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The development of two computerized study units: Demonstrating two instruction theories.

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UMI
The Development of Two Computerized Study Units

Demonstrating Two Instruction Theories

by

Victor Wiebe

A Thesis
Submitted to the
Faculty of Graduate Studies and Research
through the Department of
Communication Studies
in Partial Fulfilment of the requirements for
the Degree of Master of Arts at the
University of Windsor

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Abstract
Using one Instruction Theory for each, two Computer-assisted Instruction programs were created to teach the topic of Small-group Meetings. The Gagne-Briggs theory and the Inquiry theory of instruction were used for their usefulness to instruct in different situations: the Gagne-Briggs theory for classroom instruction, and the Inquiry theory for workplace-based training.

To assist in creating both CAI programs, work by David Jonassen (1986) was used as a step-by-step outline for the creation of hypertexts. This outline was also used as a model for the linear Gagne-Briggs based program.

Upon completion, each program was tested by student volunteers who examined the usefulness, overall cohesiveness, ease of use, understandability, and usefulness as an instructional project. It was expected that those who used the Gagne-Briggs based program would have a greater understanding of the general overall material, while those who used the Inquiry based program would have a better understanding of a few select areas.

Both CAI programs showed potential as instructional programs. However, it was unexpectedly seen that the students generally did not know how to use a hypertext based on the Inquiry method of instruction. It is hypothesized that this was due to this theory using a non-linear form of instruction as its basis, while the students were used to a linear form of instruction from years of schooling. Comments from the students seem to support this hypothesis, and it was concluded that instruction needs to be given on how to use this form of instruction before the instructional program can itself be used.

-i-
Finally, it was concluded that Jonassen's model of hypertext design can be used in conjunction with both theories of instruction to create effective CAI teaching programs. However, care must be taken to ensure that the learner understands how to best utilize the new form of instruction.
Acknowledgments
A thesis may be the work of one, but is the product and toil of many. There are numerous people without whom this thesis would never be complete.

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Chapter One - Introduction

"Learning is a kind of natural food for the mind." - Cicero, BC 106-43
"Education is the transmission of civilization." - Will Durant, 1885 - 1991

Introduction

Learning and education are prime means by which individuals learn to function and contribute to society. These contributions help societies to adapt, evolve, and move forward in a progressive manner, both economically and culturally. The educated become the leaders of society who have the burden of guidance and administration. With such an emphasis placed on learning and education, it is not surprising that education institutions do, and have always, play an integral role in the community.

As society’s demands become more complex, so do the demands placed on education. With cutbacks in funding for advanced educational institutions, the universities and colleges of today are faced with a large problem: how to educate as many people as possible with the wide variety of areas demanded by society, and in the most economical manner. It is perhaps not fair to place the entire burden of education upon universities and colleges: the home and the workplace must also share in this responsibility for learning to be effective. However, classroom teaching and workplace training are different, and should therefore not attempt to accomplish their goals using the same means, even if the subject material is identical or similar.

Classroom teaching has historically been geared toward instructing students in an overall field of knowledge, and can be considered “exam teaching,” due to its heavy emphasis on acquisition control. Workplace training, on the other hand, is geared toward
productivity and practice-oriented training, and instructs the student on how to use the knowledge.

*Computer-assisted Instruction* (or *computer-aided Instruction*, or *CAI* for short) offers a variety of new methods for instructing students in many areas, including classroom-based teaching and workplace-based training. As an electronic medium, CAI has the advantage of being easily distributed and reproduced (within the limits allowed by copyright) to larger audiences inexpensively. Additionally, CAI is highly adaptable to the desires and needs of both the instructor and student. This thesis will take advantage of the opportunities inherent in CAI to attempt to meet the needs of both students in the classroom and students requiring training in the workplace.

**Purpose**

As noted, CAI is a highly flexible tool to meet a variety of needs - this was seen most dramatically in a study conducted by the United States Military Academy in which the CAI tool adapted itself as soon as it was started, depending on the characteristics of the current user. (Carver, Howard, and Lavelle, 1996) Admittedly, this was an extreme. Few institutions other than the United States army would have the resources, manpower, or inclination to produce such a training tool, especially in a time of fiscal constraint. A more appropriate view of CAI's flexibility focuses on the manner in which it is implemented, and the uses to which it is put.

A printed book is rigid, linear, and unable to change its method of teaching to adapt to a specific subject. CAI, on the other hand, is more aptly suited to be altered for different uses. Quantum Physics and English Literature are not the same, and can best be taught in different ways, and CAI can afford them their individuality. A printed book, by
necessity and constraints, would approach teaching the two topics in the same manner (beginning with Step 1 on page 1, and ending with the last step on the last page), but a CAI program can be constructed with the unique characteristics of physics or literature in mind. Studies by Dee-Lucas (1996), Lemke (1993), and Butler (1995) show the different methods in which CAI has been used to teach. Dee-Lucas was able to show how CAI is used in different types of learning tasks, while Lemke explained that scholars do not read linearly and hence hypertext is a useful tool to them, and Butler went so far as to use the World Wide Web to disseminate all course material in one class with the exception of the textbook, exams, and course evaluations.

This flexibility will be used in this project to create different CAI applications geared to the classroom and the workplace, respectively. Each of the CAI programs will be based on a unique instructional theory suited for its particular purpose: the program designed for classroom teaching will use a common theory of traditional instruction, and the program designed for workplace training will use a theory more suitable for training, rather than teaching. The classroom-based program will use the Gagne-Briggs theory of instruction as its basis: the training-based program will utilize the Inquiry Model of instruction.

Briefly, the Gagne-Briggs theory of instruction is strongly geared toward classroom-based teaching; it is a very linear and step-oriented theory with strong emphasis on learner guidance by an authority, in this case the teacher or instructor. It is used primarily to require the student to learn a wide range of material and is focused on exam-writing to measure progress.

On the other hand, the Inquiry theory may be used more effectively than the Gagne-Briggs theory in workplace-based training. It focuses on the learners’ needs and
desires. As a result, this method more readily allows learners to examine different subsets of a knowledge area, instead of an entire knowledge area as demanded by Gagne and Briggs. This is useful in training situations as learners already have some experience in the topic. Therefore, learners do not need to learn everything on a topic, but rather want to complete their knowledge by focussing on aspects new or less familiar to them. However, even the Inquiry method remains a primarily passive method, with integrating practical exercises.

Additionally, this thesis will also test the viability of Asymetrix Toolbook as a CAI developing tool. Asymetrix Toolbook (or just “Toolbook”) is a hypermedia\textsuperscript{1} authoring tool for Microsoft Windows based computers and claims to offer the flexibility needed to construct a variety of multimedia applications, including teaching applications in differing formats.

**Rationale**

In reply to the increasing demand for education and the decreasing amount of funding, Computer-assisted Instruction has become more prevalent and widespread than ever before as an alternative teaching method. Many educational institutes have experimented with CAI to cope with the necessity to teach a large number of students, and many of those experiments have reached favourable conclusions about this mode of instruction. (See, for example, Garson, 1989; Newinan, Webb, and Cochrane, 1995; and Hiltz, 1993) However, the majority of this work has had a more practical than a theoretical basis. The result is that much effort has been placed on the practical aspect of CAI, with little on the theoretical. If CAI is to become truly effective in more than a few domains of knowledge

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\textsuperscript{1} The term "multimedia" is a catch-phrase used to encompass most, if not all, Microsoft Windows based CAI applications. The term was coined for its ability to use a variety of media (sounds, moving images, text) in a "hyper," or non-linear, method.
and specific learning styles (Crain, 1994; Beishuizen, Stoutjesdijk, and van Putten, 1994),
it needs to be based on theoretical work, and the source of this theoretical work is
instructional theory.

All indications are that, as our technological society increases its rate of change, education will become increasingly important, and there will be an increasing need to make our methods of instruction more effective, efficient, and appealing on a wide variety of contexts besides public education. (Reigeluth, p. 6)

**Content of the Programs**

The two instructional programs will present identical material concerning small-group meetings. This domain of knowledge is applicable to both students in an advanced education setting, and employees in the workforce in nearly any milieu. Students often work on group projects at school, and perhaps outside school, during their tenure in undergraduate and graduate studies, and effective knowledge of how to work in small groups is assumed to be useful to these students and projects. Furthermore, students will eventually graduate and move into the workforce, where they will need small group meeting skills for a number of purposes, ranging from job interviews to board meetings.

In the workplace, this program is designed to be beneficial for both those who have had plenty of experience in meetings already, and for those who have had little. The non-linearity of an Inquiry model based CAI hypertext offers advantages to both of these groups, in that information can be selected and retrieved in many different paths. An executive who attends several meetings a month might find this program useful in order to optimize meeting use and perhaps to improve meeting efficiency, while a union employee who has never attended a small group meeting at all would find the program
useful because it would still contain all the material required. To summarize, the topic of small group meetings was chosen because effective small group meetings can improve the working of many organizations and make their "users," experienced as well as novice, more productive.

Definitions

Before progressing to a discussion of the literature, the major terms and definitions that will be used throughout this thesis need to be summarized.

Hypertext

Hypertext is a method for organizing information that allows meaningful, non-linear access to text-oriented resources. Unlike traditional computer-based instruction and databases, hypertext systems allow the user to access information by 'jumping around' through a series of electronic links, whether in encyclopaedias [sic], textbooks, magazines, journals, databases, knowledge bases or other resources. (Gall and Hannafin, p. 207)

In short, hypertext is a non-linear method of presenting information. It is a method of cross-referencing that allows the user to immediately obtain information from any other point in the text which has that referent, with neither item necessary preceding or proceeding from the other. Contrary to popular belief, a computer is not a requirement for hypertext. A common example is an index, or an encyclopaedia: both of these tools can have information which points to more information elsewhere in the text. Although a computer is not a necessity for the existence of hypertext, it can facilitate hypertext. A computer enables a hypertext cross-reference to be "travelled" (i.e., for the new information to be obtained) at the click of a key or mouse-click, a much easier and faster process both physically and mentally than leafing through volume after volume of encyclopaedia.
Hypermedia

Hypermedia is an extension of hypertext. Whereas hypertext concerns itself solely with text (i.e., words and letters), hypermedia includes a wide range of media, from text to sound to still images and moving images with sound. Using hypermedia, it is possible to read an exposition on the hunting habits of lions in one portion of the computer screen while simultaneously listening to the roar of a lion or watching a video clip of an actual hunt! Similar to hypertext, hypermedia also allows the user to travel "links" from one area of knowledge to another; if, in our example, a lion is hunting an antelope, and the user would like more information on antelopes, a link could be travelled to make that information immediately available.

Computer-assisted Instruction (CAI)

Computer-assisted Instruction is a very broad term covering a variety of methods of teaching by computer. Various methods have included using e-mail, electronic bulletin boards, and electronic, on-line conferences to stimulate discussion (Klemm and Snell, 1996), using hypertext and the World Wide Web to provide additional lecture notes, supplementary readings, and exam hints (Butler, 1995), and employing hypertext and hypermedia as in-class and out-of-class projects in lieu of a textbook. (Beishuizen, Stoutjesdijk, and van Putten, 1994) A program can be said to be a CAI program when the computer adds significantly to the process of learning.

Gagne-Briggs Theory of Instruction
The Gagne-Briggs theory of instruction is "the classical" method of instruction, and is used by most teachers and professors in a classroom setting. This theory states that, for instruction to be most effective, the instructor must tell the student what is going to be taught, and what is supposed to be learned. In the process of teaching, the instructor will have the students' attention and will retain strict control over the students' progress at every step: progression to the next higher level of knowledge will not proceed until the student has achieved satisfactory mastery of the lower levels of knowledge, and the pace is usually dictated by the instructor. When finished, the student will have covered every aspect of the material offered by the instructor. The underlying belief is that the instructor is the master of knowledge, and that the student needs to listen to the master's direction to learn effectively. (See Aronson and Briggs, 1983)

**Inquiry Theory of Instruction**

The Inquiry theory of instruction can be considered in many ways the opposite of the Gagne-Briggs theory of instruction. Whereas the Gagne-Briggs theory is very strict, with a heavy emphasis on linearity and instructor control, the Inquiry theory is very open, with little or no emphasis on linearity, and strong learner control: this theory of instruction lends itself naturally to hypertext and makes full use of its theoretical promise.

With the Inquiry method of instructing, a learner is offered a number of issues which can be learned. The learner then chooses one of these issues and begins studying it. At many points in the open model, whenever a choice needs to be made as to along which avenue of knowledge to proceed, the learner will make that choice, not the instructor.
Inquiry is a more open system than the Gagne-Briggs system, and the learner need not cover all the material available. (See Collins and Stevens, 1983)

**Learning and Training**

In the context of this thesis, learning and training have different definitions and uses.

*Learning* is considered to be the partner to *teaching*, and is a process that takes place in a school-like setting. Learning is the process of mastering the material being taught, and a strong emphasis is placed on examinations to measure knowledge and improvement.

On the other hand, *training* is a process which takes place as needed in particular organizational settings or situations. The learner is only expected and required to understand the material which needs to be understood to be able to function in a certain position. It is assumed that the learner will have an interest in mastering the material in order to function effectively and work more productively. The difference between learning and training lies in theory as well as practice: a learning situation is one in which the understanding of the theory for examinations is paramount. In a training situation, skill acquisition is paramount.
Chapter Two - Literature Review
Media and Computer-assisted Instruction

The idea of using computers and other media education technologies to assist in teaching
is not a new concept: electric and electronic media have been incorporated into the
classroom for almost as long as they have been around. Early applications of media in
teaching included radio, television, the record player, and the overhead projector which
still survives today. (See Brown, 1969, and Kinder, 1973, for examples and uses of media
technology).

When computers began to come into common use in the home and workplace,
they found a natural niche in the classroom just as earlier media technologies had done.
Like their predecessors, computers were given a wide range of functions, from text-book
replacements to tools used to help in mathematics, to replacements for a classroom
lecture. Perhaps the single most important aspect of Computer-assisted instruction is that
numerous people can be reached with a variety of methods for a number of purposes and
instructional goals. There have been many research projects which have examined CAI.
(Welsch, 1982; Harasim, 1987; Mason and Kaye, 1989; Weedman, 1991) The partial
summary of ways in which CAI has been employed starts with projects involving CAI as
a medium among two or more people, and then proceeds to examinations of CAI as the
actual teaching product, characterized by teacher-learner role differentiation.
Electronic Guest Lecturing

Morton Cotlar and James N. Shimabukuro, at the University of Hawaii-Kapiolani CC, explored the topic of using an electronic conferencing system to hold guest lectures with academics and professionals from other institutions. (Cotlar and Shimabukuro, 1993)

Using the premises that 1) student learning increases with contact with the best instructors available; 2) face-to-face lecture sessions have reached the point of diminishing returns, and; 3) previous endeavors with guest lectures using previous technologies had serious limitations, especially in the areas of student questions and feedback, the authors researched the feasibility of a guest lecture by e-mail, where a lecturer at another institution would deliver a “lecture” by e-mailing it to the class of students, and the students could then e-mail the lecturer back with whatever questions they had. In addition, the lecturers held “electronic office hours,” at which time they would be available for immediate replies for e-mail queries.

This project did not examine any benefits students may have received from this form of lecture. However, it was found to be stimulating, and many messages were passed back and forth between the guest lecturer and the students. More importantly, however, this study showed that students responded better to such a lecture that was comprised of active verbs and personal words, than to a detached, “third person” lecture.

The Virtual Classroom

The “Virtual Classroom” was a major step forward in Computer-assisted Instruction in that it strove for specific changes in then current software to more closely emulate a
proper school. (Hiltz, 1993) E-mail and asynchronous “real-time” on-line software (i.e., software that allows people to communicate with each other at the same time) were implemented to mimic lectures through group-conferencing, “hallway conversations” through semi-private “chat room” conversations\(^1\), and even examinations were administered online to allow anyone in the class to access the material from wherever there is access to a computer with a modem, or a terminal with the proper facilities. The goal was to remove the physical classroom completely, and substitute for it a complete electronic equivalent.

Starr Roxanne Hiltz concluded that “The subjective student assessments of the Virtual Classroom as compared to the traditional classroom were favorable [sic]... In particular, there is support for the conclusion that the software and course delivery processes developed did encourage ‘collaborative’ learning.” (Hiltz, p. 86)

**Constructing Hypertext**

One of the most intriguing studies was conducted by Christopher R. Wolfe, and involved the use of hypertext. (Wolfe, 1995) Instead of reading a hypertext to teach students a topic, the students were required to create a hypertext to learn a topic. Wolfe broke his class into groups and gave them topics to research as groups. During class time they were allowed to work as a whole class to discuss the relationships among the material they found, where discrepancies were, and where more information was needed. During the last weeks of the class they brought their information together and constructed a final

---

\(^1\) A “room” is a portion of the software that allows a small group of people currently connected to the system to converse without letting people in other “rooms” “hear” them, and vice-versa.
hypertext. Wolfe’s underlying premise through this study was that the non-linear nature of hypertext espouses relational thinking rather than hierarchical thinking (Wolfe, p. 29), and he concluded that a research project of creating a hypertext is an excellent means to teach and promote critical thinking.

**Multimedia to Learn a Language**

The full use of CAI and multimedia to assist in teaching was shown by Isabel Borras when she compared the ability to speak French among students who had learned it from either a textbook or from a multimedia program. (Borras, 1992) In this project, the multimedia program offered the students not only spoken words, utterances, and phonemes, but was also able to listen to students through a microphone and speech recognition programming: these students were given no instruction other than that received by computer. She hypothesized that since traditional forms of teaching a second language (in this instance, French), offered the students few opportunities to speak and develop the language on their own other than repeating certain utterances, a multimedia program which did offer them this option would better enable them to improve their speaking skills. Her conclusions backed this hypothesis.

This study was instrumental in showing not only the interactivity of multimedia and CAI, but the importance of the program’s ability to offer immediate feedback and evaluation to let students know where they stand. The capacity to provide immediate feedback makes it possible for CAI programs to be designed so that students can not advance without having satisfactorily answered previous segments. This design feature gives CAI an advantage in teaching. (Messer, Mohamedali, and Fletcher, 1996)
CAI with Immediate Feedback

However, immediate feedback in CAI may not always be a good thing. A study was conducted in 1996 with CAI and children just under and just over the age of twelve, in which each student was shown an analogue clock (i.e., a round clock with an hour hand and a minute hand) on a computer screen; the children were asked to enter the correct time into the computer. (Messer, Mohamedali, and Fletcher, 1995) The students were then immediately informed whether their answers were correct.

For the younger students, that immediate feedback was found to be extremely beneficial in helping them learn to tell the time. However, for the older students, immediate feedback was not found to be as beneficial: the authors hypothesized that this was due to older students having more advanced mental capabilities, and a need to more fully think through an answer, both before and after inputting the response. The immediate feedback was hypothesized to cut short the necessary thinking process.

Debate still continues as to the need for and benefit of immediate feedback in CAI. J. Carter (1984) argued that high level cognitive information (i.e., theoretically complex material) should have a delay before feedback, so that students have an opportunity to “mull the answer” over in there heads before being told whether it is correct, and that there should be a way for learners to change answers. In contrast, B. J. Schimmel (1983) argues that immediate feedback is a necessity in such a situation because it allows the learner to immediately evaluate why the answer was correct or incorrect.

Hypertext

With the exception of e-mail, and perhaps computer conferencing software, most CAI programs use hypertext and hypermedia. The modern hypertext system has its roots in
1945 in an article by Vannevar Bush entitled “As we may think,” (Bush, 1945). In this article, Bush explains the need for a better system of information storage and retrieval due to the large growth of new information at that time. The system he proposed (called "Memex") involved a hybrid of microfiche and other technology available to him, and was surprisingly hyper textual. "[The human mind]... operates by association," he argued, and as a result, the information retrieval systems we use should also run by association. However, due to a general lack of support from scholars and those who would have benefited most from such a system, the idea faded.

In the 1970's several researchers (most notably Ted Nelson, who is credited with coining the word “hypertext” (Barnes, 1994)) proposed a hypertext system as we understand it today, to facilitate research. In contrast to Vannevar Bush's proposal for a Memex in the 40's, hypertext was received much more warmly, and when Apple Computer introduced HyperCard in the latter half of the 1980s it received positive feedback.

Apple Computer's HyperCard has attracted a great deal of notice because of the unique way it allows users to organize information. Users may associate or link data any way they wish... HyperCard's creator Bill Atkinson calls it a software creator set, Apple calls it an authoring tool, and now universities are beginning to use it as an audio visual aid extraordinaire. (Miller, 1988, p. 2)

Even at the outset, HyperCard was assumed and touted not just as a good teaching aid, but an extraordinary one. “HyperCard functions like an electronic reference librarian: Students associate bits or volumes of information on the screen while the subject is still fresh in their minds.” (Miller, p. 92) Miller boldly asserts: “we've all seen grades go up” as a result of HyperCard courseware. These were grandiose claims for a new and under-researched medium! The sweeping wave of publicity was enough, however, for
another company to create a HyperCard type system for IBM (International Business Machines) and IBM compatible computers (Byte, 1989) regardless of the confusion over the advantages and disadvantages these systems offer (see, for example, Williams, 1987). The following quote illustrates the underestimation the first users had of hypertext’s full capabilities.

... hypertext documents are much more flexible than conventional documents. For example, one can read the hypertext article just as one reads the conventional paper article by first reading the overview node, then the first section node(s), the second section, etc. However, one can also read the sections in different orders. (Smith, Weiss, 1988, p. 818)

Although a common statement such as this one seems innocent enough and shows an understanding of the non-linearity of hypertext, it does not show an understanding of the full implications of hypertext: merely reading a text in non-linear order is not revolutionary: indeed, anyone who can read at all can skip through a text. For example, the UNIX operating system has had “man” pages (help pages) since its outset. They are completely non-hypertextual, but they have completely eliminated the need for printed reference guides for simple commands.

A more prevalent view of hypertext at that time was of a tool for research and information retrieval. It was seen as a step above normal seek and find programs and procedures in that “hypertext’s appeal is that it more closely aligns with human thinking than conventional computing.” (Van Tyle, 1990, p. 70)

Advocates enthusiastically point out the similarity between human associative memory and the network of text fragments that allow freedom in linking ideas. While there are undoubtedly information search tasks that hypertext suits, promoters may fail to realize that the very same freedom of linking they admire can complication some research or learning tasks. (Marchionini and Shneiderman, 1988, p. 71)
David Jonassen (1986), Aks cyn, McCracken and Yoder (1988) and Andries van Dam (see Van Tyle, 1990, p. 70) all agreed that hypertext suits information retrieval well as it more closely imitates the human mind than other research practices. The implication of an immediate cross-reference, as hypertext offers, “allows for users to make connections between pieces of data,” (Miller, p. 92, quoting Dr. Bob Gross, professor of Biological Sciences at Dartmouth College). Through offering a way to retrieve information “like the human mind does”, hypertext was thought to be an effective teaching aid by allowing readers of hypertext to make connections among pieces of data found by cross-referencing and idea linking. However, aside from a few positive conjectures by those who implemented it in a class environment, the majority of hypertext knowledge by the end of the 1980's was under-examined and mostly hypothetical (Jonassen, 1986). In the early 1990's the focus of hypertext research proceeded from the ability to retrieve information to being an effective teaching aid, and it became much more involved in the teaching process. (See, for example, Fox, p. 246).

Researchers examined hypertext’s ability to teach students, comparing it to a printed text. In 1991, Michael Wenger and David Payne (1991) researched how different the cognitive demands of reading each were. This work grew out of Conklin’s work (1987) who thought that reading hypertext might be more mentally taxing for readers than reading linearly, as the reader not only needs to remember what is being read, but where it is being read in the hypertext. Wenger and Payne found that although processing hypertext does not require more cognitive resources than linear text, it “does impose more demands for relational processing than does linear text.” (p. 104) (emphasis added)

Specifically, it appears that the critical processing demand induced by requiring students to make sequencing and navigation decisions is one of relational processing. In essence, the task of selecting a path through a hypertext document requires that a reader make decisions and predictions
about the relationships among the various topics (as signaled by the labels of the links). (p. 123)

Statements like this reinforced the idea that hypertext not only does not teach the same way as traditional printed text, but that it does in fact assist in teaching its readers to make connections among what is being read, a view commonly held today: “Instead of a linear, page-by-page, line-by-line, book-by-book approach, the user connects information in an intuitive, associative manner. Hypertext fosters a literacy that is prompted by jumps of intuition and association.” (Heim, p. 30. See also Wolfe, 1995.) Such research also uncovered other previously overlooked topics, namely; hypertext is not a completely open system where a user can cross-reference anything; one can only associate or cross-reference along existing links. Links are created if they are deemed important enough by the creator of the hypertext. “The associations [in a hypertext] are not random. They are structured and systematically designed... This structured design aspect of hypertext eliminates ambiguous choices from the reading process.” (Barnes, 1994)

Research seems to indicate that hypertext lends itself better than linear text to teaching certain domains of knowledge. Gall and Hannafin (1994) believe that “Hypertext systems, especially those employing open-ended designs, tend to be more effective in promoting discovery and incidental learning than the learning of explicitly defined outcomes,” (p. 224). Non-linear knowledge domains, like communication theories, would be appropriate for hypertext, while chronological or linear domains, like literary and dramatic works, would not (see Conklin, 1987, and Raymond and Tompa, 1988).

The few reported positive cases of hypertext learning quickly led to a huge wave of hypertext-based units and courses, all in turn reporting mixed results with a positive tinge that hypertext was useful (Alexander, 1989; Crane and Mylonas, 1988; Tripp and Roby, 1990). Many results indicated the need for an open and very flexible hypertext
system which did more than mimic human thinking, and was adaptable to each learner’s learning style - the time had come for hypertext to go beyond imitating generic human thinking to imitating each individual user's thinking processes.

The most impressive study concerning hypertext and learning styles was conducted by the United States Military Academy, and involved a system so complex that it adapted itself to each learner's learning style when a repeat learner logged onto the system (Carver, Howard, and Lavelle, 1996). Needless to say, such systems involve an incredible amount of time and energy in installation and production (every item to be taught would need to be constructed several times over for each type of learner).

Additionally, the storage space required would be astounding; it should not be surprising that an endeavor such as this would be accomplished first by the United States military. Still others (Beishvizen, Stoutjesdijk, and vanPutten, 1994, and Williams, 1992) concluded that both learning style and study task were important factors in hypertext's effectiveness in teaching. There was a lot of confusion as to what hypertext was useful for, to whom, and in which situations. Gall and Hannafin (1994) summarized these fields of work when they presented a framework with which to study the effectiveness of hypertext teaching when created for learning styles and study tasks. Here is a quick summary of some of the uses of hypertext.

**Hypertext as a Searching and Browsing Tool**

Hypertext is an ideal instrument for browsing through texts. Browsing can be entertainment, or it can be a search for a particular piece of information, a task for which hypertext is especially suited. “Hypertext systems differ from existing on-line retrieval systems in that they encourage informal, personalized, content-oriented information-seeking strategies,” (Marchionini and Shneiderman, p. 71) a view agreed to by Girill and
Luk (1992) with the qualification that the hypertext has a strict hierarchy with each “hypertext strand” having a termination point. (Girill and Luk, p. 573) For browsing through large amounts of information, for either recreation or an in-depth search, hypertext seems to be ideal.

**Hypertext as an Assistant for Learning Writing Skills**

In 1992, the Division of Communication Studies and English at Sheffield City Polytechnic, in Sheffield, England began development of a hypertext package to assist student writers gain the skills required to be effective, professional writers. (Williams, 1992) Hypertext was chosen over other CAI techniques because it provided “flexibility in depth, [and gave] advice for student writers that is as contextualised and as detailed as each particular student requires.” (Williams, 1992, p. 125, my emphasis) The researcher, Noel Williams, was aware that “(e)ven hypertext materials cannot cope with unexpected needs. If a computer system is to be truly flexible, its design must take into account all possible problems and needs,” (Williams, 1992, p. 127) and that as a result, the end product will be “less flexible than the equivalent human contact,” and that “some students would not receive the materials best matched to their needs and abilities.” (Williams, 1992, p. 127) As his system was to teach skills, as opposed to facts, William's challenge was to create a hypertext system which allowed the students to interact with the material by actually manipulating it, instead of just responding to it.

The final product was very analogous to a multi-threaded tree-like structure with certain elements and “branches” of the hierarchy disabled to fit any number of a series of limitations (e.g., a time limit, or to assist students in different levels of advancement). (Williams, 1992, p. 134) Such disabling was possible because each branch was unique and self-contained and did not have links pointing to other branches, resulting in a very
Socratic dialogue with the student, and hence being very akin to an Inquiry model of instruction. In this way, Williams was able to produce a hypertext that was more "skills-oriented" than "fact-oriented."

**The Cognitive Demands of Hypertext**

As hypertext applications were being used widely to assist in teaching students, several researchers began looking at the cognitive demands, or "mental overhead," that the act of reading hypertext demands. (Wenger and Payne, 1991) This grew from Conklin's (1987) work who suggested that hypertext demands higher levels of working memory which would lead to longer reading times, and that reading hypertext would demand more item-specific and relational processing.

Wenger and Payne's major conclusion was that

... measures taken while reading [show] that processing hypertext does not appear to require more cognitive resources than does processing linear text... A second conclusion to be drawn from these results is that hypertext appears to impose more demands for relational processing than does linear text. (Wenger and Payne, p. 104)

This conclusion implies that the reader takes a much more active role in reading a hypertext than a linear text as decisions and predictions as to what is important and related must continually be made.

**Teaching Teachers About Hypertext**

In 1996, noting that many teachers had difficulty learning the uses of hypertext and understanding how it could fit their teaching styles, D. Lee and A. C. Pan looked into some of the reasons why this might be. (Lee and Pan, 1996)

They concluded that the instructors who teach other instructors about the uses of hypertext are computer professionals without knowledge of adult learning, and not
instructors themselves. Therefore, even though they may have excellent hypertext skills, they may not only have difficulty in passing those skills on to others, but lack an awareness of the issues involved in adult learning which is required to ensure successful adaptation of the new software.

**Small Group Meetings**

The material which would be taught in the two CAI programs to be developed consisted of information on how to improve personal productivity in small-group meetings. For such a product to be respected, the information needs to originate from qualified sources. Consequently, the majority of the published sources chosen had a professional focus and were geared toward making meetings more effective, in contrast to pamphlets and leaflets which may contain only brief outlines of what constitutes a meeting. (O'Conner, 1980; Jones, 1980; Finkel, 1976; Delbecq, 1975; Doyle, 1976) This group of books, although focused intensely on professional board meetings with little regard to other, more informal meetings, had good discussions on the theory of meetings (why they exist, and what their purposes are), and walked the reader through the steps of a meeting.

A few books (Schindler-Rainman and Lippit, 1977; Jorgensen, Scherer, and Fautsko, 1981; Tropman, 1980) had as their main focus how to organize meetings and problem-solving techniques to be used in meetings. Their main premise was that a well-organized meeting should have no problems to be solved, other than those problems that the organization as a whole must solve for continued survival.

The last book, *The Zen of Groups*, tackled the problem of how to improve the usefulness of meetings in a completely non-traditional way. (Hunter, Bailey, and Taylor, 1995) Instead of viewing meetings as a series of problems to be solved, this book viewed them as a series of personal challenges to be overcome. With this angle of focus, much of
the book offered, for example, both personal and group exercises on how to overcome public speaking problems, how to be able to listen to criticism without getting angry, and exercises on various methods to generate ideas on virtually any topic. The authors' aim was to allow meeting participants to clear their heads and focus easily on what must be done.

The literature was useful in helping to understand the basic organization of meetings both linearly and conceptually. Some of the literature had explained meetings as a linear, step-by-step process; (O'Connor, 1980; Jones, 1980; Doyle, 1976) this information was used to form the basic thrust of what would be taught in the computer programs. The remaining works were used to provide additional material. As an example, *The Zen of Groups* was used not to instruct the learner on an aspect of a meeting, but to instruct the learner on how to generate ideas (as an example), which is an integral part of a meeting.

**Instructional Theory**

Charles M. Reigeluth described instructional design as a “linking science” between learning theory and educational practice, “a body of knowledge that prescribed instructional action to optimize desired instructional outcomes...” (Reigeluth, p. 5) He specified that

... instructional design as a discipline is concerned with producing knowledge about optimal “blueprints” - knowledge about diverse methods of instruction, optimal combinations of methods (i.e., whole models), and situations in which each of those instructional models is optimal.” (Reigeluth, p. 7)

The two instructional design theories that will be used in this thesis are the Gagne-Briggs theory and the Inquiry theory of instruction. What makes *instruction* unique from
Learning, per se, is its focus on how the material is presented by the instructor, rather than how the material is understood by the learner.

Reigeluth mentions three components of an instructional theory, all of which play an active role in this thesis. The first are instructional methods, or “different ways to achieve different outcomes under different conditions.” (Reigeluth, p. 14) In this process of creating two different CAI units, each for a different condition (one for professional training and one for academic education), different methods of presenting the information will be used. The academic version, with its necessity to teach overall knowledge, will use a method of presenting information that requires the student to read it all. Conversely, the training version, without a need to cover all the material, will be presented so as to allow the learner to choose his/her learning path and the topics to be learned.

The second component in an instructional theory are instructional conditions. These are “factors that influence the effects of methods and are therefore important for prescribing methods,” (Reigeluth, p. 14) and are generally beyond the control of the designer of the material. Such a condition is anything that affects the course of instruction, such as nearby loud construction or an unruly, disruptive class member. An instructional theory should have a method of dealing with these variables as they arise, but they cannot be formed into a pre-constructed design.

The final component in an instructional theory are the instructional outcomes, which provide each alternative instructional method some form of value after instruction has occurred. (Reigeluth, p. 14) These outcomes can be actual or desired, with the desired outcomes being those intended by the instructor, and the actual outcomes being the ones the instructor has just partial control over. Each CAI unit in this thesis has a different desired outcome: the education-version has the desired outcome of teaching the
student about all the aspects of a meeting. The training-version has a desired outcome of allowing a reader to learn about learner-selected aspects of a meeting to help him or her improve meeting performance. To better understand these three components the next section will present more in-depth explanations of how each model of instruction will be used.

The Gagne-Briggs Model of Instruction

The Gagne-Briggs model of instruction is readily associated with the "traditional school" type of instruction, in which the teacher tells the students what they will learn, and in what order. This model offers assistance in "the nature of instruction for... three domains of knowledge," which are cognitive, affective, and psychomotor (Petry, Mouton, and Reigeluth, p. 11). Unlike the Inquiry model which promotes critical thinking and self discovery, the Gagne-Briggs theory promotes linearity- and causality-oriented methods of learning.

The Gagne-Briggs model focuses, as mentioned, the control of learning on the material being taught as opposed to allowing the learner to direct the learning in a unique direction. This model subscribes to the idea that learners do not know what is best for them in a learning environment since the material is new to them, and that guidance is best left to the educator (in this instance, the educator is the instruction text or hypertext).

In this model of teaching, the instructional method is very rigid and hierarchical and consists of nine more-or-less sequential events.

1. Gain the learner's attention.
2. Inform the learner of the lesson objective.
3. Stimulate and recall the learner's prior knowledge.
4. Present the stimulus material with distinctive features.
5. Provide learning guidance.
7. Provide informative feedback.

Aronson and Briggs (1983) mention that the most widely used Gagne-Briggs application is in teaching “intellectual skills,” which means “using concepts and rules to solve problems,” (p. 81). In particular, “intellectual skills” learning capability is comprised of five parts.

2. Rules (demonstration of application).
3. Defined concepts (classification and categorization).
4. Concrete concepts (identifying instances of concepts through examples).
5. Discrimination (identifying differences among differing stimuli).

A meeting is an intellectual skill. Meetings consist of higher-order rules: problems, as they arise, must be solved. Presumably, these problems would be different from meeting to meeting and problem to problem, so a new problem-solving rule must be generated for each problem. The CAI will instruct the learner on how to solve problem.

Meetings also have applied rules (the rule must not only be generated, but it must be put into use) and defined concepts (a distinction is made between regular speaking and asking a question, as an example). The learner will then be taught how to identify these concepts; lastly, the CAI program will help the learner in understanding the stimuli for aspects of a meeting.

The instructional, desired outcome of this CAI unit is to create in the student a greater familiarity with the meeting process, based on an understanding of the theory of meetings; this will enable students to solve problems related to meetings as they arise at the same time and give students an understanding of how to make meetings more efficient and more enjoyable.
The Inquiry Theory

The Inquiry Theory of learning puts the focus of control of the learning process onto the learner, and works from the assumption that the learner has a specific goal in mind. This theory and its instructional method is more of a "discovery approach." The "teaching tool" can provide guidance, but must be open for choices of paths by the learner, as opposed to forcing a rigid outline structure. Expecting the learner to have a specific goal to work towards makes this model of instruction ideal for training situations where learners with varying backgrounds may need only learn a few things to improve their performance, or where learners are attempting to learn rules to help solve a particular problem. (Collins and Stevens, p. 252) For example, executives who have attended a number of meetings may wonder why their lower level managers are quiet during meetings and offer little or no input. By following a series of causal links (perhaps starting with, "Speaking during meetings" and other links from it), the executive should be able to better understand why people participate in meetings and, as a result, why they would not participate.

The roots of the Inquiry method can be traced back to the Socratic Method, in which the teacher merely provides guidance to the learner, as opposed to telling the learner what to learn and, eventually, what the only correct answer is. Through a series of questions on the topic, the learner is forced to think the issues through for him- or herself.

An example dialogue continuing the previous example would go as follows.

Student:> I’d like to understand why my managers don’t participate in my meetings.
Teacher:> Very well, at which point of the meeting do they not participate?
Student:> They never offer ideas for improvement. I’m the only one who ever generates an idea.
Teacher:> Do they participate at other points in the meeting?
Student:> Oh yes. They all give their reports when I ask for them.
Teacher: So, let's look then at why they don't tell you any ideas. They're not shy, or they wouldn't give their reports so willingly. What else could there be?

Through a series of questions and answers (causal links), the student is required to focus the field of study on his or her own until a manageable and focused topic is reached, and an acceptable answer is obtained. Considering the web-like nature of this method of learning (pending on the students desires and answers, one of many different finalities could be reached), it seems that it would lend itself naturally to a web-form based hypertext.

Inquiry instruction has three component parts. 1) The goals of the teacher; 2) the strategies the teachers use; and, 3) the control structure governing their teaching. (Collins and Stevens, p. 257) Teachers who use inquiry teaching have two goals; first to teach students particular rules or theories, and second to teach students how to derive rules or theories. The example above represents dialogue in which the student is about to learn how to derive a rule, which will help him or her understand why the managers are not helping to generate ideas.

There are 10 strategies teachers can use in Inquiry instruction, all of which force the student to examine the issue from a slightly different angle.

1. Selecting positive and negative exemplars (of the issue at hand).
2. Varying cases (examples) systematically.
3. Selecting counterexamples.
4. Generating hypothetical cases.
5. Forming hypotheses.
7. Considering alternative predictions.
8. Entrapping students.
9. Tracing consequences to a contradiction.
10. Questioning authority. (Collins and Stevens, p. 260)
Through any of these 10 dialogue strategies, a teacher is able to help the student focus the problem. As an example, the executive in our example may come to the conclusion that, "My managers must not care. If they did care, they’d help me come up with a way to lower the cost of producing left handed C-clamps during our meetings." The teacher may respond by testing the executive’s hypothesis while simultaneously tracing it to a contradiction.

Teacher> You are sure that they’re lazy and don’t care. I thought they all had to work for three years as sales agents before they could become managers. Is that true?
Student> Well, yes, but maybe they just stayed on to get the higher paying job.
Teacher> Didn’t you have other sales representatives, then, who could have done it?
Student> Yes...
Teacher> Then why did you choose these particular ones?
Student> Because they were hard-working and did their jobs well. Okay, maybe they’re not lazy, and they do care. So there must be something else.
Teacher> You say they don’t help in meetings. Are they given the opportunity?
Student> We have a strict agenda and time-constraints! We can’t afford to stray...

The final component of inquiry teaching is the dialogue control structure, which is itself comprised of three items. The first of these is a set of strategies for selecting cases with respect to the top-level, desired outcome. (Collins and Stevens, p. 274) These cases should illustrate the more important factors before the less important, and should also be representative of the more frequent cases over the less frequent ones.

Secondly, a dialogue structure in Inquiry teaching needs a student model which, ideally, is unique from student to student. As the teacher questions the student and learns more of his or her current knowledge and needs, the model is formed accordingly.
(Collins and Stevens, p. 275) Only a few CAI programs can currently attain such a goal (see, for example, Carver, Howard, and Lavelle, 1996); the remaining programs attempt to approach this goal as much as possible through a complex series of hyperlinks to make it seem as if questions are being answered. Boolean links work well in this regard. Here is an example dialogue in this regard.

- Are you the supervisor or regular participant of meetings?
  \textit{<Participant>}
- Do you want to learn about material before, during, or after a meeting?
  \textit{<During>}
- Do you want to learn about idea-generating techniques, listening skills, speaking skills, or giving reports?
  \textit{<Idea-generating techniques>}

As this form of questioning continues, the learner feels as if the CAI unit is actually assisting him or her in focusing on the problem area when, in fact, it is really only providing the learner with pre-arranged topics from which the learner cannot stray.

The final component in an inquiry-based control dialogue is an \textit{agenda}.

As specific bugs (i.e., errors and omissions) in the student's theory or reasoning processes are identified, they create subgoals to diagnose the underlying causes of the bug and to correct them. Often the questions reveal multiple bugs. In such cases the teacher can only pursue one bug at a time. Thus there has to be an agenda, which orders the subgoals according to which will be pursued first, second, third, and so on." (Collins and Stevens, p. 275)

Again, all but the most advanced systems must rely on an alternative to a true agenda-system as described, as it requires true interactivity and adjustments as the learner continues. However, a properly constructed hypertext system should allow the learner the opportunity to correct these "bugs" as they appear with properly placed hypertext links.
The drawback is that this assumes the learner knows an error exists in his or her thinking in order to be able to search out the relevant hyperlinks.

**Gagne-Briggs and Inquiry: How they Differ**

The Gagne-Briggs and Inquiry models of instruction can be considered polar opposites. Whereas the Gagne-Briggs model places emphasis on step-by-step instruction, the Inquiry model focuses on learning what needs to be learned, which is different for every learner. There are other opposites as well, from the place of instruction to how the learned material should be done. Table 2.1 summarizes the main differences between the two as they are applied to this thesis.

With these two theories, and based on the differences between them, this thesis will consider the development of two computer-assisted instruction (CAI) units, each based on one of the theories. The first, based on the Gagne-Briggs model, will be intended for a classroom audience in a school setting. The material to be learned will be dictated to the learner, and testing will occur at regular intervals to allow or disallow progression to the next unit. This program will have as its desired outcome a good understanding on the part of the student of why small group meetings exist, what they are comprised of, and how to make them efficient. As a result of its strongly linear base, this will be a CAI program, but it will not be a proper hypertext.

Conversely, the program based on the Inquiry model will be a hypertext. This hypertext’s intended audience will be professionals and others who regularly attend small group meetings. These learners will not be required to learn all the material as the classroom-learners, but rather will be allowed to learn what they feel is important, and study the areas in which they feel they need training. On-line examinations will be
available for guidance and to allow the learners to know which points in the hypertext are the most important ones to focus on.

Table 2.1 - Summary of Instructional Theory Differences

<table>
<thead>
<tr>
<th>Aspect of Instruction</th>
<th>Gagne-Briggs</th>
<th>Inquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus of Control</td>
<td>Instructional material</td>
<td>Learner needs and desires</td>
</tr>
<tr>
<td>Testing - When</td>
<td>Directly after each unit</td>
<td>When needed for guidance or desired</td>
</tr>
<tr>
<td>Testing - Purpose</td>
<td>To examine progress and allow for progression to the next unit, or to require repetition of the previous unit</td>
<td>To offer guidance to the learner to understand what is important in the material</td>
</tr>
<tr>
<td>Testing - Where</td>
<td>At point of instruction</td>
<td>Wherever the learner and the instructional material may be together</td>
</tr>
<tr>
<td>Testing of Hypotheses</td>
<td>Not allowed</td>
<td>Allowed</td>
</tr>
<tr>
<td>Type of Learner</td>
<td>Rigid, linear learners who want to be told what to learn</td>
<td>Non-linear learners who want to learn as needed</td>
</tr>
<tr>
<td>Intended Audience</td>
<td>Primarily students required to learn all material presented</td>
<td>Primarily professionals in a training situation, not needing to learn all the material presented</td>
</tr>
<tr>
<td>Learner Preparation</td>
<td>Prerequisite material to be read</td>
<td>Understanding of the problem to be solved</td>
</tr>
<tr>
<td>Order of Content</td>
<td>Rigid, linear progression. Fixed</td>
<td>Loose, non-linear progression. Variable</td>
</tr>
<tr>
<td>Order of Testing</td>
<td>Linear, after each unit, as proscribed by the instructor</td>
<td>Non-linear, when the learner feels guidance is needed</td>
</tr>
<tr>
<td>Learner Goals</td>
<td>To be told what is important to learn, and what to learn</td>
<td>To know what is needed to be learned, and learn it</td>
</tr>
<tr>
<td>Instructor Goals</td>
<td>To teach the student all the material in each unit</td>
<td>To enable the student to learn what the student needs to know</td>
</tr>
<tr>
<td>Place of Instruction</td>
<td>Typically a classroom</td>
<td>Wherever instruction will best induce learning</td>
</tr>
<tr>
<td>Mode of Instruction</td>
<td>Rigid, fact-based</td>
<td>Loose, rule-based</td>
</tr>
</tbody>
</table>
Chapter Three - Designing the Units

The authoring tool of choice for the two CAI units was Asymetrix Toolbook, version 5. This is a Microsoft Windows 3.1 based program that met the requirements for this project: first, it is portable and easily distributed: it runs on any computer running Microsoft Windows 3.1, Windows 95, or Windows NT 3.51 or later, and requires only a 386 or better CPU with a minimum of 8 megabytes of RAM, although a 486 or faster CPU with 16 megabytes of RAM is recommended. Secondly, with new Java technology and Netscape plug-ins, distribution can be arranged easily over the World Wide Web to anyone with Internet access. Also, the module can be distributed in runtime files that do not require purchase of Asymetrix Toolbook itself. The runtime files can be distributed free of charge, as long as the author owns a legitimate copy of Toolbook; however, the learning module cannot be edited by the end users. Finally, it is flexible. The same basic code and commands can be used to create CAI aides of a diverse nature.¹

Jonassen (1986) outlined a series of steps to be followed in the creation of a hypertext program. Although designed for the purpose of creating a hypertext (as opposed to any other form of CAI), the same process can be used for other CAI programs besides. Jonassen's (1986, pp. 285, 286) steps are as follows:

1. Identify all key concepts. “The basis of hypertext is the concept structure, so first we need to identify all the related concepts that will become blocks and frames in our text.” (p. 285) All of the related concepts that need to be included within the application

¹ For more information on Asymetrix Toolbook, visit Asymetrix's website at http://www.asymetrix.com.
need to be identified. For example, in this project on small-group meetings, all of the concepts that make up “small-group meetings” need to be identified, including such things as agendas, how to generate ideas, and how to speak in front of a group. This is true for any text but especially true for hypertext where the possibility for redundancy is great. Jonassen suggests using “free word association” to list the key concepts in the subject matter, and then rank each concept in importance to the subject manner.

2. Map the structure of the content. The relationships among all concepts obtained in step one are mapped, and a tree- or web-like composition (in the case of a hypertext) or any other composition (in the case of other forms of CAI) is constructed. Determining these relationships assists in establishing the links between nodes in a hypertext.

As an example, meeting minutes and an agenda are both written documents, one of which presents information that was discussed at the last meeting, and the other of which presents information which will be discussed during the upcoming meeting. Relationships between these two items need to be made since they are inherently related. They also need to be mapped to other items and documents (perhaps written reports) on an individual basis. Each concept in this way is related to each other.

3. Verify the structure. Someone other than the author, preferably an expert, looks over the relationships and materials created so far. Any discrepancies between the two “maps” need to be reconciled at this point.

4. Determine the type of hypertext structure. “If you are planning a structured hypertext, decide the type of structure you are going to impose on it.” (p. 285) Depending on the needs and desires, one hypertext need not have the same design as another. The
structure can be branch-like, with each branch a separate entity, as the one designed by Williams (Williams, 1992), or it can be more open with links among the branches. This structure should reflect the map developed in step 2: if that map had been properly constructed from the inherent relationships in the concepts, then the structure developed at this point should flow logically from those relationships and appear to be “natural.”

5. Prepare the concept blocks. The text for each frame, or “black box,” is written. For a hypertext, each of the sub-sections (concept blocks) should be complete onto itself and should not need another frame to be understandable: other forms of CAI may not have this requirement. Another outside reader should then verify the content.

As an example, the concepts of speaking, asking questions, and facilitating each need their own “black box,” even though they are all closely related. Links will be made among the sections, if needed due to their similarities, but none of these concepts should require any of the others to be understood.

6. Provide links and cues to other concepts. “Determine the method by which frames within blocks and blocks (concepts) within the hypertext will be linked.” (p. 286) The form of links and cues can take a variety of forms: the hypertext can be linked by an index, a table of contents, text-matching, or from a certain word. Any or all of these can be used, but the choices made should reflect the map and structure decided in steps 2 and 4.

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2 A “Black box” in this instance is a self-contained text, like a paragraph or page, which does not need any other text to be understood: it is completely self-explanatory. The benefit of such a black box is that the text can be “picked up” and moved to other texts without needing to be re-written and can be used repeatedly for various projects.
7. *Debug the system*. "Try out each and every option in the hypertext to be certain that the system performs faultlessly." (p. 286) With the completion of this last step, the hypertext or CAI program should be ready to be implemented.

1. **Identifying the Key Concepts**

Jonassen’s first step, identifying all the key concepts, necessitates having information with concepts to identify. For this project, the information in question was about small-group meetings. To limit the extent of information to be included, each small-group meeting concept had to meet the following criteria.

- The material needed to focus on small group meetings of any sort. Board meetings, community club meetings, and small class meetings that ranged from 3 to 15 participants were included. Excluded was material which focussed on substantially larger meetings, such as large conferences or share-holder meetings.

- The material had to cover meetings that were, at most, only a few hours long. This excluded day-long or longer retreats and conferences or “in-house” meetings with multiple events.

- The material needed to be culturally neutral. It could not claim that, for example, all people regardless of origin have the same desires and wants from a meeting and, as a result, there is only one good way to hold a meeting. People from different cultures may not have the same desires from a meeting: in fact, it is quite probable that the members of a meeting already do not have the same desires for it, regardless of national origin. In short, all material needed to be as un-biassed as possible.

- Finally, the material needed to be relevant for overall meeting efficiency, and not be tips and tricks for a single person to get his or her way. A group meeting should not be treated as a forum for individual agendas.

After all the material had been sifted through and filtered using these criteria, the resulting information was further distilled into relevant concepts for the two programs.
For example, since there was plenty of information on communication during a meeting, that topic was viewed as important. Similarly, information on other issues, such as how to generate ideas to solve a problem, and how to prepare written and verbal reports, was deemed to be important based on the frequency and quantity of coverage by experts in the field. These topics were therefore included as key concepts and flagged for further use.

2. Mapping the Content Structure

This was a relatively simple step, but a vital one for the further development of the two programs. This step gave each program its own “look and feel,” as the concepts developed in the first step are mapped to form the general flow of the program: in the case of the Gagne-Briggs CAI program, the flow was mapped as a linear progression. The Inquiry-based hypertext had a web-like form as the links were mapped conceptually.

In the Gagne-Briggs based version the concepts were related to each other in a linear manner. The model prescribes that the student cover all the material and do so in a step-by-step manner (i.e., the student must have an understanding of each step before going on to the next one). Consequently, the material was mapped, or grouped, into a linear structure with pre-requisites, resulting in three units: one unit for material before a meeting begins, one for information needed about how meetings are conducted in the time allotted, and one unit for material after a meeting has ended. In addition, materials needed by regular meeting participants was separated from materials needed by meeting chairs or organizers. As a result each unit was broken down into further sub-units, one for chair people, and one for regular participants. These relationships are presented graphically in Table 3.1.
Table 3.1 - Gagne-Biggs Program Relationships

<table>
<thead>
<tr>
<th>Main Unit</th>
<th>Sub Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the Meeting</td>
<td>Chairperson</td>
</tr>
<tr>
<td>During the Meeting</td>
<td>Chairperson</td>
</tr>
<tr>
<td>After the Meeting</td>
<td>Chairperson</td>
</tr>
</tbody>
</table>

Conversely, the Inquiry-based hypertext was mapped on a more conceptual level: instead of grouping items into units, like the Gagne-Biggs CAI did, the mapping for this hypertext was done item by item, as each item could be related to any other, regardless of a particular linear order. For example, the agenda was grouped into the Before a Meeting category in the Gagne-Biggs application, but it can also be related to keeping a meeting on track and idea-generating techniques, both of which fall into the category of During a Meeting. In the Inquiry-modelled hypertext, links among these items were mapped, whereas in the Gagne-Biggs application they were not.

3. Verify the Structure

The mapped structures were taken to the committee overseeing this project for verification. This committee consisted of three professors, all of whom were experts in some aspect of this thesis: one of them was an active organizer of meetings and training sessions, and his input into the material itself was invaluable. Another was an expert in instructional theory, and he examined the conceptual links and how they followed from the models. The third has had experience in chairing graduate program and other meetings, and was able to offer insight into the reality of the material so far presented.
4. Determine the type of hypertext structure

The next step was to put the information content into the instructional formats, and to realize the planned linkage structure. As the Gagne-Briggs application was being mapped in step 2, it was simultaneously also being written. The theoretical order of these steps was violated here, but it was felt that the practical application would help in the conceptual mapping. The result, however, was that the strict focus was lost: the original Gagne-Briggs unit had an interface which was a cross between the Gagne-Briggs and Inquiry models. On the left hand of the application window a hyper-linked Table of Contents was constantly available which enabled the user to move immediately to any one of the units or sub-units, without being restricted by the order imposed by the instructor (the program). Each sub-unit on the right side of the window, however, was strict in its imposed order and did not have hyper links to other sub-units, although it did contain hyper links within its own sub-unit.
This structure was found, upon reflection, to be too open for the Gagne-Briggs model: it allowed for "prerequisite jumping," or to advance to units without completing the prerequisites, and it could not guarantee that every student would be exposed to every area of each unit. The recommendation was to remove the Table of Contents from the Window and have the student progress linearly from "page 1" onwards, and to remove all hyper links within each unit, with no option other than "forward" or "backward" one page at a time (see figure 3.1 for the opening screen on the new Gagne-Briggs application. Figure 3.2 shows the opening screen from the original Gagne-Briggs application). This resulted in a program which was much more rigid, and truer to the Gagne-Briggs idea of planned instruction.

Figure 3.2: Original Gagne-Briggs Program Opening Screen

Thus, the Gagne-Briggs based application was very similar to a linear, printed book, with a few exceptions.
The reader can only progress one page at a time. Several pages can be "flipped through" with a printed book easily: this program allowed the user to progress only one page at a time via a button at the lower right corner of the screen with a mouse click. Additionally, the user can also go backwards, but could do so only one page at a time. This was to ensure that each and every page was at least viewed, even if the student chose to immediately click forward or backward.

The program always starts on page one. Unlike a printed book, which could be opened to any page, this always starts on the very first page for the same reason the pages can only be "turned" one at a time, namely to ensure the student sees each page.

On-line automatic grading quizzes are given to the student between each of the three major units. These quizzes initially consisted of several multiple choice, fill-in-the blank, and drag-and-drop questions; after the evaluation phase only the first type of question remained. A final score of 66% or better is required for the student to progress to the next unit. If this score is not achieved, the CAI unit requires the student to re-read the unit and progress is be prevented until a satisfactory score is achieved.

These mandatory on-line quizzes are instrumental in creating a Gagne-Briggs instructional unit; they assess knowledge gain and elicit performance, allowing progression only when performance is satisfactory.

The hypertext based on the Inquiry model of instruction has a drastically different structure than the Gagne-Briggs CAI unit. It has an inverted tree-like structure with each hyperlink (i.e., each option) leading down a different "branch" of the tree. When necessary, a "twig" hyperlink will
make a connection to another main branch, forming an integrated system. Figure 3.3 shows the hypertext's structure in a conceptual form.

Each line in this figure is a hypertext link which can be followed. Conceptually, from top to the bottom, it looks like an upside down tree with branches extruding in various direction. In addition, there are links between branches where the concepts are related. As an example, Figure 3.4 shows the first screen in the Inquiry based hypertext.

In this figure, the two items at the top of the screen are the first two "branches" which can be chosen. Each of those branches offers their own sub-branches, and those sub-branches may or may not have connecting links among them, depending on their content and concepts.

5. Prepare the concept blocks

At this stage the hypertext "chunks," and the linear units, or chapters, were written. A major limitation at this stage was that the logic of experimental design requires that the information and content displayed in each CAI program be as identical as possible in order to test the effect of different forms of presentation (instructional model). Every effort had to be made that one module did not teach information that was not in the other, in order to make the two units comparable. To accomplish this, the Gagne-Briggs program was written first and the content was then simply "cut-and-pasted" into the Inquiry hypertext.

The Gagne-Briggs CAI unit was written first because it was simpler to write a linear manuscript first and then to remove items section by section for the non-linear
manuscript, the Inquiry hypertext. Using the structure mapped out in step 2, each section of the Gagne-Briggs program was written from the beginning to allow for a smooth linear progression, complete with references to what had been taught earlier in the text, and to what would be taught in subsequent units. Each of the three major units was broken down into two further sub-units (one for chair people, and one for participants), and each of those sub-units was then divided into its component parts which were written one at a time. Appendix A presents the final outline of the Gagne-Briggs instructional program, and Appendix B contains the text of the entire Gagne-Briggs product.

This "chunking" of a linear document served two main purposes: it helps the student to read the material because it is clear where one concept ends and another begins. Secondly, it facilitated the "cut-and-pasting" process into the non-linear hypertext.
To write the Inquiry hypertext while keeping its content as identical to the Gagne-Briggs CAI unit as possible, each Gagne-Briggs "chunk" was exported as a stand-alone "paragraph" (self-contained information piece) into the hypertext. The only text that needed to be changed were references to linearity (e.g., a sentence that may have read, "In the last unit," would be edited, and a link to the relevant information put in its place). In addition, the links among the related concepts which had already been mapped had to be created.

The mandatory on-line quizzes were also imported into the Inquiry based hypertext. However, they were made optional, the quizzes were no longer linked to specific units, although their content remained identical.

Figure 3.5: Hypertext with First Chosen Link
Figure 3.5 shows the window of the Inquiry unit the continuing hypertext links after one of two options ("Participant" vs. "Organizer/Facilitator") has been chosen. The group of links at the bottom left of the screen allow the student to close the book or return the window back to the opening screen, and the three links in the bottom right of the window were the three on-line quizzes, available at any time, regardless of which point in the hypertext the reader is at.

6. Provide Links and Cues to Other Concepts

In Jonassen's original view, at step 6 the location of the various hypertext links would be

Figure 3.6: Gagne-Briggs Program with Pop-Up Citation

Meeting Material

The very first thing to be discussed at that meeting, if there is no sense in calling a meeting at all, Rochelle O'Connor (1980) has cited several reasons for calling meetings.

1. Meetings bring people together to furnish them with information, to have them work together to accomplish some task, and, frequently, to motivate them.
2. Meetings extend the group's thinking horizon and purview with respect to potentially critical issues.
3. Meetings have become the major communications medium in the company for keeping the operating managers apprised of what the company's goals are and their role in achieving them, and in advising top management on what they can expect from the company's various businesses in the future.

Help Quit

determined. In the Gagne-Briggs modelled CAI unit constructed here the only links necessary on each page are the two which lead to the previous and next pages.
respectively. Additionally, there are “pop-up” windows on some pages which, when the mouse-cursor is passed over the highlighted word, a small window with bibliographic information is shown (Figure 3.6 shows a typical Gagne-Briggs application page with a pop-up window). These pop-up windows show only the complete citations so that the viewer can follow-up after the program is finished; they do not contain additional material, and they disappear as soon as the mouse-cursor is moved away from the highlighted word.

The links and cues in the Inquiry based hypertext were much more involved and required much more interaction with the reader. When the readers first begin this hypertext, they are presented with links to various sub-branches with the title of each branch as a cue. As an example, the first screen offers the option to the reader to pursue information relating to a meeting organizer or regular participant, as well as options to write one of the quizzes (Figure 3.4). As choices are made, other sub-branch titles are displayed as optional links for the reader to traverse (Figure 3.5). Choosing one of the links that lead to an “information chunk” opens another window with the information itself. It, in turn, contains links to related concepts as needed. Figure 3.7 shows a full-screen image of the hypertext in use: the window in the foreground is the window containing the information to be taught and the big window in the background is the originating window for the link. The foreground window has several highlighted words which are hyper links to other pieces of relevant information, which in turn contain links to a third, then a fourth window if necessary. Each window can be removed with a simple mouse click. As each window is closed, the reader travels back toward the main branch of
Dealing with Baggage

Baggage is people's "ideas, beliefs, hang-ups, desires, tragedies, hopes, fears, and so on," and this baggage may interfere with the going-ons of a meeting in a rather innocent manner. Baggage, however, and the failure to deal with it may lead to far more catastrophic results than the other example given (imagine one person's Beliefs clashing with another person's Hang-ups and it isn't hard to see how many topics can lead to angry arguments). Before a meeting truly progresses, it is useful, and in some instances necessary, to deal with the participants baggage to get it out in the open before any potential problems have the opportunity to surface.

Exercise - Identifying Group Baggage
Exercise - Identifying Strongly Held Beliefs

The program until the opening screen is again reached, and any of the numerous other branches can be travelled.

Each of the hyper links in these opened windows are terms or phrases which signal to the reader that more information can be read on that topic, at the reader's option. Additionally, the Inquiry based hypertext also has smaller pop-up windows with citation information identical to those in the Gagne-Briggs CAI program.

7. Debug the System

Although Jonassen suggested this last step needed to involve mainly proofreading the "chunks" and making sure all the links work, this step was taken much farther in this project. Several "waves" of assistants read through and examined each program, and
changes and edits were made following their suggestions, reactions, and problems discovered in the process.

The first group of volunteers was the committee overseeing this project; next, there were graduate and undergraduate students from Communication Studies and Business Administration, all of whom had academic training related in some way to this project (some from message design, and others from small group communication); and finally a professional from Computing Services agreed to assist who routinely uses computer-based applications and participated in meetings. As a result of the feedback offered, steps 5 and 6 were repeatedly re-done until both CAI programs were polished and ready to be used in their respective settings.
One of the first changes involved the question format in the on-line quizzes. Initially, there were three forms of questions: multiple choice, fill-in-the blank, and drag-and-drop terms to match definitions. The multiple choice questions required only a single mouse-click to enter, but the remaining two forms of questions required substantially more work.

The fill-in-the-blank questions were deemed not intuitive, and the software allowed no spelling errors (including capitals or numerals in the responses). The entire CAI program was based on the Microsoft Windows operating system which uses the option of an “ALT-TAB” keystroke to advance certain features, like a dialogue box to be filled in, as in the fill-in-the-blank question. The fill-in-the-blank questions, however, did not support this keystroke shortcut, but rather required the cursor to be placed in the to be completed dialogue box, using positioning of the mouse and a mouse click. Having to switch repeatedly between using the mouse and the keyboard on the same question was deemed inappropriate and counter-productive to learning. In addition, the answers had to match exactly those programmed as correct. The digit “5” as well as the word “five” were evaluated as wrong if the correct answer was programmed as “Five.” These questions were removed or re-written into new multiple choice questions.

The drag-and-drop questions required a sufficiently dexterous user, as the term which was “dragged” by the mouse needed to be placed exactly in location with little room for error; otherwise the question was marked as false, even if the answer was correct. Many users did not know how to use the mouse on these questions, and the quiz tested mouse facility as much as content master. These questions were also removed or
rewritten into multiple choice questions. Figure 3.8 shows an example of correctly and incorrectly placed "drag and drop" questions.

A further problem arose from monitors with low resolution. The Inquiry based hypertext and the Gagne-Briggs based CAI unit had both been designed on a computer with a monitor set to a resolution of 800 by 600. Many of the computers during the testing process were in lab facilities with monitors set to a resolution of only 640 by 480. Consequently, some windows which "cut off" on the edge of the screen (see figure 3.9 for an example of a window on the monitor with an 800 by 600 resolution. Figure 3.10 shows the same windows cut-off the edge of a monitor at a resolution of 640 by 480.). More experienced users knew that the windows could be repositioned on the screen, but less experienced users thought the hidden part of the window contained information that wasn't meant to be seen. The hypertext module was edited to be properly legible from any
screen resolution.

The Completed Programs

After each program had proceeded through Jonassen’s 7 steps for the creation of hypertext, we examined each program against its respective instructional theory to determine if the modules still followed their basic theoretical tenets.

Gagne-Briggs CAI Module

To assess whether the Gagne-Briggs module is truly based on the Gagne-Briggs theory of instruction, it needs to be examined against the 9 instructional requirements put forward by the theory. These instructional events are as follows.

1. Gain the learners attention.
2. Inform the learner of the objective.
4. Present the stimulus material.
5. Provide learning guidance.
7. Provide feedback about performance correctness.
8. Assess the performance.
9. Enhance retention and transfer of knowledge.

_Gaining Attention._ The first aspect of instruction as prescribed by the Gagne-Briggs theory is to somehow gain the learner’s attention. Originally, it was assumed that the student’s attention would have already been gained by the simple act of starting the program: If the student was reading through the program, then attention could be assumed. However, students may read material simply because they are told to; consequently, a new “splash screen” was added to the program at the very beginning. This screen is intended to entice the student to look at the monitor by playing “fancy music” and showing a “fancy graphic.” Additionally, sharp sounds were introduced between units to keep the learner’s attention from drifting.

_Informing the Learner of the Objective._ The introductory material in the program informs the learner of the overall goals of the program, and what the student could expect to learn from the material. Each unit begins with an explanation of what is to be taught in that unit.

_Stimulating Recall of Prerequisite Material._ This was a difficult aspect to incorporate because the “instructor” (the computer program) has no way of knowing what the learner already knows. Instead, the program can only assume that the student has certain knowledge. However, the second and third units begin with a short recap of what was already learned in the previous unit to help prepare the student for what is to come.

_Presenting the Stimulus Material._ The stimulus material consists of all the information
contained within each unit. Appendix A contains an outline of the Gagne-Briggs module, and Appendix B contains the entire text of that module. The content is summarized below.

1. Before a Meeting

- how to arrange meeting material
- information about venues
- "task requirements" for those who organize meetings
- how to set up an agenda
- uses of guest speakers
- material with which to do background research
- how to handle written reports
- tips for mental preparation

The information and knowledge that was determined to be required before a meeting begins includes an organizer’s ability to properly write up an agenda with relevant and useful material; this includes having a set goal which can easily be examined after the meeting as whether or not it had been met. The organizer is also responsible for supplying the participants and guest speakers with all the information about the meeting they will need, and must also find and book a venue in which to hold the meeting. The participants, meanwhile must conduct any required background research, as well as compile any written and verbal reports they may have.

2. During a Meeting

- how to open a meeting
- how to speak effectively, as both a chair and regular participant
- effective mediating
- idea generating techniques
- preparing your mind for the meeting, as a group
- how to present reports
- effective listening
- how to ask useful questions

In this categorization of required information we find information and pointers on effective meeting communication, including speaking, asking questions, and listening. The most prominent aspect of this category, however, are "Idea Generating Techniques."
3. After a Meeting

- ensuring action
- evaluating the meeting

This section of information contains the smallest amount of information, but the content is crucial: how to evaluate the effectiveness of a meeting.

*Eliciting the Performance.* This was also a difficult step to incorporate in a computerized instructional aid as the step calls for determining if the student actually acquires the intended knowledge. (Aronson and Briggs, p. 92) The computer cannot really tell if the person at the keyboard understands what is being taught. In an attempt to make-up for the loss of this human intuitiveness, examples and exercises were given frequently throughout the units in the hopes that the student follows them and completes the exercises. (Figure 3.11 shows 2 exercises from the program)

*Providing Feedback about Performance Correctness.* The students are asked to complete a number of exercises with no feedback. To test actual performance, on-line quizzes were made mandatory between units. Each question on these quizzes is evaluated as correct or incorrect and the result is tallied as the quiz is being completed. If the student does not perform at a satisfactory level (in this case, a score of 66% or better), he or she is

![Figure 3.11: Multiple Choice Questions](image-url)
required to re-read the unit and take the quiz again. This is the sole form of feedback about knowledge gain that is possible using such a method of instruction (and given limited resources).

Assessing the Performance. “The purpose of this event is to determine if the learner obtained the objective and can consistently perform what was intended.” (Aronson and Briggs, p. 92) The CAI program cannot perform this step on its own: the on-line quizzes implemented within the programs can only tell the user how many questions he or she got correct (which is an assumption of gained knowledge.). To supplement this, a post-program written evaluation was constructed; it consists of several multiple-choice questions, some true/false questions, and some open-ended scenarios for the student to complete (a copy of this evaluation can be found in Appendix C). These evaluations are optional, need to be administered by a human supervisor, and are distributed along with each CAI program. In this way, performance can be assessed beyond the quizzes within the units.

Enhance Retention and Transfer. “Instructional designers cannot assume that learners will be able to transfer learning from one situation to another; such retention and transfer should be included as part of the instruction. For intellectual skills, providing spaced reviews helps.” (Aronson and Briggs, p. 92) The subject of small-group meetings falls into the group of “Intellectual Skills” because it involves both rules (“a relation between two or more concepts”) and problem solving (“using two or more previously learned rules to answer a question about an unfamiliar situation”).(Petry, Mouton, and Reigeluth, pp. 14-15) This step in the Gagne-Briggs instructional sequence has been implemented
throughout the unit in the summaries and reminders of what has been learned and what is to be learned. Additionally, the on-line quizzes can also be considered a source of knowledge retention.

The Inquiry Hypertext

The Inquiry theory of instruction, being more of a discovery based form of instruction, does not contain as explicit a guideline for examining instructional units as the Gagne-Briggs theory of instruction. Assessing the final hypertext module against the standard required for the Inquiry theory is therefore a more complex endeavour.

This hypertext does not readily conform to any of the 10 strategies that Inquiry instructors can use (as explained in Chapter Two.). However, this may be due to the restrictions imposed on the project by its nature as a thesis project; it would be possible to construct a hypertext that includes several of the 10 strategies. As this hypertext does not use the strategies, another form of standard must be used to assess whether this hypertext qualifies as Inquiry-based.

“Inquiry instruction has three component parts. 1) the goals of the teacher; 2) the strategies the teachers use; and, 3) the control structure governing their teaching.” (Collins and Stevens, 1983, p. 257) Although this hypertext does not use the 10 strategies listed for component two, it does meet the requirements of the other two components. The goal of the instruction in the hypertext are to teach the readers the elements of a meeting and to teach them to use these elements critically in new ways. These goals coincide with the general Inquiry goals of teaching students particular rules or theories and how to derive them.
The third component is itself comprised of three parts: selecting cases with respect to desired outcomes choosing a dialogue model which is unique for a student, and fixing "bugs," or catch-up learning, as needed. The hypertext meets all three of these: The cases and examples selected for the hypertext were chosen to clarify and help explain those areas deemed important. If an example wasn't needed to achieve the desired outcomes, it was not included in the final text.

With respect to an instructional model unique for each student, the case of hypertext is interesting, for it is the student who makes each hypertext unique through choosing his or her own path. The Inquiry model of instruction stipulates that the instructor, through a series of questions with the student, learns what the student needs and forms a model of dialogue around that. In the case of CAI the student forms the dialogue with the hypertext, according to his or her needs.

The third portion of the dialogue component tells us that as the instructor learns more about the student's current body of knowledge, the instructor will find certain "bugs," or pieces of knowledge not known by the student, that need to be corrected before instruction can continue. The series of hyper links in a hypertext fills this need. As students run across information and knowledge with which they are not familiar, a hyperlink can be travelled, provided it exists, and the missing information can be obtained. Thus, in a general way, this hypertext does fall within the bounds of the Inquiry model of instruction. However, a large component of the 10 instructional strategies of the theory has been excluded and it can only be concluded that the hypertext is therefore
missing an important aspect of the theory which has the potential to make this a better instructional aid.

The Programs as Instructional Tools

Two CAI programs were produced for two different situations: the Gagne-Briggs program is intended to be used in a classroom setting as part of a course, while the Inquiry hypertext is intended to be used in a training setting, perhaps to assist in upgrading skills. Teaching and training situations, respectively, have different methods of instruction, different forms of instruction, and different goals as to what information needs to be taught.

The most prominent characteristic of classroom-based learning is that it is command learning. That is, students are told by the instructor what is important and what is to be learned in the material. Students are also generally given a time-frame within which to complete each unit of study and at the end of that time are given an examination to determine how well they have learned the material.

The CAI program based on the Gagne-Briggs theory of instruction is useful for instruction that requires an understanding of all the material. First, it implements command learning. This program does not allow the learner to learn what he or she would like; instead, it tells the learner what is going to be learned, and will not allow progression until what is supposed to be learned has been learned. Secondly, it uses a form of teaching familiar to students: it instructs them, and then examines them at regular intervals. A pillar of classroom instruction is that examinations occur to inform both the instructor and the student how well the student is mastering the material: this program follows that
logic. Finally, the program instructs in a linear format, as later material builds upon and expands earlier material. In essence, the Gagne-Briggs CAI program instructs in a method familiar to students; it completely covers all of the material being taught.

The Inquiry-based hypertext, on the other hand, is designed as a training tool, as opposed to an instructional tool. Unlike the Gagne-Briggs package, this hypertext is not linear, does not have regular interval examinations, and does not require that the learner be exposed to all the material. The hypertext would be useful for training because learners in a training situation often do not need to cover all the material if they are already partly familiar with it, nor do they want, or need, to be examined on the material they do learn.

A training situation focuses on the learner needing or wanting to learn, or to refresh knowledge in, a few select areas. Using the material constructed for this project for an example, an employee of a small organization may be an active participant in several meetings a week but may not know how to make his points effectively. He has also noticed that he easily dismisses the ideas presented by others. He would like to learn how to speak, and listen effectively in meetings.

He can obtain information of interest to him from the Inquiry-based program through the following steps. The opening screen, as seen in Figure 3.4 above, offers the learner several options for more information. The learner may decide that he doesn't want to take one of the three quizzes, nor does he need help on how to use a hypertext or understand what a hypertext is because he has used this type of technology before. This leaves him two options: Information for a Participant, and Information for a Meeting Organizer. As he is a regular meeting participant, he chooses that branch. When he
chooses the appropriate link, the screen changes again to offer yet more options: information Before a Meeting, information During a Meeting, and information After a Meeting (see Figure 3.5). His problems (how to speak and how to listen more effectively) both fall during a meeting, so he chooses that link and can choose from a variety of sub-branches including Speaking and Listening. He has found the information he needs, and follows these links (see Figure 3.12).

After reading through all the information he needs and going through the examples and exercises offered, the learner quits the program and hopefully puts his newly gained knowledge to work in the next meeting he attends.

It is possible that while reading this hypertext, the learner comes across some information pertaining to questions through which he browses out of curiosity as to what

Figure 3.12: Hypertext with Available Sub-Branches
it says. In turn he may follow another link leading to reports. If he wants to brush up on
his understanding of this area, he takes this link and reads it thoroughly before quitting
the program.

It is entirely possible that another person could choose links in the exact opposite
manner (e.g., Reports → Questions → Speaking → Listening, or any other order) and yet
be exposed to all the same information, due to the way a non-linear hypertext works.

During the “pre-testing” by the volunteers, it became apparent that there were
other, unanticipated, paths through the non-linear hypertext: several volunteers read
through it as if it were a linear text, while one first read through the quizzes, and then
searched through the hypertext for the answers to the quiz-questions.

The students who read through the hypertext linearly did so in very precise
fashion. First, they chose the first main branch offered in Figure 3.4, then they chose the
first sub-branch after that, then routinely read through all the options presented one-by-
one, including all of the links among them. They encountered the same information two
or three times as links looped back to branches already read. When asked about this
behaviour, the volunteers replied that they did not want to miss any of the information.
Used to linear thinking, they did not expect to encounter identical material more than
once.

The other student who read the quizzes first wanted to find out what was
considered important by the text; he expected that the quiz-questions would provide a
good idea of what to focus on in reading the text. After seeing all the questions, he
searched through the hypertext for the answers and, not surprisingly, finished far quicker
than the other volunteers. The others, who said that they “did not know [they] were allowed to read the quizzes first.” would have done the same if they had known, but they stayed within the conventions of traditional teaching methodology.

Thus, the students were acting as they knew best in an instructional situation: they were reading all the material and preparing for an (unknown) examination afterwards. They were doing what they have been instructed to do through years of schooling. They did not take advantage of the opportunities of a hypertext: they used the hypertext as they would have used a traditional text: linearly.

The lone student did what many students desire to have happen: he found out what he needed to know to pass the test, and learned that and no more. He did not want to read material which would be extraneous toward his goal of passing. The other students echoed this desire when they said if they had known they were allowed to read the quizzes first, they would have.

Jonassen’s outline worked well in the construction of both of these CAI units: that they were used in unforeseen ways is a variable that was not a fault of Jonassen’s outline, nor was it a fault of the Inquiry instruction theory which presupposes that the learner has an idea of what to learn. Rather, it is more likely the result of an education system geared towards a Gagne-Briggs mode of instruction.
Chapter Four - Discussion
Summary of Thesis

This thesis described the construction of two Computer-assisted Instruction tools using the multimedia authoring program *Asymetrix Toolbook*. Each CAI program used a different instructional theory as a framework for its construction: the Gagne-Briggs theory of instruction for one module, and the Inquiry method of instruction for the other. These theories were chosen because they can be considered “opposites,” and because each of them is useful for different situations: the Gagne-Briggs theory for classroom instruction, and the Inquiry method for training. As a result, the two programs require different interfaces.

The construction of each program followed Jonassen’s (1987) steps for the creation of hypertexts. These steps involved gathering the material, outlining (or storyboarding) the product, and connecting the links among the various pieces of information. The two programs were tested by volunteers for general flow and understandability, and the two final products were examined against their base-theories to make sure they retained their instructional foundations.

Field Experience

The most important observation made during the testing by student volunteers was that students generally do not understand non-linear thinking. When given a hypertext which allowed them to read the material in any way they desired, most of them attempted (and succeeded) to make the non-linear aspects as linear as possible. The sole exception was one student who began – “out of sequence” – with the exams to find out “what he needed
to know.” There is one explanation for this behaviour, namely that students generally do not know how to use non-linear forms of instruction, because they are not accustomed to them - or they prefer linear learning because they achieved success with it.

Beginning in pre-school, students are schooled in command instruction, which has become habitual to them. They are used to being told what to learn and, when given an opportunity to learn as they wish, they do not know how. Hence, to better understand how to use hypertext, or any non-linear form of instruction, effectively, students need to be taught how to learn in such a manner. Ironically, it would seem the best way to teach students how to break free from the linear way of thinking, is to use a command-like Gagne-Briggs form of instruction. However, more research in this area is needed before such a claim could be made with authority.

The one student who “broke the rules” was an exception to the rule. Using the assumption that only the important parts of the material would show up on the quizzes, he read the quizzes first to determine what was important, then searched through the material to find the answers to the questions. Confirming work dealing with hypertext browsing, this volunteer was the first to finish: he knew exactly what he was looking for, and since hypertext is an excellent search and retrieve tool, he was able to accomplish his task quickly.

This student can be used as an illustration of hypertext use in training situations. In a training situation, trainees will be looking for specific information, as opposed to all of the information available, and will not want to wade through extraneous information, because they look for efficient methods. This student did exactly that: he searched for
specific information, much like a trainee would, without browsing through a lot of extra material for each piece of information. He was the quickest to finish, and his quiz results indicated that he was just as successful as the others in retaining and understanding the information.

The students who had read the hypertext linearly said that if they knew they were allowed to read the quizzes first, they would have done so in order to get an indication of what was important, and would have then searched out that information. This hints at two conclusions: one, the hypothesis that students have a schema of command learning is supported: they understood it was possible to read hypertext differently, but they did not do so because “they were not allowed.” Secondly, there may be an inherent understanding that hypertext is a useful search tool since all of the students who used it said that if they knew they could read the quizzes first (i.e., if they knew what to look for first) they would have done so to search for the specific information required. This hypothesis would go far in explaining hypertext’s appeal, but more research in this area is also needed.

Those who read the Gagne-Briggs program found it useful, but long. It took students between two and three hours to complete. Although they all felt the program was extremely beneficial in instructing them about a large number of meeting topics, they also felt bogged down with the length. This feeling of “never-endingness” was doubled for the few who were required to re-read an entire section because they failed a quiz. In the words of one volunteer, “I only got four questions wrong, yet I needed to read all of the material again. It got boring, and I forgot what I was supposed to look for.” It did, however, result in near-perfect scores the second time the quizzes were taken.
Changes in Future Versions

It cannot be emphasized enough that the volunteers in this thesis were all students: for this “pre-beta” test no managers or professionals in the workplace were given the same opportunity to read the programs and provide feedback as students were. As a result, the feedback that was provided was obviously biased towards the view of the students. However, this is enough to provide some ideas of how future versions of these programs should be changed.

The first change to be made involves the Inquiry hypertext and its current “textbook” like interface. At the beginning of this thesis project it was assumed that a computerized hypertext had enough differences “a priori,” per se, from a printed text that the only effort required to make it unique and beneficial was to follow Jonassen’s seven hypertext creating steps. The simple fact is, however, that even a printed book can be read non-linearly, like a hypertext. In fact, most professionals do not read a book from beginning to end, but instead read only the parts they feel is necessary. Likewise, when students conduct their own research projects, they also search for only the relevant sections of a book and bypass the rest: it is only when they are instructed to do so will they read an entire text from beginning to end. The volunteer students in this project believed they were required to read all the material - the one exception came from the student who believed he was only required to read the material for what he was expected to know. So, surprisingly, it may be that the Inquiry-based hypertext is more “text like” than the linear Gagne-Briggs program! In the future, effort should be taken not to
compare either of these programs to a printed book, but to instead focus on what would make both of these programs the best they can be while keeping their goals in focus.

If the goal of the Gagne-Briggs program is to be used to instruct a learner in all the aspects of a meeting, much like a lecture or series of lectures, then few changes to the overall construction of the program need to be made: it is sufficient to require the learner to progress one screen at a time. However, if the goal is also to teach the learner the actual practice of a meeting, in addition to the theory of a meeting, then actual video-clip examples of meetings in progress should also be given. Meetings in practice do involve interaction with people, and this program as it stands does not readily portray that.

The second change to be made to this program involves the on-line quizzes, and the Gagne-Briggs tenet of immediate feedback. Currently, the program tallies the score of an entire quiz and, based on that score, either requires the learner to re-read the entire section or allows the learner to progress to the next one. This does not allow the learner to easily find the information to assist him or her in understanding what is not known. Instead, as soon as a quiz question is answered incorrectly, the learner should be taken immediately to the area of the section which contains the needed information. As soon as that particular area is re-read, the learner should be allowed to return to the on-line quiz and pick up where the quiz was left off.

The next version of the Inquiry hypertext requires both more numerous and more refined additions and editions, beginning with a more focused understanding of how the hypertext will be used. The hypertext constructed for this thesis had an envisioned use of being used by individuals either at home alone or alone in the workplace. The hypertext
was intended as both a cross between a reference system where the user could quickly find certain desired information in a hurry, and a training system where the user could learn about all aspects of a small group meeting. Currently, the hypertext provides a good method for a learner to quickly search and retrieve specific information, but is less effective at providing overall training, leaving the hypertext as a terrific reference tool, but a less than terrific training tool, and this is due to the nature of attempting to combine the two goals. It is possible for the hypertext to be both a training program and reference tool, but several important changes need to be made.

To remain a reference program, a new search aspect needs to be added: the user should be allowed the option to type in exactly what he or she is looking for, and a window with a list of all the possible links in the hypertext which lead to relevant information would then be provided. The Microsoft Windows “help” system already offers this capability, and it provides a quick means of getting directly to the needed information other than following through a series of links.

To remain a training program, however, the expected final use of the program needs to be clarified. Is the program to be used alone in an office, or is it to be used as part of a mass training program, similar to a classroom setting? If the latter is the case, then it is likely that a CAI program would not be needed at all: printed pamphlets, personal interaction, and roleplaying would be more efficient. If it is to be used singly, a further question needs to be answered to assist in providing awareness of more editions to the current program: why would anyone want to use this hypertext program over a printed book? People read books non-linearly all the time. It is arguable that story-telling novels
are the only books read completely from beginning to end, so a hypertext offers little
difference in what is already available. Additionally, to use a CAI application, the person
needs to be at least slightly "computer literate" and must follow many more steps to
activate the program than it takes to open a book. Some form of advantage to the CAI
program must be given, and this advantage stems from a computer's ability to provide
multimedia enhancements.

Just as the suggestion for change in the Gagne-Briggs program involved adding
video clips of actual meetings, so should the Inquiry hypertext have video and audio clips
added: this is the area where a printed book cannot match CAI. A meeting has human
elements in it, and video clips offer visual examples of theory in practice whereas the text
offers only example of theory. With added video clips, the hypertext becomes more useful
than a book.

The on-line quizzes should also be changed in ways similar to the quizzes in the
Gagne-Briggs product, with one difference. In the Inquiry hypertext, if a quiz question is
answered wrong, the user is allowed the option by a new pop-up window of reading
relevant information about the question. The Inquiry theory does not demand that a user
immediately cover the material again, but the option should be given.

Finally, instructions on how to use the hypertext should be provided in a small
written manual distributed with the program: it can be assumed that a manager or a
professional in the workplace can read, but it cannot be assumed that they know how to
use hypertext. Hence, to provide hypertext instructions in hypertext form is self-
defeating: this information needs to be provided in an accessible form to the end user.
Asymetrix Toolbook as an Instructional Device

One of the aims of this thesis was to examine the usefulness of Asymetrix Toolbook as an instructional program. With its ability to allow interactivity on the part of the reader and its ability to offer either a flexible, open interface like a hypertext, or a strictly linear one, Asymetrix Toolbook seems worthy of future use. The true potential of this authoring program was not fully explored in this project. Toolbook offers the use of multimedia video clips and user responses on more than just a multiple-choice question level: open ended answers could be typed directly into the application, saved for a later date, and even printed on a printer for other uses. As an instructional application, Toolbook has great potential.

In the simplest way, Asymetrix Toolbook served as a tool for implementing a Gagne-Briggs teaching device. It could, however, do so in other ways than by offering an electronic version of a book. Here is an example, using the small group meeting material taught in this thesis’ project as a guide.

The basic outline of the new Gagne-Briggs instructional program would remain the same: it would consist of three major chapters, each of which is divided into two sub-units (Before the Meeting: Organizer, Before the Meeting: Participant, During the Meeting: Organizer, etc.). Each chapter and sub-unit would begin by informing the learner of what he or she was expected to know by the end of that unit in precise detail. However, each unit itself would then be constructed in an Inquiry theory format, with the learner able to take any “route” through it desired to search for all the required information. When the learner feels that he or she has learned all the requisite material, a
quiz would be taken to gauge the person's understanding of the material, and a pre-programmed decision based on the learner's quiz score would determine if the learner would be allowed to advance or not. If the learner advances, the next unit would begin by stimulating recall of the previous units, and the cycle would begin again. A program such as this would continue to enforce the strict rigidity of a Gagne-Briggs program, but would also make use of the advantages offered by a non-linear hypertext.

The cost/benefit question also deserves some examination, as the time required to produce an Asymetrix Toolbook instructional unit, as with any other multimedia authoring program, involves hundreds of man-hours. In order for the time requirements to be worthwhile, the unit produced would need to be used by a large number of people, either in the same organization or in many. Although these units are not intended to make money, an economic analogy can be drawn: a company would not hire a person to produce any multimedia program if the economy-of-scale did not let them believe they would recover their costs; enough people would need to buy the program to make the time and money invested worthwhile. The same can be said of these units: enough people would need to use them to make the time invested useful. This need not equal a ratio of one hour of use to one hour of production, but enough people must gain enough benefits so that the producer(s) feel satisfied to the extent that an update, if needed, would not be a "waste of time."
Further Research

Learning and training are two different ideas which require different forms of instruction. A learner in the workplace has different expectations and demands than a school-based learner, one of which is, as an example, that a learner in the workplace would most likely not want to be examined on a pass and fail basis on the material he or she is expected to know: instead, they just want to be taught the material they are expected to know so they can use it. A learner in a school, however, needs to be graded to allow a comparison to judge who is advancing and who is not.

Research on this particular project has a logical next step: the application of these two programs in learning and training situations. This step would serve as an even more appropriate evaluation of these programs and, if conducted properly, could also test the hypothesis just stated that students need to be graded while workplace “trainees” do not. If four groups are used (two groups of students, and two groups of “professionals.”) with each group given a particular program so they are shared evenly (i.e., one student group would have the Gagne-Briggs program and the other student group would have the Inquiry program. The same division would be made with the professionals), a proper comparison could be made. To assist in examining these results, we turn to Starr Roxanne Hiltz.

Starr Roxanne Hiltz (1993), in her 1993 examination of a “virtual classroom,” suggested four criteria for judging a Computer-mediated Communication device as applied in learning situations. These same variables can be used to judge the “success” of the programs constructed here. (Hiltz, p. 76)
1. The amount of *use* of the system.
2. The *subjective satisfaction* of the learner from using the system.
3. The *benefits* to the learner of using the system.
4. The amount of *learning*, or "mastery" of the material, from using the system. (Hiltz, p. 76)

As these variables are used to judge the success of the program in teaching, they need to be differentiated from those which judge the program as successfully based from an instructional theory. Instead, Hiltz's variables are meant to evaluate the ability of the programme to instruct learners in a meaningful and satisfactory way. It is the job of the instructional theory to provide a basis for the instructional program, but it is the job of the program to do the actual instruction. The latter aspect is examined by Hiltz's four variables.

Additionally, Donald Kirkpatrick offers four variables with which to examine a training program.

1. the feelings the students have about the program;
2. the degree to which they learned the required material;
3. their ability to transfer training to the work site, and;
4. the impact of training on the organization's bottom line. (Kirkpatrick, 1959)

These four variables, combined with those put forth by Hiltz, would provide an excellent method of examining any CAI training program.

Finally, a full evaluation of these programs would necessitate a full log of the paths taken in the hypertext, and a log of which quiz questions were answered correct in both programs. Variables which display to the program developer the exact amount of time taken on each section in both programs and on each unit in the Gagne-Briggs based program would also be needed. This information would all be used to assist in guiding the
developer in making future editions to the programs to improve their instructional abilities.

Both of the instruction theories used in this thesis, the Gagne-Briggs theory and the Inquiry theory, are useful in the creation of Computer-assisted Instruction programs for specific purposes. However, it must be understood by the developer of these programs that students generally think in a linear method and are unaccustomed to instruction which does not support this form of thinking. To expect a student to be able to use a non-linear hypertext with no instruction on its benefits and how to use it effectively is faulty thinking. However, given the benefits of hypertext as a search and retrieve tool, this is an obstacle which must be overcome for students to efficiently be able to browse through the large amount of information currently available to them.
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Appendix One

Outline of the Gagne-Briggs CAI.

1. Unit I
   a. Organizers
      i. Meeting Material
      ii. Venue
      iii. Task Requirements
      iv. Participants and Guest Speakers
      v. Agenda
      vi. Notes on Why Meetings Fail
      vii. Traps During Planning and Preparation
   b. Participants
      i. Background Research
      ii. Reports
      iii. Baggage

2. Unit II
   a. Organizers
      i. Opening a Meeting
      ii. Dealing with Baggage
      iii. Speaking
      iv. Mediating
      v. Idea Generating Techniques
      vi. Concluding the Meeting
      vii. Notes on Why Meetings Fail
      viii. Notes on Effective Facilitating
      ix. Traps During the Meeting
   b. Participants
      i. Listening
      ii. Speaking
      iii. Giving Reports
      iv. Questions
      v. A Quick List: Effective Meeting Communication
      vi. The Effective Participant: Notes

3. Unit III
   a. Ensure Action
   b. Evaluations
Appendix Two: Unit Content

Introduction

Meetings are a phenomenon that, enjoyable or not, anyone who is a member of a group needs to go through. These meetings need not be large, corporate seminars convened for the purpose of some corporate takeover or another. In fact, most meetings that exist do so on a much smaller scale, and vary in degrees of formality from "coat and tie" formal to very informal in a persons home. Similarly, meetings can range in size from gatherings of large numbers to get-togethers of a few.

This program is concerned with the latter, smaller, less formal types of meetings. This hypertext is for you if you meet the following criteria:

✔ You attend at least semi-regular meetings.
✔ These meetings are small in size (5-15 people).
✔ You either participate or organize these meetings.
✔ These meetings are used to generate ideas or solve problems.

If these statements sound like they apply to you and your meetings, then this package will be useful in improving your performance, input, and productivity, in meetings and, as a result, improve the final results of the meetings as a whole.

This program will take you through the steps of a meeting, from before the meeting starts, to after it ends. It will explain each step to you and its importance in the overall goal of meeting productivity and give examples where needed. The unit is divided into three smaller units (Before the Meeting, During the Meetings, and After the Meeting) with some additional information at the end.

Each unit will be self-contained, in that each unit could be read on its own, although this it is recommended you do read each in order. The units will begin with an explanation of what is to come, examples of what is being taught, and each until will end with a quick review of what you have learned.

Unit 1 - Before the Meeting

A meeting cannot, or should not, be held, called, or exist, without a reason to be held, called, or exist. As an organizer, or chairperson, of a meeting committee, it is your responsibility to organize the reasons for that meeting. Other responsibilities an organizer faces before the meeting include obtaining a venue, setting a time slot, printing and distributing related material, and briefing any guest speakers there may be. As a participant, you are responsible for reading any printed material the organizer may have distributed to you, preparing any possible reports, and performing any other background research that may be necessary.

Organizers

Organizers, or chairs, or meeting heads (whatever their title may be) must by necessity bear the brunt of organization, of course, and of meeting preparation as well. In this section, you will learn about the following topics.

✔ Arranging Meeting Material
✔ Notes about a Venue
✔ Task Requirements

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Meeting Material

The very first thing to be decided by an organizer for a meeting is what will be discussed at that meeting. If there is no material to be discussed at a meeting, then there is no sense in calling a meeting at all. Rochelle O'Conner (1980) has cited several reasons for calling meetings.

- Meetings bring people together to furnish them with information, to have them work together to accomplish some task, and, frequently, to motivate them.
- Meetings extend the group's thinking horizon and purview with respect to potentially critical issues.
- Meetings have become the major communications medium in the company for keeping the operating managers apprised of what the company's goals are and their role in achieving them, and in advising top management on what they can expect from the company's various businesses in the future.

To re-word that very bluntly, meetings are an avenue in which communication can be dispersed concerning the company's goals, in which "lower level" employees can contribute insights and suggestions, and in which problems can be presented and ideas generated to solve them. As this text is concerned mostly with the latter two ideas (contributing insights and idea generating), we will focus Meeting Material with those topics in mind.

In order to understand the idea subject matter for your meeting, it is first necessary to define the problem and find if a meeting topic really exists. Schindler-Rainman and Lippert pose a question that organizers of meetings should ask concerning meeting topics: "What are possible purposes/outcomes of the meeting that would actualize the needs and expectations of the participants and the planners?" (Schindler-Rainman and Lippert, p. 21)

Example

Zacharey, the head of a small group of eight, is given the task of determining why students are apathetic concerning student voting and general student political life. So, he asks himself the question of what the next meeting should result in, and tries to be as specific as possible. He answers first with, "Why are students apathetic in politics?" Realizing that this is a generally broad question, he narrows it down to "What are the underlying reasons that students care so little for campus politics, and are there ways of convincing them that they should get involved?"

Feeling that this is also what the other participants will expect from this meeting, Zacharey proceeds with this Meeting Topic as his goal, and continues planning.

Asking one question, however, to clarify an issue has the potential of leaving other concerns unnoticed (it's like looking at only one side of an issue in an attempt to gain an objective view). Another method has been constructed, however, that will help you further clarify a meeting topic.

Jorgensen, Scherer, and Fautsko (1981) have designed a model entitled the "RISK Acronym," which consists of a series of questions to ask yourself, to assist in further defining this meeting topic.

The RISK Acronym

Reality -- Is it really the question, or even a question?
Importance — Is it an important question?
Specificity — Is the question specific enough?
Knowledge — Does the target group potentially have the knowledge to deal with the question?

To continue our example, Zacharey's meeting topic, as he decided, was "What are the underlying reasons that students care so little for campus politics, and are there ways of convincing them that they should get involved?" He runs this meeting topic question through the RISK Acronym, one question at a time.

- *Is it really a question?*

Yes, it is, as it has the ability to be answered.

- *Is it an important question?*

To this group, yes it is, as they have been charged with this particular topic. If the group was designed with the intent of studying the University's bylaws, then the question may not be important or worthy.

- *Is the question specific enough?*

Yes. In the previous step, Zacharey had narrowed down the question as much as he felt he could. Merely asking, "Why are students apathetic in politics?" is far too broad.

- *Does the target group potentially have the knowledge to deal with the question?*

In this instance, yes. This is only a concern when the group that meets discusses a wide array of questions that they may not have a specialty in.

**Venue**

An organizer should, at the earliest possible time, obtain a venue for the meeting. In the case of our example, obtaining a venue is probably not a concern. However, in instances where there will be presentations, guest speakers, or even just regular guests, it is of vital importance to make sure well ahead of time that all the equipment you need is provided for, and that there are sufficient facilities to cope with all you will need (enough tables, chairs, washrooms, coffee machines if needed, etc.).

In any instance, it is important to be able to provide any hardware that may be needed (overhead projectors, easels, perhaps a computer, among other things). If the final results of a study are on floppy disk, and you have no way to read it, then your meeting is subsequently harmed.

A venue is just one part of a series of *Task Requirements* that need to be fulfilled for a successful meeting.

**Task Requirements**

✔ Ensure that the right people attend the meeting - choose the participants for their skills and knowledge.
✔ Ensure that the right number of people attend.
✔ Ensure that the time allocated is reasonable.
✔ Clearly establish goals, priorities, time frames, and schedules before the meeting commences.
✔ Ensure that the physical facilities are appropriate.
✔ Plan Properly. A meeting planner should be well versed at the following.
Having a firm grasp of the problems and objectives.
Determining the best way to deliver the message.
Determining the best way to start the meeting.

Ensure that the right people attend the meeting. This is, perhaps obviously, a very important step. In our ongoing example, Zacharey was given his committee to work with, so he has no choice. However, in larger organizations where there are a large number of members, it may become necessary to pick and choose who will be, and who should be, at any particular meeting. These members should be chosen for their skills and knowledge pertaining to the topics at hand, that have already been chosen by the organizer.

Ensure that the right number of people attend. This, again, is only a concern when you need to pick and choose your meeting members. Most meetings get too large if there are more than 15 members, and become unruly and difficult to manage as a result, while any less than 5 to 8 may be too small, depending on the topic at hand (which, again, should have already been chosen). This is a concept which needs to be thought of case by case.

Ensuring that the time allocated is reasonable. It would be silly to allot an hour for a group of 4 that merely needs to decide where the next meeting will adjourn too. Similarly, two hours may not be nearly enough time to determine a fiscal policy for the upcoming year. Those who participate in your meeting will be generally upset if they've set aside their entire afternoon for a meeting which only takes a short time. Conversely, it's an annoyance to everyone to find that they have been able to accomplish nothing because they needed to vacate the room. Again, this is a topic that needs to be decided meeting by meeting.

Clearly establish goals, priorities, time frames, and schedules before a meeting commences. In our example, Zacharey has a meeting topic of wanting to examine the underlying reasons for student political apathy. He does, however, realize that one meeting will not see the fruition of this topic; instead, he needs to establish goals for each particular meeting. For this first meeting, he may have prescribed as a goal only that the meeting participants (the committee) get to know one another, that they understand the purpose of the committee, and that they form two sub-committees, each with a certain research question to study for the next meeting. Of course, by the fifth meeting (as an example), the meeting goals may change to include such things as developing a public relations programme to convince students they should get more involved. It is vital that the objectives be worded in such a way to differentiate success from failure. This is the only way to immediately judge the meeting's effectiveness.

Of course, the goals need to be given priorities (the committee really should introduce themselves first at a first meeting before breaking off into sub-committees), and these priorities need also be shared. In addition, each priority should be given a time-frame to be worked within: people don't appreciate their time being wasted, and there is no use in spending 3 hours introducing each other; that would be a waste of both your time and the committee's time and productivity would fall through the floor.

Ensure the physical facilities are appropriate. Have a committee member with a seeing-eye dog? Or how about in a wheelchair? Perhaps, even, you have a marathon six hour meeting planned in an office where the restrooms are out of order. Oops. A happy committee is a useful committee.

Proper planning. A meeting planner should have a firm grasp of the problems and objectives to be solved and met. A meeting organizer, or facilitator, is expected to lead and guide the meeting to a fruitful
end. This can not be done effectively if the facilitator does not know what the objectives are. By this point, however, this should no longer be a problem.

**A meeting planner should be able to determine the best way of delivering the message.** This is not an all-encompassing statement meant to generalize a facilitator into the world greatest communicator/propagandist. Instead, it's meant to imply that the facilitator should know how best to tell the participants what the meetings goals and objectives are - most notably this is done through the agenda, but it is also done through the next and final Task Requirement in preparing an opening question.

**How to start the meeting/preparing an opening question.** Meetings don't start on their own - they're not the Big Bang - they need prompting, guiding, and ushering. The opening question you pose to the group will both open discussion and focus the group on what is to be discussed. It is a good idea to phrase this question before the meeting so it is clear, concise, and to the point, otherwise the first 15 to 30 minutes of the meeting may be spent on defining the meeting problem instead of working toward a goal.

For our hero Zacharey, he may pose the opening question to the group as he posed to himself: "What are the underlying reasons that students care so little for campus politics, and are there ways of convincing them that they should get involved?" By asking this question to the group, they get focused and start the meeting on the right track.

**Participants and Guest Speakers**

Know your participants. Know them by name, and know what they do - a person who feels welcomed and useful will be happy and productive.

If you have no choice as to who attends your meetings (as in Zacharey's case), then you can do little more than this except for trying to understand the participants baggage (to be discussed later) and try to work around it. If, on the other hand, you get to choose your participants, be sure to know what they do and what their field of expertise is in. It is worth reiterating that you should choose them for what they can do, not for their social position (you may be tempted to invite your friend, but if he or she is extremely out of place, it'll show).

A guest speaker may be at your meeting for a number of reasons, but generally they are invited for an area of specialty that they can cover that would otherwise not be covered, or covered as well, by the regular participants.

Out of both sheer politeness and usefulness, you should brief this guest speaker before the meeting begins - your guest speaker may know the topic well, but it is up to you to debrief the speaker on the audience (the meeting participants) and on what they know of the topic. There have been many a meeting and public speech gone awry due to miscommunications between the speaker and the audience. Don't let this happen. Use your guest speaker to complement and add to your meeting, not to take over, dominate, or inadvertently insult.

**Agenda**

By this point, you should have all the material and information you need to construct a useful and information agenda. "[The agenda] is a substantive document which informs the members, as well as other interested persons, about how and when the committee will make its decisions." (Tropman, p. 63)
In other words, the agenda puts onto paper all of the decisions made so far by the organizer, and should be distributed as early as possible to the other participants (two weeks is a good time) along with any other documents that may need to be distributed (written reports, minutes, memos, etc.). If all the previous steps have been followed, writing the agenda should flow easily, as it is merely summarizing all those decisions made to date, and putting them in order. The agenda, once distributed, must be kept and followed - this is all but an official document and is the only guide your participants have to plan from. Breaking it would confuse them and disrupt the meeting.

Notes on Why Meetings Fail

This may sound like a negative heading, but it is far easier to point out what can go wrong in the preparation of a meeting than it is to point out what can go right. Jorgensen, Scherer, and Fautsko (1981) provide such a list.

- The subject matter is not relevant.
- The size of the meeting is poor. The ideal size is 7-12 members.
- Meetings are dominated by one person.
- The leadership is poor, and is either too passive, or an autocracy.
- There is no clear objective/objectives.
- The meetings are too long.
- The meetings become politicized.
- Personality clashes.
- People forget what happened at the previous meeting - keep minutes, and distribute them!
- The meetings are just plainly poorly planned.

Traps During Planning and Preparation

- Planning with no data about the participants, their hopes and expectations about the purpose of the meeting.
- Lack of involvement, by those who will be at the meeting.
- Illegible visual aids.
- Lack of variety in meeting place and time.
- Holding a meeting only because it is scheduled - if there's no reason, don't do it!
- Equipment that doesn't work.
- Lack of plans if extra people show up.
- Lack of briefing resource people or speakers.
- No agenda, or a poor one.
- Too many items planned for the time allotted.

Participants

Although participants don't have nearly the planning responsibilities that organizers and facilitators do, they do nevertheless have some responsibilities that must be carried out.

- Background Research
- Reports
- Dealing with Baggage

Background Research
Comparatively to the organizer, there is little background research for a participant to do. In general, a participant is required to know a) his or her fellow participants, their strong points, weak points, and area of interest; b) guest speakers, to be able to prepare discussion questions; c) the agenda and, hence, the meetings goals, objects, and time frames; d) the minutes from the last meeting to know what has already been discussed, and, if necessary; e) any background research required to give a special report.

Example

Maria, one of the members of the meeting group chaired by Zacharey, gets the agenda for the very first meeting. Noting there are no guest speakers, she doesn't do any research into their area of expertise, but she does learn a few things from the secretary about the other members of the group; in this way, she has learned where she fits in. Also, from the agenda, she learns what is to be discussed, and takes the initiative to do some background research into the last three student elections, thereby finding out how many people voted in each, as well as some general research into how many students generally vote in provincial and federal elections. She notices as a result that there is a difference between undergraduate students and graduate students, and makes a note to bring this difference up.

Reports

Simply, if you have a report to prepare, it well, and prepare well before hand. Written reports should be given to the meeting organizer for distribution with the agenda, two weeks before the meeting. This gives the meeting committee plenty of time to read your report as part of their background research, and to prepare potential questions for you.

Additionally, preparing a report that far in advance gives you plenty of time to prepare a sister verbal report if needed. Remember, verbal reports are generally time consuming, so it is wise to prepare for just a few minutes of concise, to the point talk - your committee members will thank you for it.

Baggage

"Baggage," as defined by Hunter, Bailey, and Taylor (1995), are people's already held "ideas, beliefs, hang-ups, desires, tragedies, hopes, fears, and so on." (Hunter, Bailey, and Taylor, p. 36) These authors then give an example of how Baggage works.

Donna mentions in her group that she wants to put the topic Planning on the agenda. One person in the group is planning an overseas trip and spent the previous evening looking through brochures with her husband. On hearing the world Planning she remembers the previous evening with pleasure and starts to daydream about the overseas trip. When asked for her opinion as part of the group discussion she is unable to respond because she has not heard the conversation.

As an individual human being, you have no control whatsoever over the baggage others carry. You do, however, have some control over your own baggage, and you are required to carry it and check it before a meeting begins. Being aware of your baggage before a meeting altogether is a good start.

Exercise - Identifying your Baggage

Purpose: To identify our own baggage
Materials: Watch, large sheet of paper, crayons, felt pens, paints, or pastels.
Time: One hour
**Instructions:** On a large sheet of paper, draw a likeness of a big bag, paper or otherwise. In the bag, write your hopes, fears, dreams, desires, and hang-ups. After writing this, reflect quietly on the notes you have written, and add or change as you see fit.

This topic and idea will be built on in the next section.

**Summary**

In the first unit, describing the items which need to be examined before a meeting begins, we saw that an organizer has a variety of tasks to attend to for the group. The first of these is to arrange suitable meeting material and run it through the RISK Acronym to examine its usefulness, and the next is to obtain a suitable venue with everything the group will need. This is followed by running through the list of Task Requirements, briefing both the participants and any guest speakers that may be there, and finished by distributing the agenda. Of course, any facilitator should be familiar with reasons why meetings may fail to work against them, along with being knowledgeable of traps that may spring up. On the participants side, we were shown that they need to do any necessary background research on the topic that may be necessary, including compiling reports, and that they need to be aware of their personal baggage, and deal with it if it may pose a problem.

**Unit 2- During the Meeting**

**Overview of the Previous Unit**

In the last unit you were taught the reasons for holding a meeting and how to prepare for a meeting as both a regular participant and an organizer. The RISK Acronym was introduced to assist you in focussing the meeting questions and, in turn, the agenda. As an organizer, you were instructed in the areas of knowledge you should possess about the participants and any guest speakers, and you were also told about possible traps during the planning stage you may run into. As a participant, you should now know what to know about the other participants and rules about compiling written reports. Finally, you should have an understanding of how to clear your head of distracting thoughts. This unit continues to lead you from that last step.

**Organizers**

The meeting, of course, is the crucial time in the meeting process when the organizer and the participants actually get together and decide things. As an organizer of a meeting, you are responsible for the following topics.

- Opening the Meeting.
- Clearing your, and the participants, Baggage.
- Speaking.
- Mediating.
- Idea Generating Techniques.
- Notes on Why Meetings Fail.
- Notes on What Makes a good Mediator.

**Opening a Meeting**

The way a meeting is opened serves several purposes, ranging from re-informing the members as to what is to be discussed, to introducing members to each other to make them feel comfortable, to directing the initial flow of conversation. A poor meeting opening leaves the members feeling flustered and confused as to what is expected both of them and the group as a whole, and much time may end
up being spent in merely focussing on an avenue of travel. Martin Jones (1980) has prepared a small list of suggestions to consider for opening a meeting effectively.

Make the members feel comfortable. Introduce yourself to them and explain that you're pleased they're there. Be sure to impress upon them that their contribution is valuable - they wouldn't be at the meeting to begin if that wasn't the case.

Introduce the subject and outline the rules for discussion. This is where you reaffirm to the members how long the meeting will last, its purpose, when breaks are planned, what the goals are, and what the members role in the meeting is. If found to be necessary, this is also a good point to help members clear their baggage, a concept introduced in the last chapter.

How to get members involved. Open the meeting with an example, film, case study, assignment, or opening question: many of these methods entice the members into the conversation and topics at hand, with perhaps the exception of a film, which may induce the members into sleep. Don't be discouraged if the members hesitate at first - if necessary, encourage them along or rephrase some key questions. They'll come along once they realize you really do value their input.

Example

Our hero, Zacharey, paces in the hall about thirty minutes before his first meeting with this group. He's done all his background research, he knows what needs to be accomplished, he's sent out the agenda, and everything has been prepared properly. However, this is the first meeting this group will have, and first impressions mean a lot.

As the meeting nears he sets out coffee cups and coasters for everyone and waits. As each participant enters the room he shakes their hand and introduces himself individually. When the meeting starts he stands, introduces himself again and offers a little introduction about who he is and what he does. He then continues by introducing the members of the group to each other and offering them a chance to offer information about themselves as well.

After all of the introductions have been made, Zacharey goes on to explain the purpose of the group and the purpose of this meeting: namely, to introduce the topic of student apathy to the meeting members, and to describe to them their role in studying it.

He offers a few examples of student apathy, as the group will use it, with some charts. At The University of Calgary, he explains, only 17% of the student body voted in the last Student Union election, which was the highest turn out they've ever had. Meanwhile, McGill University continually gets turnouts of 40%, but The University of Toronto in turn gets only 20%. These are all, he notes, substantially below voter turn out for a governmental election. The purpose of this group, he explains, is to study why this is and, if possible, to study the creation of a public relations programme to combat this apathy.

Dealing with Baggage

In the last chapter we introduced the concept of Baggage as "ideas, beliefs, hang-ups, desires, tragedies, hopes, fears, and so on," and gave an example of how people's baggage may interfere with the goings-on of a meeting in a rather innocent manner. Baggage, however, and the failure to deal with it may lead to far more catastrophic results than the example previously given (imagine one persons "beliefs" clashing with another persons "hang-ups" and it isn't hard to see how many topics can lead to angry arguments). Before a meeting truly progresses, it is useful, and in some
instances necessary, to deal with the participants baggage to get it out in the open before any potential problems have the opportunity to surface.

Exercise - Identifying Group Baggage
(This is a variation of the exercise taught in the last chapter on identifying the baggage you carry)

Purpose: To identify your own baggage.
Materials: Watch, large sheet of paper for each participant, plus either crayons, felt pens, paints or pastels, in a range of colors.
Time: 1 hour.

Instructions: Have each person draw the image of a big bag taking up most of the sheet of paper. In the bag have them write and draw their fears, hopes, dreams, desires, and hang-ups. Give time for each topic. Encourage a quiet reflective atmosphere. Total time 15 minutes. Then have each person pair up with someone they don't know well and share their drawing. Allow 10 minutes. Next, put all the drawings on display for participants to walk around and look at. Allow 5 minutes. Finally, come back to the whole group and have a discussion on what people noticed.

Exercise - Identifying Strongly Held Beliefs

Purpose: To identify and share strongly held beliefs.
Materials: Pens and paper plus large sheet of paper or whiteboard.
Time: 1 hour

Process: Have participants write down their strongly held beliefs on a sheet of paper. Give an area of focus to the group such as work, play, babies, bosses, computers, sports. Have a round in the whole group with each person sharing their beliefs. Ask participants to note on their paper any of their beliefs which are shared by others. At the end of the round, develop a lit (on the large sheet of paper) of beliefs which are held by more than one person in the group and note the number of people with that belief. Are there any beliefs shared by the whole group?

The first of these two exercises, as stated briefly, should be done in the very first meeting a group has or, if not, as soon as possible, possibly even in a relaxed, informal setting. This would serve the purpose of letting everyone know where potential "touchy spots" are with the others and, if needed, avoid them.

Example

Zacharey, chairing his small group of eight for the first time, notices that the group consists of 5 females and 3 males, with 2 African-Americans, 1 Hispanic, and 1 French Canadian. Fearing that a cultural problem may result from some inadvertent misunderstandings, he calls for the group to engage in sharing and understanding their baggage. As the group learns more about the other members of the group, they learn indeed that one female's brother has terminal cancer, and another has had an abortion. The other members learn, as a result, that jokes in these areas may not be appreciated.

During the fourth meeting the group holds, it becomes apparent to Zacharey that there is a decisive split among the group as to several fundamental beliefs about student politics. He decides to set aside an hour of this meeting to run through the second exercise to determine who in the group holds what beliefs. After the exercise is complete, he sees that 3 members of the group believe inherently that not only are students apathetic, but that they are all greedy and neither know how
to or want to put in an "honest days work" for pay. This, obviously, is a belief that the group now knows about and can both work with and around.

**Speaking**

This hypertext is not meant to teach public speaking skills, but there are certain rules and topics that should be known concerning speaking specifically in a meeting.

- Speak no more than 25% of the time. Much more than this becomes overbearing, while much less and the focus of conversation may be lost.
- Show respect for all ideas. Saying, outright, "no" is a great way to lose input.
- Do not ever take the credit for others. Aside from losing the usefulness of the person with the stolen idea, that's just plain sleazy.
- Take responsibility for your actions and words. If you repeatedly dismiss the ideas one person in the group brings up, be prepared to defend those.
- Use flexible words - unless absolutely necessary, or dealing with a certainty, never tell the group that "this is how it will be" or "that will not happen."
- However, this does not mean you should "waffle" on your position or speak in such a way as to not be understood. Speak clearly and to the point. No one wants to be forced to sit through an hour of riddles to be able to help answer a question.

Although these are some rules that anyone in a meeting could use, they are meant specifically for those facilitating meetings, as facilitators should be the ones doing the majority of the talking.

**Mediating**

Mediators, of course, and facilitators, are faced with the responsibility of mediating. With facilitators lies the duties of keeping the conversation focussed, of keeping tempers in check, making sure everyone has the opportunity to speak, and maintaining enthusiasm. This, of course, is not an easy thing to do - there are many reasons why peoples attention may wander, and they're not necessarily all a result of a boring meeting or boorish material. There are, however, some ways you can maintain enthusiasm while fulfilling your role as mediator.

*Provide variety*, if at all possible, to keep people's minds occupied. 30 to 45 minutes is the most you can reasonably expect for people to be focussed on the same topic.

*Avoid reading*. There is little more droll than being read to, unless you are a young child needing to go to sleep. Don't treat your members as young children needing to go to sleep - they will reward you for this decision with productivity.

*Prevent side conversations or domination by one or a few*. Not only do side conversations prevent those involved in them from participating, but they may prevent those around them from concentrating. To avoid this, simply ask those involved, innocently, to share with the group their ideas. Another way is to simply keep quiet until they're aware of the situation..

It is not an easy manner to convince people who are inherently shy to speak up, nor is it easy to prevent those who are inherently boisterous to calm down a little. Nothing, of course, is wrong with either type of person, but too much input from one person may lead to even less input from another person who was already less-inclined to offer any.

One method to encourage contribution from everyone is to hand out tokens to people as soon as they present an idea. The one or two people with the fewest tokens at the end of the meeting will then
be assigned a small task, such as tidying the room or cleaning any dishes that may have been used. This, however, does not take care of the ramblers.

The best way to take care of ramblers is to thank them for their opinion, advice, and contribution, but ask for another, perhaps contrary position even, from someone else. Ramblers are not evil people - never ever penalize a person for contributing, even too much.

The conversation ventures off topic. There are times, most people have been witness to them, when the conversation involved in a group gets so confused that it steers itself way off topic and down a completely different highway. This happens generally as the result of poor focus.

The most direct and simple way to refocus the group is to ask a question which leads the group back to the main topic at hand. Another method would be to ask, tactfully, how the remarks relate to the main discussion - this, however, may be a more effective device for those who incessantly take hold of the topic and move it off course. Another method is to apologize for not making the objectives of the meeting clear and rephrase them. This last method has the advantage of laying blame on no one but yourself, and thereby not causing them discomfort.

Example

Zacharey holds his second meeting, in which the group is to discuss statistics on federal voting patterns to see if they have a correlation. The discussion started vigorously with Zacharey handing out plenty of poker chips to those with good thoughts and finding himself having to lead the discussion very little. However, the conversations soon shift to voting patterns, and reasons why three of the participants refused to vote the last election, as "all of the choices were just as bad as the others." Skilfully, Zacharey wonders aloud if the reasons these three members had could be related somehow to students not voting in student council elections. The group considers this, and the conversation continues.

Idea Generating Techniques

Meetings are meant to solve problems, to answer questions, and to generate ideas. Coleman Finkel (1976) lists 5 reasons that meetings can be held and, of them, 4 of them deal with needing to, in some way or another, develop or share ideas. This section describes various idea and methods that can be used to generate ideas for a variety of situations. Martin Jones (1980) has listed a 6-step process to solving problem/generating ideas in meetings.

✔ State the problem and the reason why it must be solved. Tell the members how the problem will affect things, and the impact their solution will have.

✔ Analyze the causes of the problem, if possible. This may, in fact, be the reason for generating ideas: to come up with reasons why the problem exists, in which case, this step is merged with step 3.

✔ Generate the ideas, or use one of the methods described to solve a problem or answer a question. Various methods follow.

✔ Determine the best solution. If more than one solution to a problem, or more than one idea was generated when only one was needed, choose the best. This can be done either using the Pros and Cons method listed, or by some form of vote, or even by the facilitator - in small groups, it is generally better for the group as a whole to decide, so a vote may be the most pleasant.

✔ Select the best solution, or choose which solutions/ideas to implement or follow. This is related very closely with step 4.

✔ Implement the solution. This is done, of course, outside of the meeting.
Brainstorming

Purpose: To generate a large number of ideas, regardless of quality. The idea behind Brainstorming is to generate a lot of ideas quickly, with no regard for quality; presumably, out of all the ideas present, there will be enough to form two or three good ideas. Many ideas in a brainstorming session, however, do not get presented due to fear of embarrassment - this is a problem that the facilitator needs to work around.

There are two premises behind brainstorming. The first is that all ideas have potential worth; the second in that no idea is too ridiculous to be written down; good parts of every idea can be salvaged by the group. (Jorgensen, Scherer, and Fautsko, p. 46) There is really no one "better" way to hold a brainstorming session than another. Some people suggest writing down all ideas as they come without thought, while others suggest rewording each idea to the satisfaction of the originator.

If you have a rather multicultural and/or multilingual group, this may be the better method to help close cultural gaps in understanding. At any rate, the ideas must all be written down for all to see, a whiteboard or blackboard is good. If response is sluggish due to embarrassment, make the group feel jovial - have them hop on a foot, or somehow get them laughing; it will loosen them up. If certain people insist on laughing or otherwise mocking other people's ideas, encourage the rest of the group to laugh at that person every time he or she does - the brunt of the mockery will then be shifted.

Self-Inquiry

Self inquiry is a personal, internal, quiet inquiry method into looking at a topic. Simply, all the group needs to do is spend 10 or 15 minutes quietly, thinking on two questions:

- What are some of the factors which you feel exist in this group that may block you from free and open communication?
- What initiatives might a member like yourself take to help the group begin removing these blocks to communication, and how do I feel I can contribute to the problem at hand?

After this small time of self inquiry, the group should be encouraged to share their reflections with each other - possible solutions to the topics at hand may be found.

Nominal Group Technique

1. The group leader poses a pre-tested question and provides a sample solution to illustrate complexity and scope needed. Members are not allowed to ask questions at this point.
2. Sit members in a V shape with a flip chart or blackboard at open end.
3. Participants write down ideas in silence (perhaps from Self Inquiry).
4. Each member announces ideas in a round-robin session, still with no discussion. Ideas are entered on the board.
5. Participants discuss and evaluate each idea.
6. Members take a silent vote in which they rank the ideas.

Obviously, this technique requires more planning on the facilitators part than the others discussed so far. It does, however, have the advantage of giving the participants an example, then allowing them time to think, and thereby hopefully retrieving insightful solutions.

Interaction Method
This method, designed by Michael Doyle, is rather akin to a roleplaying model. Each member is assigned one of four roles: facilitator, recorder, group member, or manager/chairperson. The "facilitator" is an impartial leader whose purpose is to keep everyone else impartial and otherwise play a neutral role. The "recorder" only records, and keeps the ideas prominently displayed on a blackboard or whiteboard. The "group members" are active participants, and can even overrule the facilitator in decisions. The regular facilitator/chairperson becomes an active member of the group for the duration of the roleplay.

The interaction is useful as a self-correcting mechanism - if ideas are slow to flow from your group, allowing this form of interaction may spur them into action. In essence, this is a mini "meeting within a meeting" with the sole purpose of working on one problem as opposed to several. It is possible to use this method several times within a regular meeting for different topics, with each person changing 'roles' each time. Of course, the decision making process to be used in each 'role playing session' can also change, and can encompass any of the other methods already taught in this text.

Example

Zacharey decides that his fellow participants are a little too shy all around in offering advice. So, using the interaction method to try and solve two dilemmas, he offers the "mantle" of facilitator to one person for the first problem, and another for the second, while becoming a "member" for both. In this way, he hopes the group loosens up some and frees their own personal inhibitions in a group setting.

Unstructured Rounds

During an unstructured round, each person is allowed to speak on a topic until they are completed, without interruption. The rest of the group may take notes, but they are not allowed to comment. When that person is done speaking, the next person who wants to speak is allowed. Each person may speak only once. When everyone has said what they feel comfortable with the facilitator summarizes the views, including the similarities and differences, and checks this with the group. At this point, there should be a wide range of ideas to either advance on as a group or to reflect upon privately and internally in another round of self-inquiry. The free-flow of thought may bring out the best ideas.

Example

Maria, having plenty to say on the topic of student volunteer work, makes a 5 minute comparison between the number of man hours students volunteer each year and "student apathy" as it relates to student union election turnouts. Jonathan, thinking he can take that a step further, raises his hand and gets queued by Zacharey. He, in turn, discusses a few minutes about the necessity of volunteer work, and about his own personal views of the usefulness, or lack of it, of student politics. The conversation continues, one at a time, until everyone who has something to say says it. Zacharey then summarizes these thoughts, which he has taken notes on, and the group takes a few of those ideas to expand open in further study.

Structured Rounds

Clearly identify an issue - write it on a large sheet of paper and display it prominently. Ask someone to begin and choose a direction for the others to follow, e.g., clockwise around the table. Again, as in unstructured rounds, group members are given the full opportunity to speak and not be interrupted for the duration of the allotted time. If a group member does not wish to contribute, they may pass.
At the end of the round, the presented views are summarized by the facilitator, including the similarities and differences.

It may be necessary to gently remind the participants not to interrupt or respond out of turn, and you may also need to encourage the shyer members to speak. If you hold several rounds, it can be useful to begin with a different person each time.

Both unstructured and structured rounds are basic techniques for groups. They can be used as initial methods of exploring an issue or problem, and can readily lead into other methods such as brainstorming or interaction. They are also useful in conflict resolution as they will bring out a range of views in hopefully a peaceful manner. Their power is as a group technique rather than an individual point of view, as each person can build on the ideas brought up by those who spoke before them, particularly if there is more than one round to go.

► Example

Zacharey, taking an idea from the last Unstructured Round that the group spontaneously burst into, decides to expand upon that idea as he thinks it has plenty of merit. So he writes the idea on the whiteboard at the front of the room right before the next meeting starts and lets the members sit where they may. He tells them all to think about that idea for five minutes of Self-Inquiry. When that five minutes is up, he arbitrarily chooses a person to begin the topic of conversation, and tells the rest of the group who will speak, in turn. The group listens quietly while each member speaks without interruption and, after everyone has spoken, Zacharey summarizes the views and the group chooses the better ideas for further discussion.

Pros and Cons

Pros and Cons, as described by Hunter, Bailey, and Taylor (1995), builds on the previous concept of brainstorming, and is used to help clarify an issue with two or more divergent points or avenues of progression. The idea is simple: spend 5 or 10 minutes brainstorming all the positive aspects of an idea, then spend 5 or 10 minutes brainstorming the negative aspects of the same idea. At that point, take a break and move to the next topic. After all pros and cons have been brainstormed, have the group look at the lists and weigh the positive and negative aspects of each. Obviously, these need ideas to be written down.

Concluding the Meeting

Thank the participants for their time and outline what they have accomplished - they should leave with a good feeling about the meeting that they have accomplished something useful, and look forward to the next meeting. Cookies are a nice touch to part with, but giving them a sense of usefulness will go much farther.

Notes on Why Meetings Fail

- The subject matter is not relevant. A good meeting has the right people dealing with the right problem.
- The size of the meeting is either too large or too small.
- Meetings are dominated by one person. Aside from allowing only one view, a dominating person generally causes the others to withdraw, and this withdrawal is them viewed as ascent to the one dominating view.
The leadership is poor. Be neither passive nor autocratic: passivity leads to an uncertain and dubious outcome, while autocratic leaders generally turn meetings into "rubber stamps" with the members merely voting the facilitators feelings through.

The meetings have no clear objective. "Can someone tell me what we are doing here?" If no one can, the meeting will almost certainly ramble in no useful direction.

Meetings are too long. Fatigue is no emotion to draw conclusions or solve problems on.

Meetings become politicized. Don't let the politics of the meeting become the end over the means.

Personality clashes.

Nothing changes as a result of the meeting. Don't let your members feel useless.

Notes on Effective Facilitating

The effective chairman...

✓ speaks no more than 25% of the time.
✓ shows respect for others and their ideas.
✓ doesn't take credit for the work of others.
✓ takes responsibility for his or her actions.
✓ is flexible and willing to modify a personal opinion.
✓ speaks crisply and to the point.

Traps During the Meeting

✓ No sharing of the agenda.
✓ Formal, classroom style teaching. This creates a feeling that all the wisdom comes from one part of the room.
✓ The meeting starts with nothing to do for early arrivals.
✓ Too long introductions of special consultants or helpers. This may create a psychological distance between speakers and members.
✓ Long, drawn out speakers. Think, "snooze"
✓ Total reliance on one expert. It is better to use the expert to "uncork" the members resources, or the members may feel unwanted, unneeded, and inferior.
✓ Too long coffee breaks. This disrupts continuity.
✓ Failure to deal with members feelings. They are people, and they may have had a bad day.
✓ No record of what has been said or done. Minutes should be taken and distributed with the agenda.
✓ Neglecting to carry the group "into the future," by telling them how their work is affecting other work being done.

Participants

The participants main area of concern, aside from offering thoughtful insight (which is not the aim of this text) falls within the realm of communication. From asking questions of the mediator and the other members, to getting a personal point across, to plain ole' listening, communication is a participants most important friend during a meeting.

✓ Listening.
✓ Speaking.
✓ Giving Reports.
✓ Questions.
✓ List of Effecting Meeting Communication.
✓ The Effective Participant: Notes
Listening

Listening, and paying attention, is not an easy thing to do, yet many take it for granted. Here are a few points to remember about listening.

- Don't compare yourself to the speaker.
- Don't compare the speaker to others - people are individuals. Treat them that way.
- Don't think about what you are going to say next unless it is a relevant query/question/suggestion to the topic currently being spoken.
- Listen to people, don't give them advice.
- Don't "know it already." You can always learn something new.
- Jumping to conclusions is bad.
- Don't try to read minds.
- Listen to both the words and the emotions behind them.
- Also listen to what is not being said, and the silences involved.

**Exercise - Practising Free Attention**

**Purpose:** To practice being present to another person.

**Materials:** Watch.

**Time:** 10 to 30 minutes.

**Process:** Have group members (or, conversely, do this alone with a friend) sit facing one another in pairs. Get them to initiate eye contact with each other for five minutes then, after practice, extend this to 15 or 20 minutes. During the exercise, ask an occasional question like: Are you present to your partner or have you drifted off somewhere? or Do you have enough attention to meet, and be present for your partner? After the time is up, invite partners to share their experience verbally with one another.

Speaking

Speaking is a topic much more easily learned that listening. When you are speaking, you are "in control" and hence much more likely to be focused than when listening, but one must still watch for "rambling." Although there have been entire books and lectures given on the topic of effective speaking, for the purpose of small groups, there are four tips that you can heed to be fairly sure you will be an effective speaker.

✓ Be receiver-oriented. Talk to your listener, not through them.
✓ Be brief, but to the point.
✓ Be credible. Don't just try to sound impressive, actually be it.
✓ Encourage feedback. If you do, and if you get off-topic, your listeners will let you know.

In addition, there are a few speaking blocks to avoid which, if avoided, will assist even further in your journey to good small group speaking.

Don't say...

- "It's not that important." Any question you're asked is important, even if it is only to tell you you're getting off topic.
"I'll tell you next week." Either tell now, or say that you don't know - don't be embarrassed to admit you don't know everything.

"I've said it once and I won't say it again." Were you clear the first time? Perhaps there was a lawnmower in the background causing noise.

"They must know what I think by now." Oh really?

"No one ever listens to me." Aside from purely whining, if this is a problem, you should look into the reasons as to why.

**Giving Reports**

Reports are a nuisance to give verbally. They quickly become time-consuming and generally offer only information in the time the group could spend making decisions. In addition, verbal reports quite often turn into long escapades even when there is nothing to say - if a person is invited to give a report, that person will generally give one, even if there is nothing to say.

Instead, give the group a typed summary, in one or two paragraphs, of your report, and walk them through the summary verbally, expanding only where they have questions. Four points in handling report summaries follow.

✔ List only the relevant parts.
✔ Note expected activity - if part of your report deals with information that the group doesn't need to deal with, don't mention it.
✔ Summarize those parts requiring no action from the group.
✔ Send printed executive summaries along with your verbal report.

**Questions**

Questions, of course, are your prime means of obtaining information you don't know, and are the main form of problem solving; they can be direct to a particular person (e.g., "What do you mean by ... ?") or indirect to the entire group ("What if we looked at annual income instead of federal voting patterns for a relationship?"). Questions, if not used right, not only lead to poor answers, but answers that are not relevant to the meeting/topic of discussion.

• **Points to Remember About Questions**

**Don't...**

• ask yes or no questions - they cut off discussion.
• ask leading questions - they suggest a desired answer, and hence a somewhat closed one.
• ask personal or tricky questions. Stick to the topic at hand, and strive for a goal.

**Do...**

✔ use the "5 W" questions - they can be provocative and like to produce insights.
✔ encourage full and articulate answers.
✔ show interest in answers.
✔ use open rather than closed questions. An open question encourages conversation and, hopefully, thought. A closed question requires generally a yes or no.
A Quick List: Effective Meeting Communication

- Meeting communication should be "receiver-oriented." Communication should be based in frames of reference shared with the received.
- If possible, approach your listener in "prime time." Say what you need to say at the right time, not before or after. This, however, is difficult to do with scheduled meetings - some people are morning people while others are far from it.
- Be brief and to the point, as in giving reports. No one expects you to offer the 1990's version of the Iliad.
- Your message should be credible. You should be able to back up your suggestions with something other than, "Really! My mother told me!"
- Encourage feedback. Communication is a two way process, and without feedback your own idea will not grow and prosper

The Effective Participant: Notes

The Effective Participant...

- acquires all the information needed.
- knows peoples strong point, weak points, goals, values, and quirks (baggage).
- shows others why he or she is valuable to the group.
- is well prepared in understanding the purpose and objectives of the meeting. (Read the agenda!)
- arrives punctually.
- shows an openness to ideas, listens to others, refrains from side conversations, pointless arguments, and irrelevant issues.

Summary

We learned in unit 2 how to communicate as both a facilitator and a participant: we learned about listening, speaking, asking questions and, generally, how to get your point across effectively while not destroying the ideas of others in the case of conflict. Mostly, however, we learned about various methods for generating ideas, from Brainstorming, to Pros and Cons and such things as Structured and Unstructured Rounds. In addition, there were notes on how a facilitator can facilitate effectively without losing control, and notes on various traps that both the facilitator and participants can fall into and hence should avoid. Finally, the unit ended with a list of effective meeting communication habits, and a small list on what makes an effective participant.

Unit 3 - After the Meeting

Summary of Previous Unit

Unit 2 took you through the meeting process with a heavy emphasis on communication among members: speaking, mediating, questions, and listening were among the major aspects covered. These four topics, coupled with minds that have been cleared from baggage, are the basis for clear communication in the many idea-generating techniques offered.

Now that the meeting has ended, does that mean the work is done? No. Now the plans must not only begin for the next meeting, but the decisions made from this last meeting must be put into motion. Additionally, the last meeting should be studied to see where it can be improved for the next one - nothing is ever perfect.

- Ensure Action.
Evaluations.

Ensure Action

A meeting, if it results in no action to be taken, should almost not have been held, unless it was purely a meeting to convey information to others. At the end of the meeting, or by the next day, a list should be prepared and distributed to everyone involved. The list should have the following information, in point form for preciseness, on it.

* **Who** is going to do **What** by **When**

The note should make people feel useful. People, unless otherwise necessary, should not be given "meaningless" tasks such as, "Bob is going to order the donuts before Friday." These small, insignificant tasks may be useful for someone who is going on vacation but still wants to take part, but for the most part, people want to feel useful.

Evaluations

Unless your meeting was perfect, you won’t need to evaluate it or discover ways of improving for your next meetings. How do you know if your meeting was perfect? You evaluate it.

Evaluations should not be done immediately. Rather, the participants should be given a day or two to reflect on the meeting and what was accomplished. On the other hands, the evaluations should not be too far in the distant future, or people will tend to forget the process of how things happened.

There are two things that will need to be evaluated. The first is the process and general usefulness of the meeting itself. The second is the usefulness of the decisions made in that meeting. These two topics are not mutually exclusive, of course, but can be examined on their own.

Evaluation of Decisions

The best way to grade the decisions is, frankly, to do it on your own as meeting facilitator. As everyone would have had their opportunity to come to the best decision possible during the meeting, it is up to you to grade those decisions to see how well the group works together, how the decision making methods used work, and generally to see if the meetings are working at all. The most basic way to grade decisions, and perhaps the only one necessary for a small group, is the following.

* Gather all the documents necessary (minutes and documents stating decisions made).
* Summarize and review the decisions.
* Grade them.

Any procedure, really, should be fine however as long as it takes three thoughts into consideration. First, it should include a systematic recording of the decisions (which means to record them in the first place), then it should include a systematic assessment of each and every decision using the same criteria. If necessary, the results should result in a modification of the meeting procedures and decision making methods.

Evaluations of Meeting Results

When you are ready to evaluate the overall performance of a meeting there are four rules and questions that need to be remembered and asked.
What do you hope to achieve in this evaluation, and what will provide honest answers?

Your actions should show the participants you are seriously interested in them and their feedback.

Tell the participants what you intend to do with the results.

Get real information, not praise.

There are two techniques to use in an overall post meeting evaluation: A questionnaire to the participants, and interviews with the participants.

Questionnaires.

These should query the members as to what they've learned, and how they viewed the decision making process. They should be simple and straightforward, and allow for subjective feelings. You may want to consider pre-testing the questionnaire with a smaller, different group.

Interviews.

These can be done either individually or in focus groups, and should be used in addition to the questionnaires. Pending on how tight-knit, or how well your group works together, you may just have a focus group at the end of the meeting.

The results, regardless of the interview style chosen, need to be shared with the group, either through a special mailing or an informal gathering, and the results should show that the head, you, are truly concerned not only about the topic, but of them and their usefulness to the project.

Example

Zacharey, fearing that after three meetings the group still isn't producing good results, decides to evaluate the decisions made in the last one. After pulling together all the documents he notices, for the first time, that only two decisions per three hour meeting are being made. He notices, however, that the two decisions made at the last meeting were very good. So, he thinks that he should look into where the time is being wasted, and where it could be improved.

He sends out questionnaires to the participants, asking them such things as how they like the decision-making process, what they think of the problems they are working on, and generally which parts of the meetings they find most useful. He receives the questionnaires and studies them. At the end of the next meeting he sets aside 15 minutes to discuss the questionnaire to try and determine where time can be put to better use.

Summary

The last, and smallest, unit offered small notes on how to study a meeting for its perceived effectiveness. It did not, however, offer methods for improvements - any improvements to be made need to be made in the steps provided in either Unit 1 or Unit 2, or both. With a proper evaluation, and with honest feedback from the participants, these improvements should be made rather clear.
Appendix Three: Evaluation Questionnaire and Examination

1) Year of Birth __________
2) Gender: Male Female

3) Year in University 1 2 3 4 Graduate Student

4) Major __________________________

5) Have you been a member of an organization that conducts regular meetings? Yes No

5a) Do you have a leadership role in this organization, or have you had such a role?

   YES: Chair
   Secretary
   Treasurer
   Other (describe: ____________________ )

   NO: I am/was "only" an active participant

5b) Could the meetings you attend(ed) be improved? Yes No
   Please elaborate: (How so, or why not?)

   __________________________

5c) In general, how satisfied are you with meetings you attended?

   Not at all Satisfied 1 2 3 4 5 6 7 8 9 10 Very Satisfied

5d) Have you ever read material in how to improve meetings? Yes No

7) How much experience do you have in meetings?

   None 1 2 3 4 5 6 7 8 9 10 Have attended many meetings

8) How much computer experience do you have?

   None 1 2 3 4 5 6 7 8 9 10 Consider myself an expert

9) How comfortable are you with computers?

   Extremely Uncomfortable 1 2 3 4 5 6 7 8 9 10 Very Comfortable

10) Have you ever used any computerized self-instruction programs? Yes No
Scenarios

1) You are organizing a meeting. You work for a non-profit organization, and your group of eight has been charged with developing a public relations fund raising event, or series of events, for a local children’s hospital. Your group consists of five females and three males, all of whom are in their mid-20’s to mid-30’s. One of the females is six months pregnant, and one of the younger males is divorced. None of the participants have met each other, as far as you know.

Using the information you learned about pre-meeting material, describe in two or three paragraphs how you would go about organizing and developing the material for this meeting. You may assume you have all the amenities a non-profit organization would have, and are located in a major metropolitan centre.

2a) You are ready to conduct your first meeting. How would you open this first meeting?

2b) As the meeting progresses, you find the group is unusually quiet. When called upon for an opinion for a money-raising campaign, one of the men offered a curt response suggesting a bingo. One of the women quickly retorted that she felt a bingo was an insulting way to raise money for such a cause, as the people involved are not willingly giving their money to the children. The group again lapsed into silence.

Using the information you learned on how to conduct meetings, please describe in a few paragraphs how you would respond to the immediate denial of the suggestion, and how you would encourage the group to become more open, talkative, and constructive.

3) Your meeting has ended. The group has parted a little uncomfortably, and you realize after they have left that very little was accomplished at all. Using the information you learned concerning evaluating meetings, please describe in a few paragraphs how you would evaluate this meeting.
Do you feel you covered all the material?  Yes  No

How confident are you that you could conduct a successful meeting after reading this package?

Not confident at all  1  2  3  4  5  6  7  8  9  10  Very confident

How confident are you that you could participate successfully in a meeting after reading this package?

Not confident at all  1  2  3  4  5  6  7  8  9  10  Very confident

This program was easy to interact with.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

This package was fun.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

This package was too constrictive.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

This package was too flexible.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

The information presented was easy to understand.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

This package was easy to use.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

I enjoyed learning from this program.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree

I enjoying going through this program.

Strongly disagree  1  2  3  4  5  6  7  8  9  10  Strongly agree
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