and concepts about Piaget's four states of cognitive development.

## Task

The administration of 2 tests, one on fact learning and one on concept learning, specifically tied to the learning materials the students studied.

## Method of Presenting Task

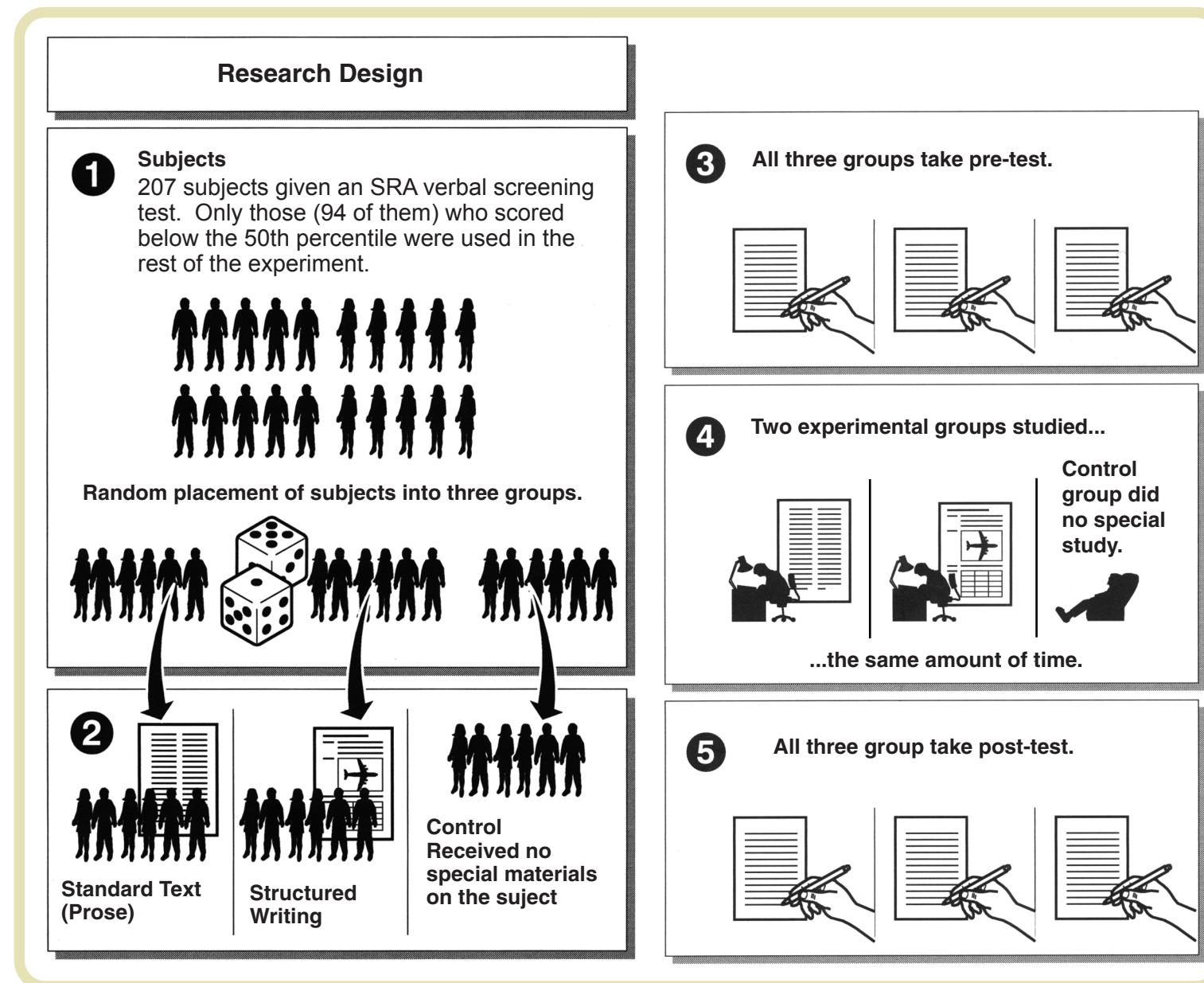
The 94 subjects were randomly divided into 3 groups:

- those who received standard texts,
- those who received structured writing, and
- those who were control subjects

## Subjects

There were 94 subjects at three public midwestern universities participating in the research. They were:

- 81% were female, and
- 19% were male.



## The subjects

- scored at or below the 50th percentile on the SRA Verbal Form
- ranged in age from 18.3 years to 52.3 years, and
- had a mean age of 19.8 years

The subjects were in a "low general ability category" by the SRA measure.

## Results

Material prepared according to Information Mapping's method produces higher gain scores than the standard text.

## Magnitude:

For the retention of facts, Information Mapping's method was better by 32%.

For the retention of concepts, Information Mapping's approach was better by 41%.

**Significance:** Yes.

## Conclusions

Stelnicki's research shows that structured writing containing facts produces higher gain scores than standard text. This implies that concepts generate higher gain scores than all other combinations of methods, and that structured writing is a superior method when used for teaching concepts.

## Author and Affiliation

Michael Stelnicki, Northern Illinois University.

## Citation

**The Effects of Information-Mapped and Standard Text Presentations with Fact and Concept Levels of Learning on Low General Ability Adult Learner Cognition.** Unpublished Ed.D. dissertation, May 1980.

# Romiszowski: Both Children and Adults Learn Mathematics Better in Less Time

## Problem

The question asked was: Which is the better method of preparing instructional materials in mathematics for children and adults-traditional linear programmed instruction, or structured writing prepared with Information Mapping's method?

## Materials Used

Two sets of booklets were prepared having:

- similar content (the content was as close to identical as possible in both)
- identical sequence
- the same examples
- nearly the same number of words.

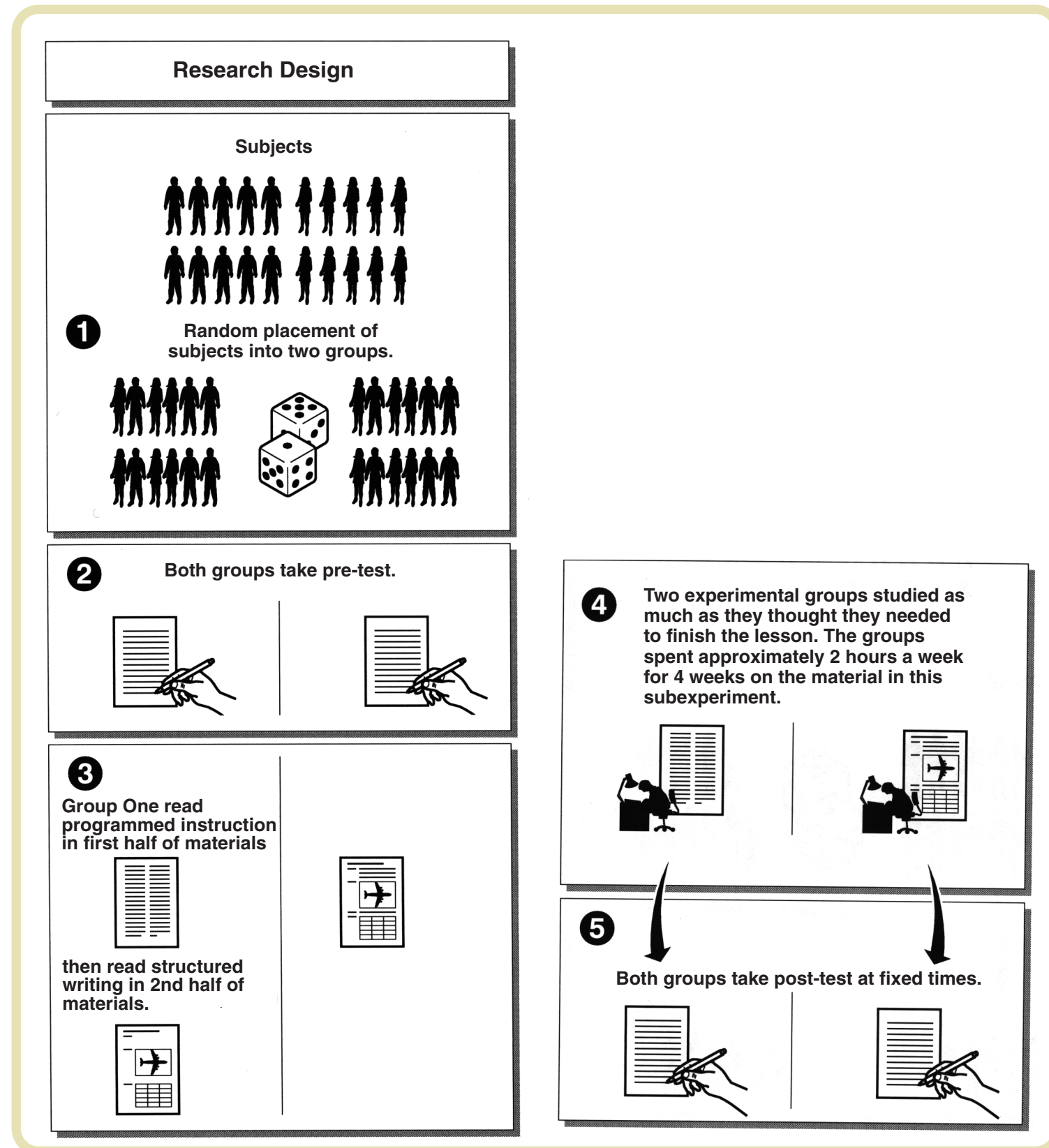
The Information Mapping version had approximately 16 maps and approximately 22 pages of feedback and practice exercises.

The programmed instruction version had approximately 25 frames "not typically Skinnerian, but rather more challenging in terms of the amount of information the frame might present." It was a "typical demonstration/practice test sequence of linear frames."

## Task

A test on mathematical problem-solving of about 40 questions was used for the subexperiment. The exam tested "medium length [to] long term retention." The exams were standard tests that had been developed for the Brazilian state school system.

The experimental material was on the topic of factorization, and appeared within the context of a larger course. The investigator prepared 2 sets of instructional booklets to use during part of the course- one set in traditional, programmed instruction, and one set in Information mapping's method.



## Subjects

A total of 160 children and adults in Brazil were subjects of the subexperiment:

- 15-16 year old advanced secondary students who had not studied mathematics for at least six months, and
- 20-30 year old adults who were attempting to complete high school.

Note: Some of the adults had been away from school for five to ten years.

## Results

**Magnitude:** Both adult learners and schoolchildren learned significantly more from instructional materials written according to standards of the Information Mapping writing service and spent approximately 10% less time than students who used a programmed instruction version.

The adults, on the whole, had 11.3 percent higher scores, and the children had an average of 6.6 percent higher scores.

**Significance:** Yes.

## Conclusion

"The results of this experiment (which was conceived as four subexperiments, each of cross-over design-2 by 2 square) were in all four cases apparently strongly in favor of the Information Mapping format, in terms of both reduced learning time and increased final test score."

## Other Findings

The students performed consistently and significantly better on the parts of the test for which they used structured materials in both groups.

Students who used structured materials not only performed better on the test, but they also needed less preparation time.

## Author and Affiliation

Alexander Joseph Romiszowski, Ph.D., Loughborough University of Technology (U.K.), now at Syracuse University.

## Citation

*A Study of Individualized Systems for Mathematics Instruction at the Post Secondary Levels.* Ph.D. dissertation, 1977, Loughborough University of Technology (U.K.).



# Webber: Improves Initial Learning and Reduces Training Time by Structured Writing

## Problem

Is the Information Mapping method of preparing training material better than the conventional methods?

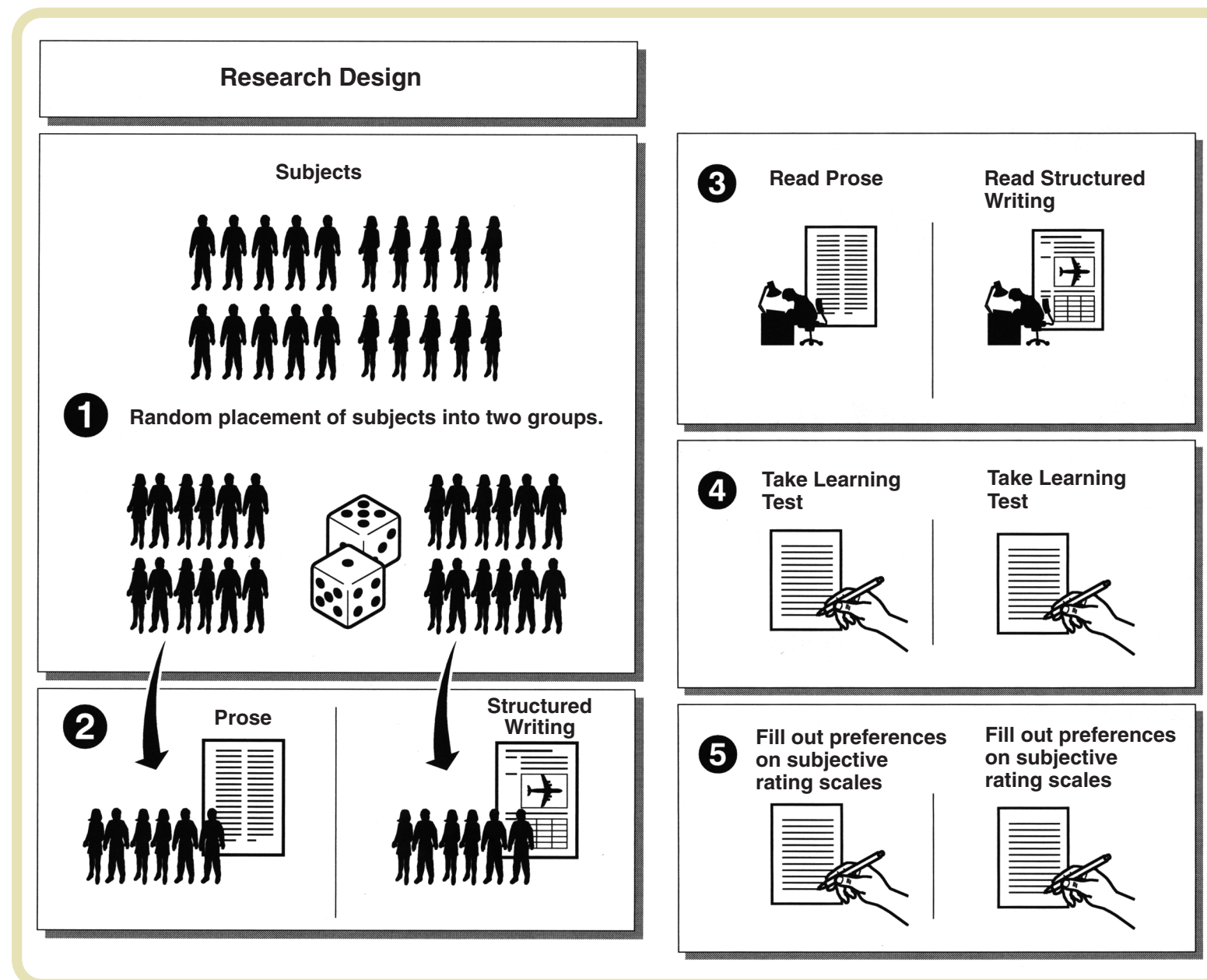
## Materials Used

A set of standard training materials and a set of materials prepared using Information Mapping's method.

## Task

Functional Accounting Coding Tasks.

Subjects Administrative and clerical employees of Pacific Bell. (No further information in the report.)



## Results

Magnitude:

Factors	Treatment	Information Mapping	Standard Mapping
Lesson Test: Average Scores		95%	75%
Criterion Test: Average Scores		91%	53%
Percentage of learners achieving 88% or above accuracy in			
• Lesson Tests		95%	30%
• Criterion Tests		83%	0%
Course Length		1 day	1 day

Significance: No test reported.

## Conclusions

**Initial Learning:** Learners using instructional material written using Information Mapping's method scored 38% better on criterion tests as compared with a similar group using standard training material containing text and questions.

**Training Time:** Learners using the Information Mapping version took an average of 1 day in self-paced learning mode as compared with 2 days for the learners using standard training—a 50% improvement in training time.

**Attitude:** Eighty percent of the MAP learners felt the training was "fairly easy to easy" as compared with 60% of the learners with standard training.

Ninety-five percent of MAP learners felt "fairly well to well prepared and confident" at the end of training as compared with 44% of the learners using the standard training materials.

## Other Findings

"The performance level back on the job has been very good. We've seen them start out on the job making 85% accuracy to start out with, and within the month they're moving up into the 90s in on-the-job performance."

## Author and Affiliation

Naomi Webber, Pacific Bell.

## Title

*Some Results of Using the Information Mapping Writing Service Standards at Pacific Telephone Company*, paper given at national conference of the National Society for Performance and Instruction,

# Soyster: Better Achievement in Instruction Research Design

## Problem

Does Information Mapping's method of structured writing and instructional design produce better learning and retention than a standard method of training?

## Materials Used

Two versions of an instructional course on hydraulics: one using Information Mapping's method, the other using a standard method of self-instructional training delivery resembling programmed instruction.

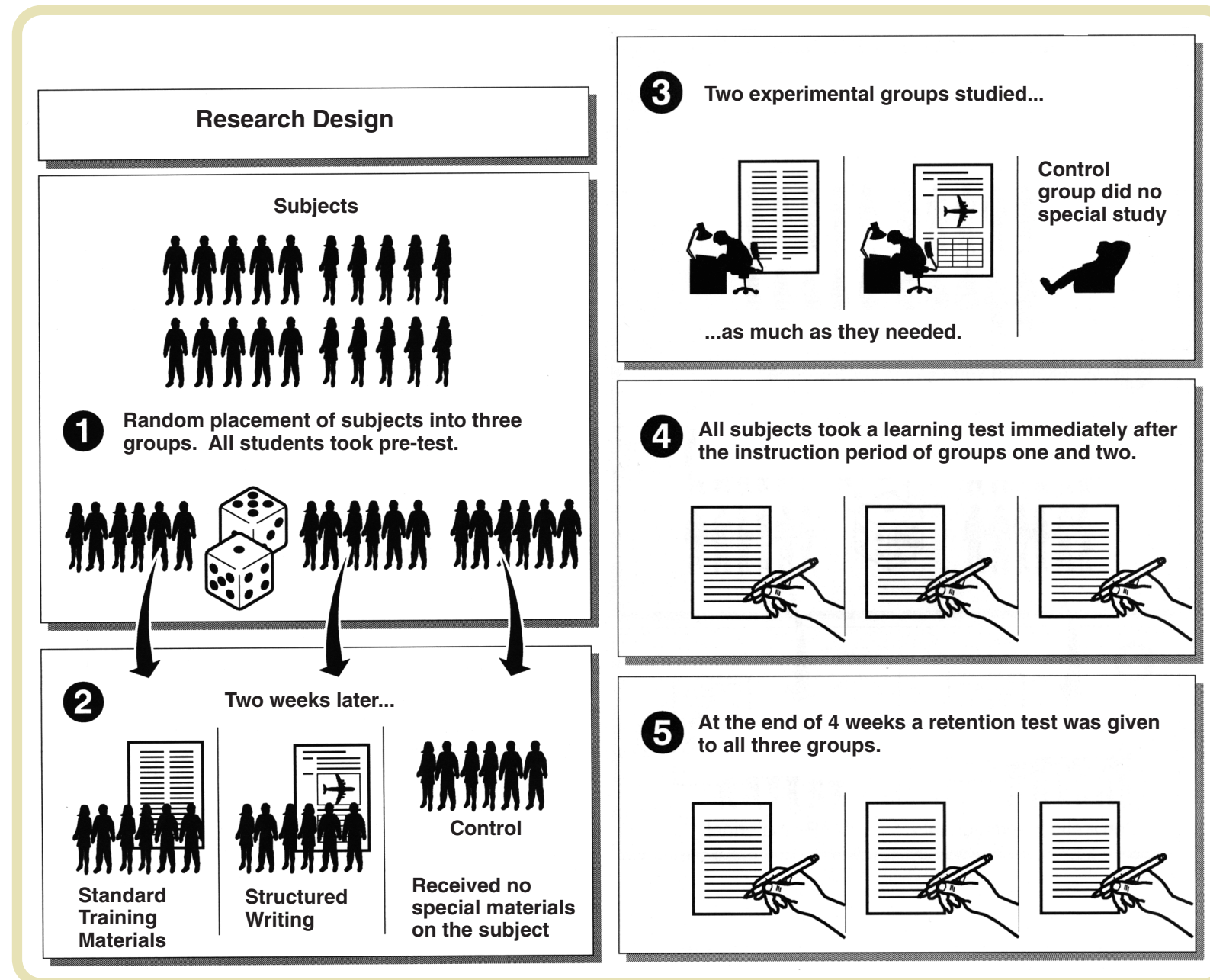
## Task

Two tests were given, one testing initial learning and one testing 4-week retention

## Subjects

367 ninth-grade students (194 males and 173 females).

*Initial Screening:* Any potential subject who scored 50% or more on a screening test on hydraulics was eliminated.



## Results

*Magnitude:* The group using Information Mapping's method performed 13% better than the the group using the programmed instruction in the test scores.

*Significance:* Yes.

## Other Findings

Neither auto-instructional method produced significantly higher achievement on learning or retention when considering only high or only low mental ability subjects.

Consequently, there does not appear to be an aptitude- treatment interaction between either method and high or low mental ability.

## Conclusions

The investigation yielded these findings: Students who received instruction had significantly higher mean achievement scores than the control group when tested immediately. Students who used Information Mapping's structured writing scored significantly higher than students who used the standard training method materials when tested immediately. There was no significant difference between the students using either method when retention was tested 4 weeks after instruction. The researcher attributed this to poor motivation on the part of the learners.

Programmed instruction is effective, but texts written in structured writing produce significantly higher achievement in initial learning tests.

## Author and Affiliation

Thomas J. Soyster, Ed.D., Temple University.

## Citation

*A Comparison of the Effects of Programmed Instruction and the Information Mapping Method of Instructional Design on Learning and Retention of Students of Different Mental Abilities.* Ed.D. dissertation, 1980.



# Burrell: Significantly Greater Achievement in Critical Care

## Problem

How well do students learn from material prepared according to Information Mapping's method compared with regular prose treatment in a self-assessment framework?

## Materials Used

Critical Care Course: Nursing Roles in Crisis.

- anatomy and physiology
- synthesis of previous nursing information
- predominantly new information.

Text used: Z. L. Burrell, Jr. and L. O. Burrell, *Critical Care*, 3rd ed. St. Louis: C.V. Mosby Co., 1977.

The students used self-assessment guides written according to Information Mapping's method for one chapter of each of the 3 sets of paired chapters. They studied the other chapters without additional written instructional material.

## Task

Administration of a 60-item posttest on the chapters studied.

## Subjects

39 senior students at the Medical College of Georgia School of Nursing at Athens.

## Results

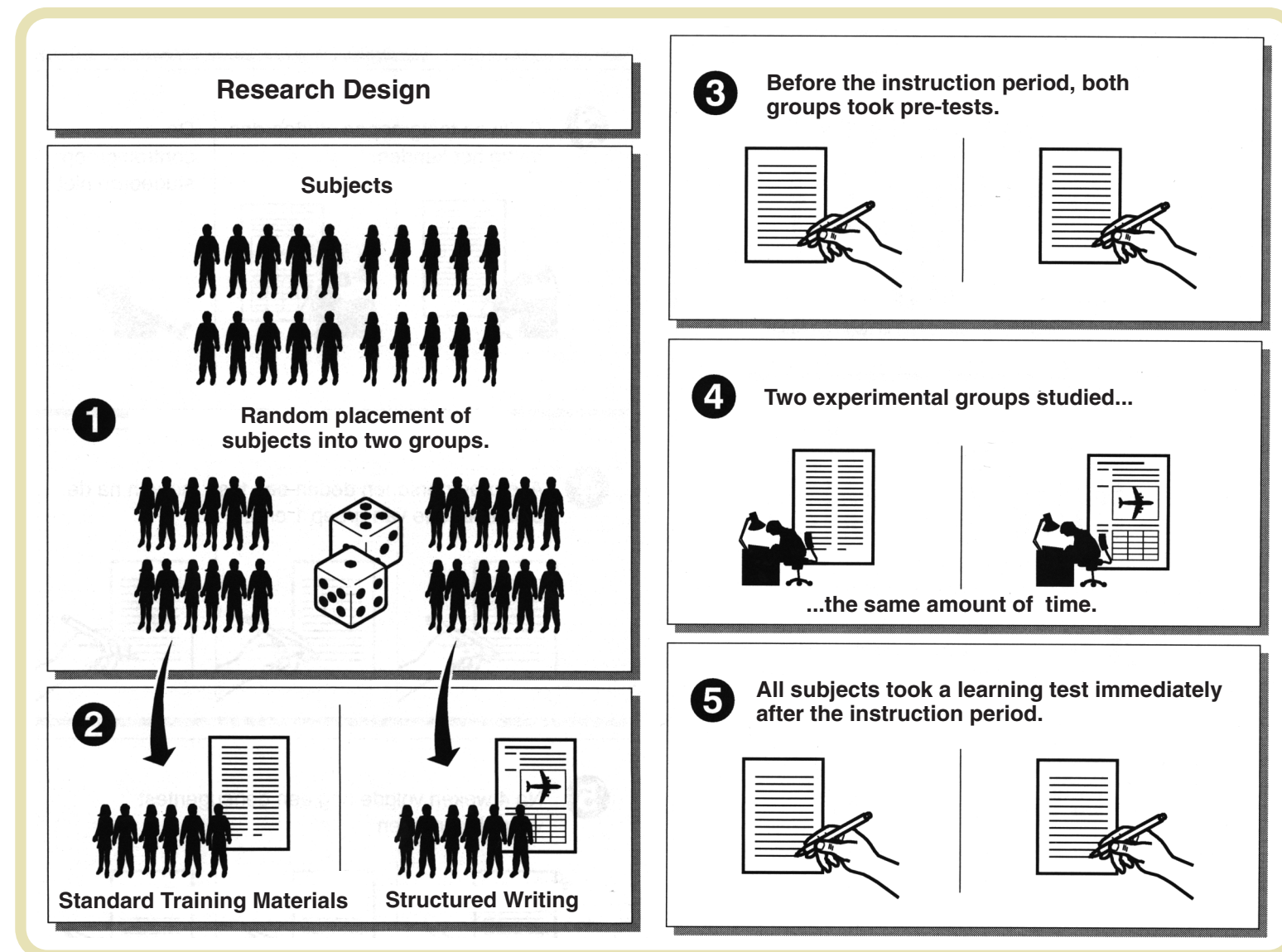
*Magnitude:*

The "students missed over twice as many questions without the guides when compared to the tests with the guides."

For high SAT score students, the Information Mapping version produced average scores 59% higher than the standard version.

For lower SAT score students, the Information Mapping version produced average scores 53% higher than the standard version.

*Significance:* Yes.



## Conclusions

Students whose scores were above or below the national SAT mean scores using instructional material written according to the standards of the Information Mapping writing service showed significantly greater overall achievement than learners who did not use the instructional material.

## Author and Affiliation

□ Lenette O. Burrell, R.N., Ed.D., Medical College of Georgia □ School of Nursing

## Citation

Dissertation Abstracts International 1979, 39(12): 71110 A..□

# Jones: Students Achieve Greater Mastery

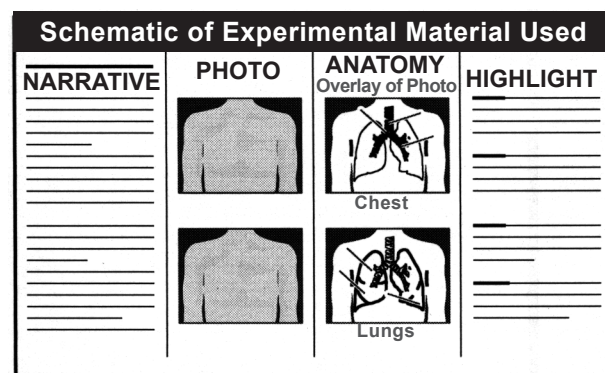
## Problem

This study asked: (1) Does using Information Mapping's approach increase learning scores, preference ratings, and decrease study time compared with a traditional textbook? (2) Can one distinguish levels of anxiety prior to testing between groups using different versions of learning material?

## Materials Used

The traditional textbook used in this course was a "well established third edition" of the Health Assessment Manual (McGraw Hill, 1986) written by the researcher. The prepublication edition of this material was used to keep the author's name anonymous so as not to influence results. A single chapter on doing a physical examination of the thorax and lungs was used in the experiment.

The Information Mapping version was produced in a special 4-column format. "[T]he first column [was] used for verbal presentation. Within this column, concepts and definitions of specific aspects of the examination (e.g., the definition of respiration) were presented; the process (e.g., the function of a particular body part) was discussed; and the related procedures (e.g., the step by step process involved in examining the heart) were explained. Visuals were presented in columns 2 and 3 and specifically designed to interface with the narrative prose and reflected the objectives of the information block under discussion. . . . visual designs were created in relation to the overall model of the text and incorporating multiple cuing strategies. . . . the fourth column was devoted to . . . reviewing. Within this column, verbal and visual information was reviewed from the three preceding columns and highlighted, so as to reinforce both narrative and visual information, thought to be important."



## Task

Three test measures were used:

*Competency Based Assessment Tool (CBAT)* consisting of 50 multiple choice and short answer items. Approximately 50% of these questions contained a graphic element.

*Assessment Textbook Preference Rating Scale (ATPRS)* to determine student preferences for traditional and experimental textbooks treatments.

*State-Trait Anxiety Inventory (STAI)* used to measure level of student anxiety immediately prior to testing of the homework reading assignment.

## Subjects

The subjects were 70 full-time students at three university nursing schools enrolled in their first nursing course. Ages 18 to 31, with a mean age of 20.16 years.

Participation in the experiment was voluntary and did not affect students' grades.

## Results

**Magnitude:** "The results of this investigation further demonstrated that in comparison to the traditional text format, students from all three academic settings who studied from the interactive information mapped text received significantly higher scores on the test of mastery, had significantly higher scores on the text book preference rating scale, and increased their study time."

**Learning:** The group of students who used the Information Mapping version scored approximately 22% higher in the competency test.

**Preference:** The students who used the Information Mapping version gave significantly higher ratings to their material over the ratings provided by the traditional textbook group.

**Anxiety:** There was no significant difference in anxiety immediately preceding the taking of the mastery test. The author attributes this to the fact that the results of the experiment did not influence student grades.

**Learning Time:** "[S]tudents who studied from the mapped text (60 minutes or less) received higher mastery scores than did students studying from the traditional text (for more than 60 minutes). Students who studied the mapped text for more than 60 minutes received higher scores than those studying the mapped format less than 60 minutes. All student studying from the information mapped text, regardless of study time, had significantly higher scores on the tests of mastery."

**Significance:** Yes.

## Conclusions

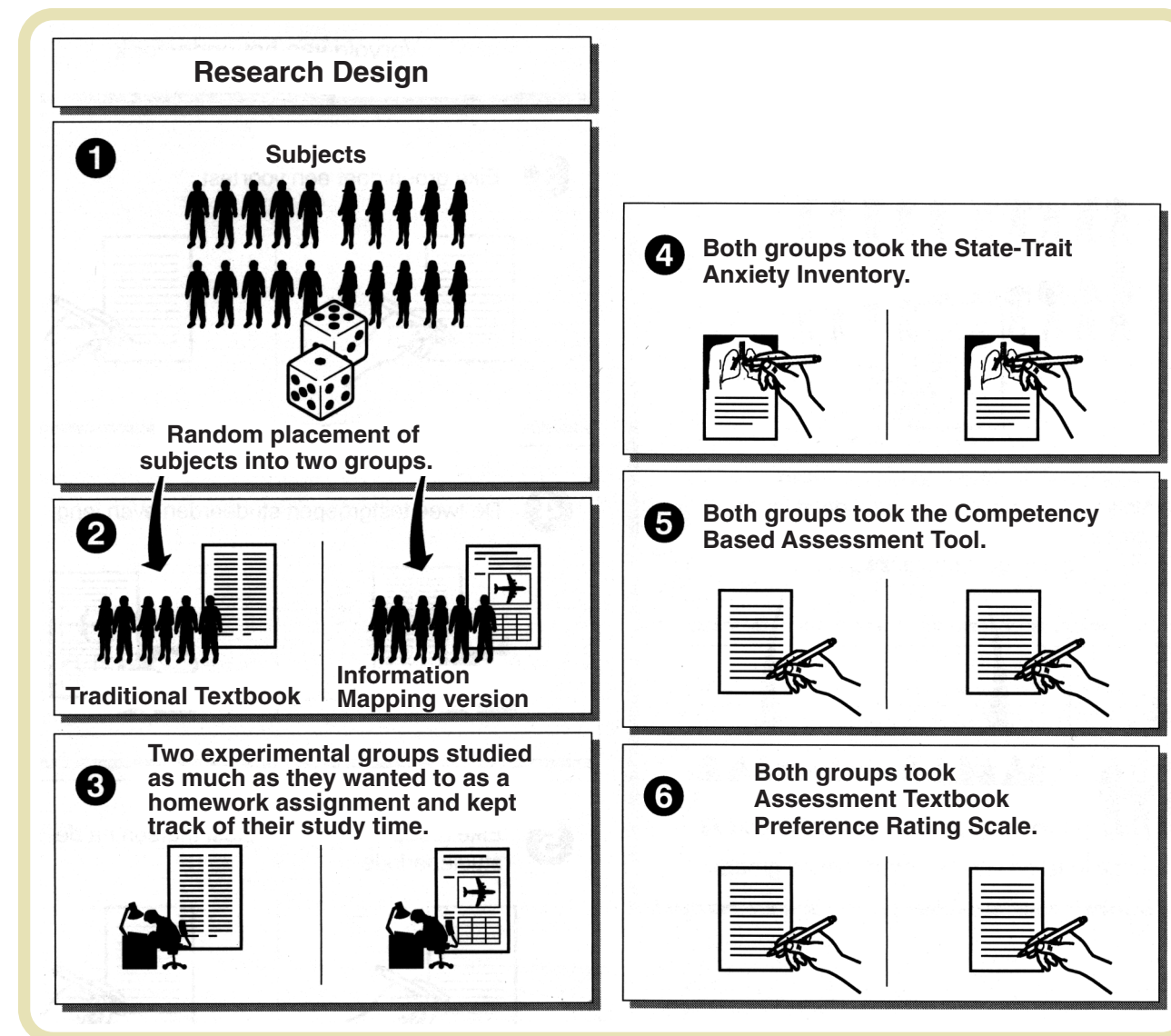
These findings support the hypothesis that materials prepared according to Information Mapping's approach "(1) resulted in significantly higher scores on test of mastery; (2) [were] significantly preferred over other text formats presenting similar content; (3) [were] read longer than the traditional format; and (4) increased study time, which significantly influenced mastery scores. . . . In addition, reactions to the interactive information mapped format tended to be more positive and consistent, had greater depth, and contained more individual reactions to the text format."

## Author and Affiliation

D. A. Jones, Ed.D., R.N., C., F.A.S.N., Boston University, now at Boston College School of Nursing.

## Citation

*The Effects of an Interactive Information Mapped Textbook on Mastery Learning of Physical Examination and State Anxiety of Undergraduate Nursing Students*, Boston University, Ed.D. dissertation, 1986.





# Baker: Effects of Recall and Speed of Reading

## Problem

How does Information Mapping compare with prose and with prose augmented with advanced organizing information in speed of reading and immediate recall?

## Materials Used

There were 3 texts used by the 3 groups in the study:

- *Prose*. A text 24 pages long used to train soldiers in the U. S. Army in leadership. It contained a "liberal application of such aids as the use of major topic headings, the insertion of section summaries, and conclusions, and underlining key words."

- *Prose-with-Advance-Organizer*. This version contained the prose version with an advance organizer treatment at the very front of the text. The advance organizer was approximately one page long.

- *Information Mapping version* which contained the same number of pages as the prose version (24 pages).

## Task

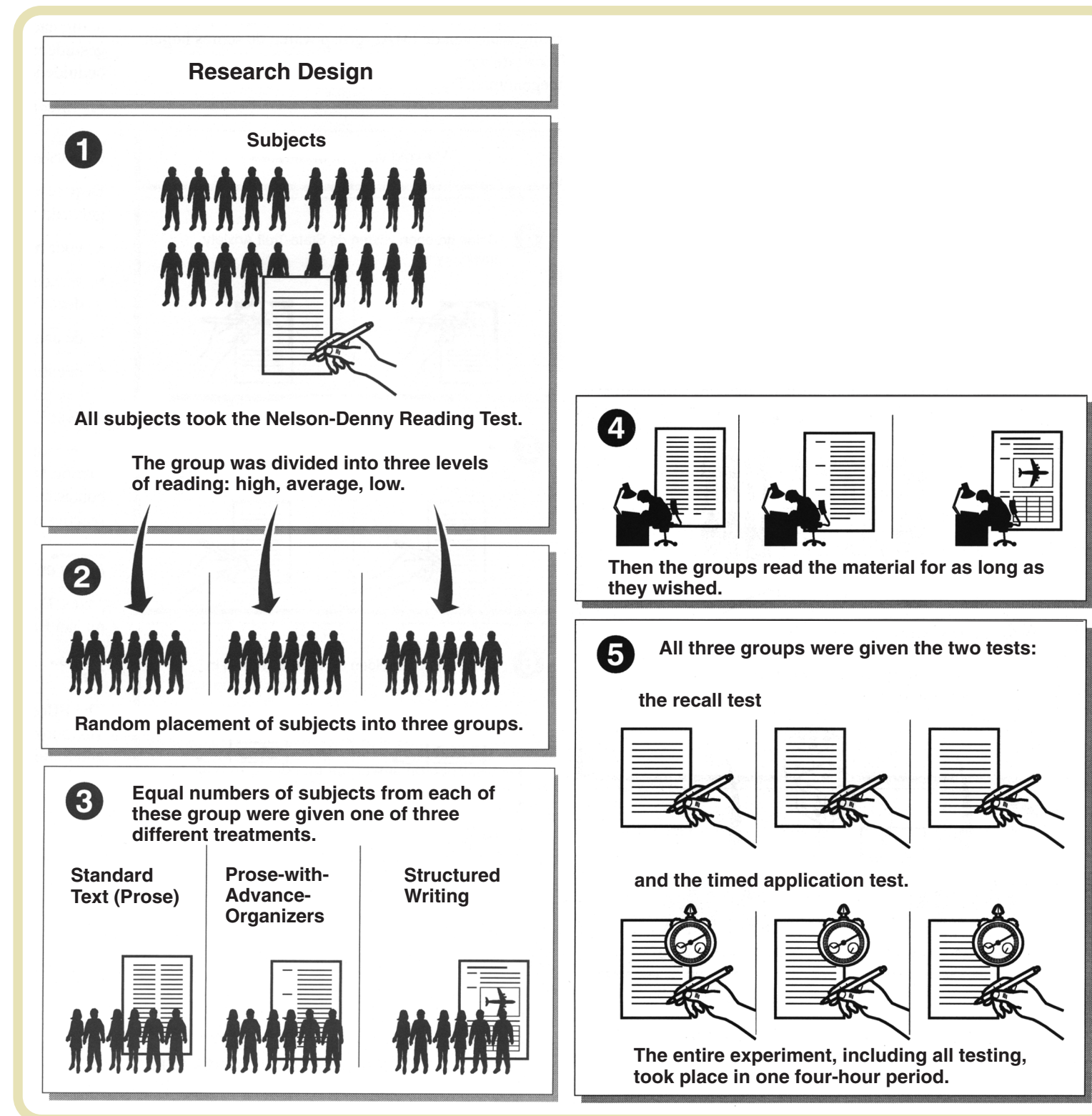
*Reading test*. The subjects were divided into 3 reading ability groups: high, average, and low, based upon the results of the reading comprehension portion of the Nelson-Denny reading test.

*Two post-tests* were administered during the sessions:

- a multiple choice recall examination consisting of 33 questions scored on accuracy
- an application examination containing multiple choice questions scored on the basis of time.

## Subjects

335 junior officers (266 male and 69 female), primarily second lieutenants, attending Signal Officer Basic Course at Fort Gordon. Ninety-five percent of the officers had previously graduated from colleges and universities.



## Results

*Magnitude*: The three groups did not differ significantly on the scores on either of the tests.

The Information Mapping group did, however, have significantly lower reading times. □

1. The Information Mapping group read 12% faster than the advanced organizer or prose group in the high ability reading group.
2. In the average reading level group, the Information Mapping group read 18% faster than the advanced organizer group and 20% faster than the prose group.
3. In the low reading ability level group the Information Mapping version produced 16% faster reading than the advanced organizer group and 21% faster reading than the prose group.

*Significance*: Yes.

## Conclusions

The research showed that subjects who read a text using Information Mapping's method significantly outperformed the subjects who read the prose and prose-with-advanced organizer versions. Subjects in the high reading ability group also significantly outperformed the lower ability readers in reading time, recall scores, and application time.

## Author and Affiliation

Edward Isaac Baker, University of Georgia, Athens.

## Citation

*Effects of Variations in Text Designs and Reading Competency on the Immediate Recall and Application by Army Lieutenants Attending the Signal Officer Basic Course*, Ed.D. dissertation, 1988. □

# Jonassen and Falk: Provides Significantly Better Retrieval

## Problem

Are materials prepared according to Information Mapping's method better than programmed learning materials for retrieval of information?

## Materials Used

Two versions of self-study materials were developed for this experiment from a 2,000-word prose passage, "Communication and the Teaching Process":

**Standard Training Method.** One version was a 20-page programmed learning text containing 40 frames "of a paragraph or less, and multiple choice questions were inserted after each unit with knowledge of results presented immediately below the frame on which the student was working." Two illustrations (apparently diagrams of the communication process) were put at the end.

**Structured Writing Materials.** The version prepared according to Information Mapping's method was a 19-page document which contained 18 information maps, 55 blocks, and the same two illustrations.

Our understanding is that there was active response in both versions.

## Task

**Pretest /Posttest.** (for recall):

- 41 test items
- 4-option multiple choice
- test items extracted verbatim from text
- reviewed for validity by panel of subject matter experts.

Reliability for this exam was established by administering it to a separate group of subjects.

**Retrieval Test.** (for speed and accuracy of lookup):

- open book tasks
- 45 fill-in-the-blank questions using stems from the pretest-posttest exam
- students were required to write the page number on which information was located
- test administered 2 weeks after the posttest.

## Subjects

41 seniors and graduate students in two sections of an introductory media course.

Subjects were divided into two unequal groups:

- 22 used structured writing, and
- 19 used standard writing

## Results

**Magnitude:**

**Retrieval.** Students using the structured writing version of the materials were 32% more accurate than those using the standard training material. Results were measured in terms of "the total number of correct answers that could be located within one hour."

**Initial Learning.** The two methods (standard and structured writing) both provided approximately equal initial learning when presented in a self-paced mode.

**Significance:** Yes.

## Conclusions

The structured writing version provided significantly better retrieval of information than the standard training materials. "The structural characteristics of [the Information Mapping version] provide a clear advantage for retrieving information from textual materials," wrote the authors. "This study has proven that Information Mapping is an effective alternative means for enhancing print-oriented textual materials. The instructional effectiveness of mapping has been documented in a variety of settings, including industrial and business training, the military, in the university, and at technical institutes ...The clearest mandate produced by this study is for the use of information mapping techniques in the construction of reference tools."

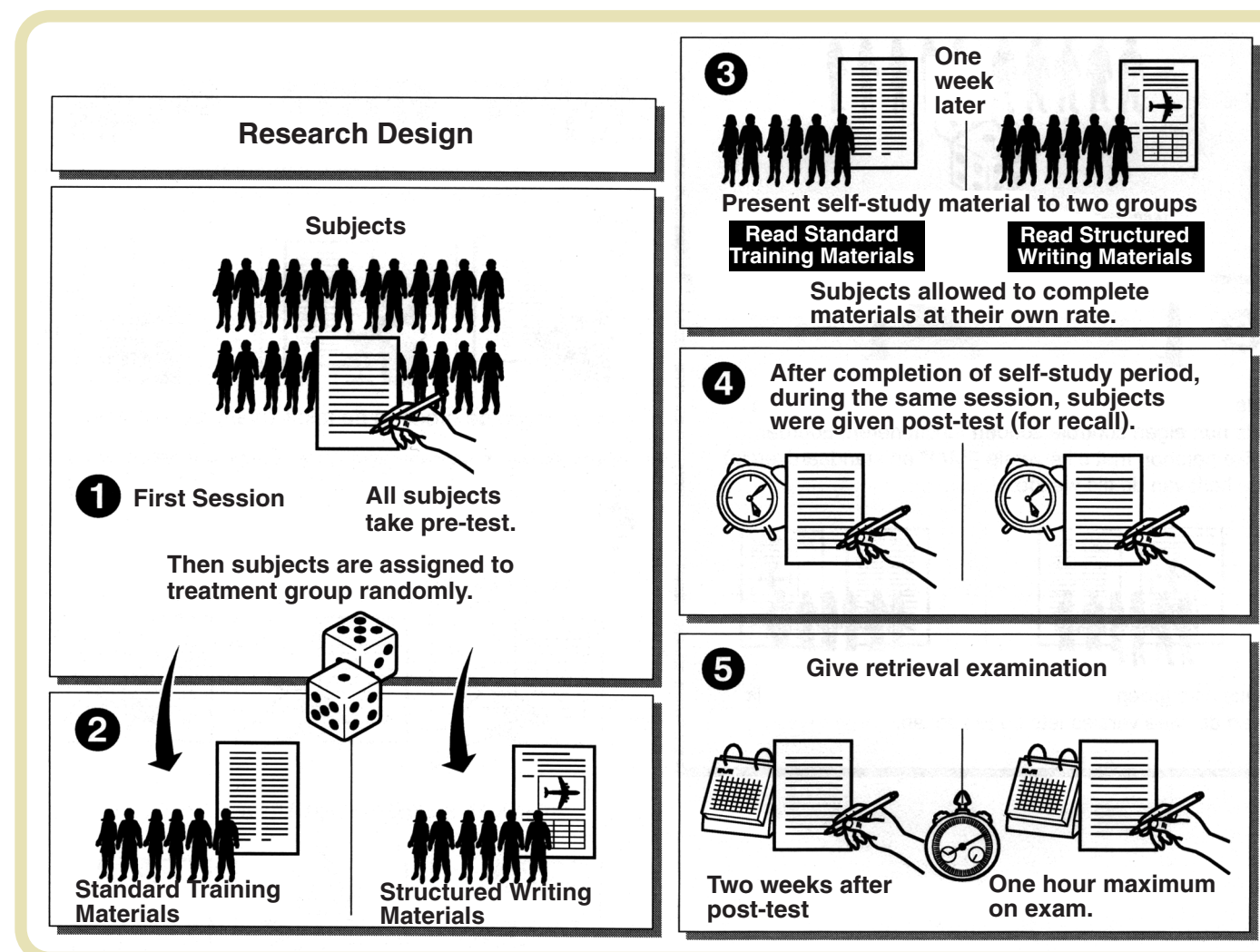
## Author and Affiliation

David H. Jonassen, School of Education, University of North Carolina at Greensboro, and Lawrence Falk, Insurance Company of North America.

## Citation

Mapping and Programming Textual Materials, *Programmed Learning and Educational Technology*, 1 (1), February 1980: 20–26.

This research has also been reported in: D. H. Jonassen, *Recall and Retrieval from Mapped and Programmed Text*, paper presented at the AECT Convention, New Orleans, Feb. 1979; and in D. H. Jonassen, *Information Mapping: A Description, Rationale and Comparison with Programmed Instruction*, *Visible Language*, 1981 15(1): 55–66. □





# Schaffer: Better Reference-Based Training

## Problem

Which is better in a reference-based instruction situation in which the learner has to look up answers in a reference book: Information Mapping's method or standard text?

## Materials Used

The **original version** of a 140-page Time Reporting Manual.

"The selection was based upon the high quality of the existing document, its technical complexity, and the size of the user population. The current version has few errors in content and an exceptionally clear writing style. Also, the widespread use of the instruction multiplies the importance of the human performance characteristics of the document."

**Information Mapping Version.** One hundred eighty-five-page revised version developed by Information Mapping, Inc.

## Tasks

*Retrieval and Application Tasks.* "The tasks were generated by randomly selecting time reporting deviation codes from a pool of codes that are not generally known. The selected codes were then inserted at random into one of 2 formats. One question format involved the determination of a code's meaning using a multiple choice presentation. The other question format involved the determination of the appropriate code for a given situation. After each item a space was provided for the subject to record the time. In this way, 2 equivalent sets of tasks were developed, each containing 3 multiple choice items followed by 3 code determination items."

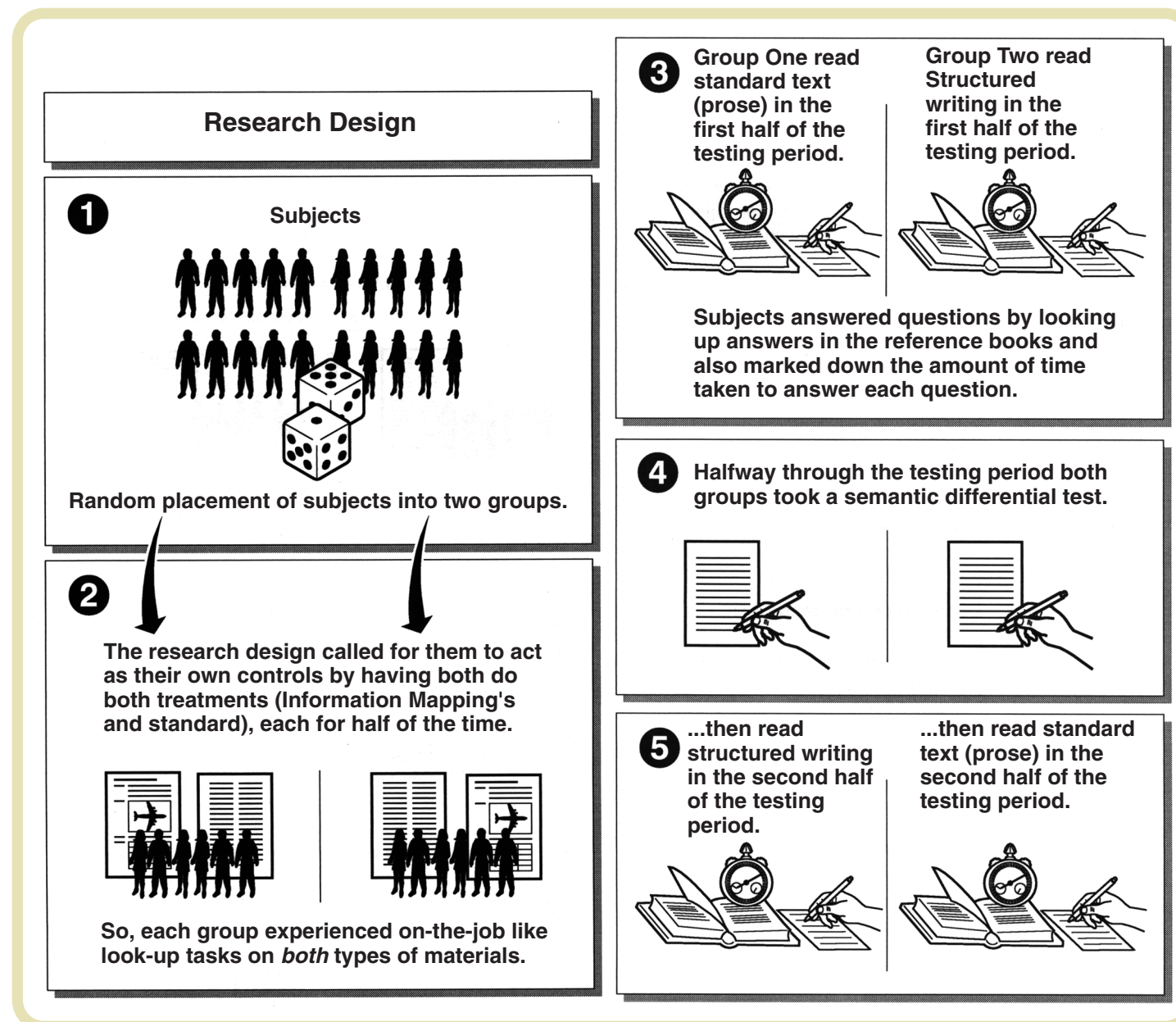
*Semantic Differential.* A pre- and post-semantic differential evaluation form was provided to subjects to assess perception of task format and feelings about the material.

## Subjects

Ten subjects: 7 female, 3 male.  
Average Age: 38.6.  
Job Type: 5 clerical, 4 management.  
Average Length of Employment: 10.2 years.  
Knowledge of Tasks: Subjects were screened to prevent inclusion of individuals familiar with the specific time reporting instruction tested on IM.

## Analysis

Time and error data compiled. Semantic differential scaled on 1-7 scale.



## Results

*Magnitude:*

*Time.* The version "had no significant effect on the time required to complete the tasks."

*Errors.* "Subjects made 54.5% fewer errors in the tasks when using the Information Mapping version of the instruction."

*Significance:* Yes.

*Subjectivity rating:* "The Information Mapping version was reported to be more 'modern,' 'clear,' 'not frustrating,' 'friendly,' and 'good.'"

"Of the 25 items on the final evaluation instrument, 12 revealed significant differences between the versions of the instruction  $\square(P < .05)$ ."

The Information Mapping version was described as follows:

- text rambles less
- divided into more logical parts
- table of contents easier to use
- type font not "too small"
- more "trustworthy" and "friendly"
- made subject feel more "satisfied," "confident," and • "in control"
- "easier to use"
- "easier to learn from"
- more of a "good, quick reference."

## Conclusions

"Although the current version is generally considered by management to be in 'good shape,' the Information Mapping version was significantly superior. Although the scope of the study is limited, the importance of writing quality is clearly demonstrated."

## Author

Eric M. Schaffer.

## Citation

The Potential Benefits of the Information Mapping Technique, NSPI Journal, 1982 (February): 34-38.

## Comment: Size of Task

Rarely do studies use reference and training materials of such a large size as those used in this study. This, together with the closeness of the experimental situation with on-the-job use of similar materials, makes this an especially significant study.

Also relevant here is the concept of reference-based instruction for training and on-the-job reference materials. -REH  $\square$

# Holding: Improves Writing of Business Reports

## Problem

Did the Information Mapping method of preparing business reports and the course for teaching the method improve the writing skills of managers to such a point that it resulted in improved communication? Did the course reduce the time it takes managers to write memos and reports to such a point that it created time/cost savings for Pacific Bell?

## Materials Used

R. E. Horn, Training Course Material for Effective Reports, Proposals, and Memos, taught in a 3-day format by Pacific Bell instructors certified to teach the course by Information Mapping, Inc., Waltham, MA.

## Task

Writing reports in an ongoing business setting after the course. Thus, the evaluation measured skills used on the job after training.

## Subjects

One hundred eighty first level managers of Pacific Bell.

## Results

### Magnitude:

**Decrease in Reading Time.** All of the supervisors surveyed state that the amount of time it takes to read a document, using the method taught in the course, has decreased. The mean decrease in the amount of time was 32% and ranged from 10 to 50%

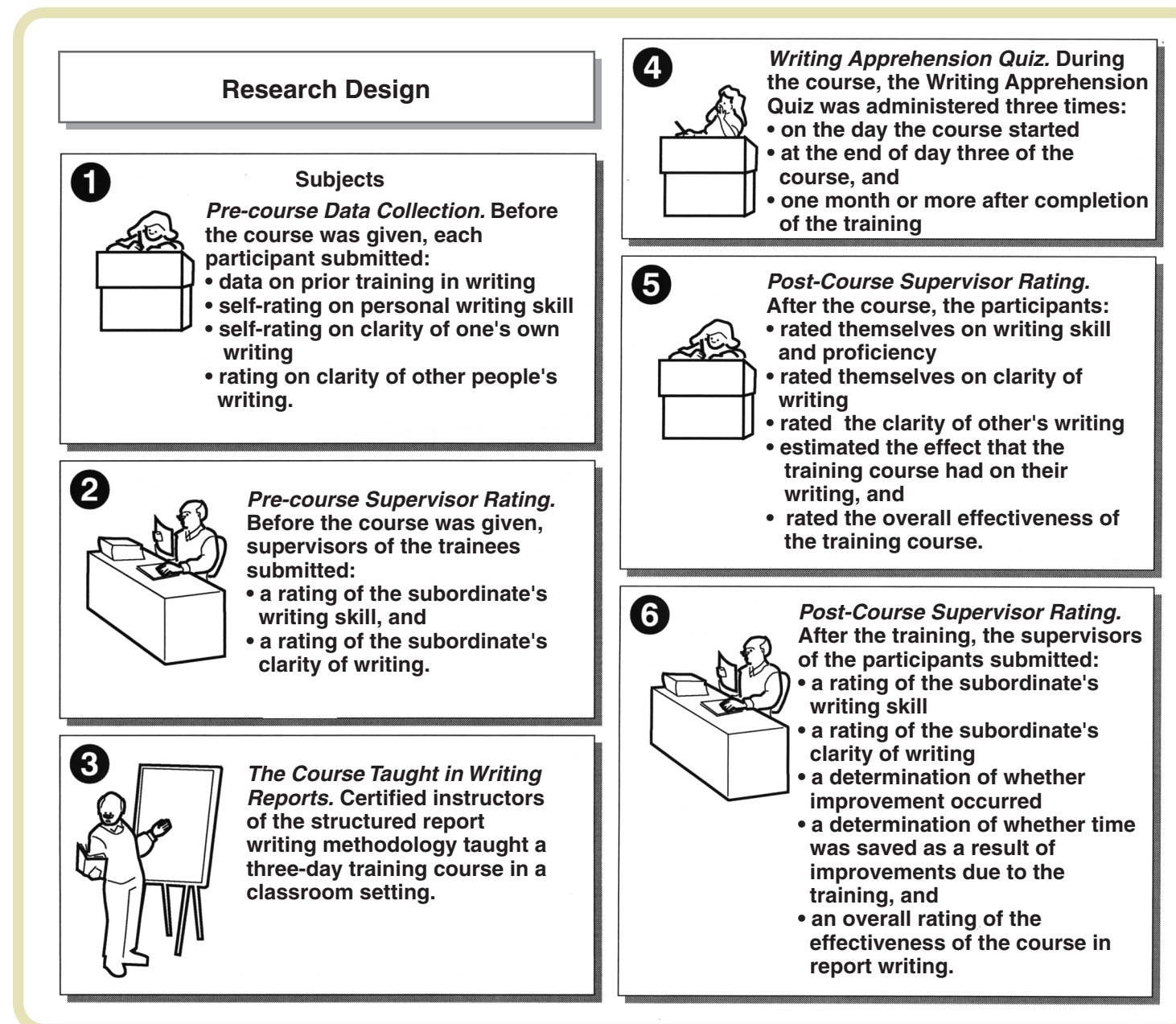
### Improvement of Writing Skills as Rated by Supervisors.

Before the course, supervisors rated the skill of the subordinates who took the course on a 7-point scale at a mean of 4.09; after the training, they achieved a mean rating of 6.00. These improvements in skill and similar separate ratings in clarity were attributed to the training course by all (100%) of the supervisors.

**Increase in Report Writing Speed.** Supervisors indicated that the writing productivity of the subordinates increased.

**Improvement in Analytical and Organizing Skills.** All of the supervisors also said that the course improved the analytical and organizing skills of the attendees.

**Significance:** Not reported.



## Other Findings

**Speeds up Organizational Processes.** Eighty-three percent of the supervisors reported faster approval rates due to the methods used in the course.

**Subjective Impression of Writing Faster and Saving Time.** Eighty-six percent of the first level managers who took the courses reported that the training either saved some or much time in writing letters, and 84.8% thought that it saved time writing reports. Thus, they agreed with their supervisors in this productivity measure.

**Completed Report Writing Before Deadlines.** The attendees also generally confirmed their supervisor's impressions that they wrote their required letters and memos before deadlines, suggesting that the course did have a positive effect on their writing behavior.

**Perceived Increase in Skill.** Participants perceived a significant increase in their skill that was directly related to the methodology taught in the course. The correlation between the ratings that participants gave themselves and those given by the supervisors was high. There was a corresponding correlation to the ratings that participants and supervisors gave in improved clarity of writing. A separate inspection of the prior training that participants had in writing revealed that this did not affect the ratings on perceived proficiency.

**More Complete Analysis.** Analysis of the data also showed that communication written using the method is more complete than that written in the traditional way, substantiating claims made by the developers of the method and course.

**High Effectiveness Rating to Course.** The overall ratings given by the supervisors to the course were:

- very effective, 63.0%
- effective, 29.6%
- somewhat effective, 7.4%
- not effective, 0%

## Author and Affiliation

Eva Holding, Pacific Bell.

## Citation





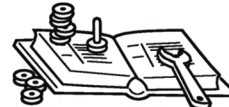
*An Evaluation of the Effectiveness of the Information Mapping® Methodology and "Effective Reports, Proposals and Memos."* San Francisco, CA. Pacific Bell, Oct. 1985. □ □



# Summary

## Introduction

The reader who has examined the results of the studies summarized in the two chapters will conclude that there are a variety of different ways to look at the quantitative benefits of using Information Mapping's method. On these pages we summarize the results from this chapter.

	Measured by Number Right or Number of Errors	Time to Do Task	Supervisor Appraisal
<b>Initial Learning</b>  <b>Immediate Recall</b>	<b>STELNICKI:</b> 32% higher scores on facts; 41% higher on concepts <b>SOYSTER:</b> 13% higher scores <b>ROMISZOWSKI:</b> 10% higher scores <b>BURRELL:</b> 53-59% better on tests <b>WEBBER:</b> 38% higher scores on the criterion texts	<b>ROMISZOWSKI:</b> 10% faster <b>WEBBER:</b> IM version was 50% faster	
<b>Long Term Recall</b> 	<b>SOYSTER:</b> No difference (attributed to motivation factors by the researcher) <b>WEBBER:</b> IM version provided 85% or better accuracy when starting on the job		
<b>Retrieval</b>  <b>Had Previously Used the Materials</b>	<b>JONASSEN AND FALK:</b> 33% higher scores with IM	<b>BAKER:</b> IM had 12-21% better reading speed	
<b>Had Never Seen the Materials Before</b> 	<b>SCHAFFER:</b> 54.5 fewer errors with IM		
<b>On-the-Job Application</b> 		<b>HOLDING:</b> Supervisors reported 32% decrease in reading time for persons receiving reports written in IM. 84% of IM users report increase in writing speed after taking course	<b>HOLDING:</b> Supervisors reported 100% of those who received training had productivity increase. Course was rated: <ul style="list-style-type: none"> <li>• very effective 63%</li> <li>• effective 30%</li> <li>• somewhat effective 7%</li> </ul>

**KEY**  
 IM = Information Mapping's method

\*The Soyster results on long-term recall may reflect nothing more than what much research has shown about memory, i.e., that human beings forget at a rapid and constant rate no matter how they learn. The only exception to this general condition is that people remember material they use frequently or that they learn to a level of fluency. Soyster's subjects learned to a "just barely can do" level and did not use the material in the intervening time. (For this reason, we recommend the use of "reference-based training," that is, training based on the immediate recall and retrieval properties of Information Mapping's method. Reference-based training is also sometimes referred to as "just-in-time training.")

# notes

## Chapter 1. Evaluating the Method

**2. Overview of Research Results.** For a comprehensive look at evaluation in an industrial training situation see Smith, 1980.

**6. Effectiveness: Does It Work at All?** For a description of this research, see Horn et al., 1969. Other researchers who have done effectiveness research are Cheung (1980), Fields (1982), Reid (1984), Mcclung (1985), and Olivares-Guerrero (1985).

**8. Comparative Effectiveness: How Does It Work Compared to Other Approaches?** Research mentioned includes Stelnicki (1980), Jonassen and Falk (1980), Romiszowski (1977), and Soyster (1980). Descriptions in the text in this and following pages may be located in the References section under the name of the researcher.

**10. Business Effectiveness: How Well Does It Work in Real-World Business Situations?** Studies referred to are Webber (1979), Shaffer (1982) and Sherman (personal communication).

**12. User Acceptance: Do Users Like It and Use It?** "Test in Statistics Class" see Horn et al., 1969. Pacific Bell anecdote (personal communication).

**14. Teaching Effectiveness: Can You Teach It to Others Consistently?** Data from reports of instructors from Information Mapping, Inc., and from Pacific Bell, AT&T, Boeing, DEC, and Canada Bell. "Romiszowski and Horn Report," both of the matrix algebra manuals are unpublished manuscripts. See Horn, 1985, for another account of the same data.

**16. What Other Operating Characteristics Do You Find?** Quotes are from Bixler, 1979.

**18. Does It Work under Difficult Conditions?** All of the data from Information Mapping's clients. "One of the largest real world situations ..." and "One of the Largest Personnel Manuals ..."; unfortunately, I can't cite more information because of non-disclosure conditions.

**20. Scaling Up and Scaling Down: Does It Work on Large as well as Small Projects?** Data from Information Mapping, Inc. survey (unpublished data).

**22. Does It Work in Very Constrained Situations?** "Some Typical Applications of Information Mapping's Methodology to Online Text." Data from survey of Information Mapping, Inc. project managers (unpublished data).

**26. Does It Work in Special Training Situations?** These 2 pages are based on an article by David Grebow and Robert E. Horn, "How Training Helped Wells Fargo Sell a New Service." Available from Information Mapping, Inc.

**28. Besides All That Efficiency and Effectiveness, Can You Provide an Attractive and Comfortable Journey?** Example 3 from Horn, 1989 (used with permission).

**30. Does It Increase Productivity?** Data from La Boissier (personal communication).

**32. Is It Cost-Effective for Its Mission?** Information Mapping has a publication that helps you estimate costs and benefits. Ask for *The Bottom Line*.

**36. Can You Measure Critical Variables in Its Components?** The relative numbers of examples and definitions are exemplary. Each subject matter would have slightly different measurements.

## Chapter 2. Research on Information Mapping's Method

**General note on Magnitude and Significance.** The reader who has examined the References will note that we have included blocks on magnitude and significance for each research report. Under magnitude, we report the size of the differences noted. Under significance, we indicate whether the researcher reported statistical significance for his/her findings. Statistical significance is concerned with whether the difference found in the research is reliable. Even a small magnitude (difference) may be reliable, while a seemingly large difference may sometimes not be reliable (i.e., statistically significant). In most research the minimal level of significance is .05 meaning that not more than 5 times in a hundred would these results occur by chance.

**44. Overview of this Chapter: Abstracts of Research.** The reader who has examined the References will note that we have not abstracted all of the dissertations that have been done on Information Mapping's method. There are several reasons for this. There are some duplicate findings. For example: Cheung (1980), Fields (1982), Reid (1984), Mcclung (1985), and Olivares-Guerrero (1985) simply confirm and add further support to a positive answer to the question (in Chapter 1) of "Does It Work?" and to the question of how it works on difficult subject matters. Skelly (1982) does not focus on the type of research questions we discuss in this chapter. Rather, he uses Information Mapping's approach as a baseline for several treatments of advance organizers. Tanenbaum (1988) similarly focuses on the question of inserting postquestions and the giving of feedback while using Information Mapping's approach as the baseline for different treatments. Hauck (1985) focused on possible differences between left-brain, right-brain, and integrated learning styles.

**58. Jonassen and Falk: Provides Significantly Better Retrieval.** Another study by Falk (1981) did not reproduce these results. For analysis, see Horn, 1991, in which I analyzed the Law of Getting No Effect (and, hence, making no significant difference) with respect to information retrieval, namely, anybody can retrieve anything from a small enough document, given an unlimited amount of time.

# acknowledgements

I would like to thank all of those researchers who have devoted so much time and effort to the investigation of Information Mapping's method. And I'd like to thank all of those dissertation supervisors who worked with their graduate students to accomplish this splendid research.

I would also like to especially thank Carl Binder, Dale Brandenburg, Don Cook, Doug Gorman, Steve Gussie, John Kelly, and Irwin Mesch for their comments on early drafts of this monograph. Cook and Binder were especially penetrating in their remarks and caused major changes in my thinking. The responsibility for the final work and any mistakes in it is, of course, mine.

Thanks also to Gail Sheehan for typing the early draft and to the outstanding production staff at Information Mapping, Inc. for doing the endless revisions, and thanks to Parvati Bergamo, Noel Black, and Ming Kendall for their exceptional editing and proofreading.

Robert E. Horn  
April 1991



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