

**THE UTILIZATION-FOCUSED EVALUATION OF A
MODULARIZED MATH PROGRAM**

**A THESIS
SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE
MASTER OF ADULT EDUCATION**

BY

PAMELA D. SMITH

**SAINT FRANCIS XAVIER UNIVERSITY
ANTIGONISH, NOVA SCOTIA**

AUGUST 2000



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ABSTRACT

This study evolved from the concerns expressed by students and staff about the use of modules for the instruction of math to adults in an upgrading department of a community college in northern Alberta. While many students were successful in the courses in the past, other students voiced the opinion that they would prefer a traditional classroom lecture to individualized learning using modules. The staff responsible for instructing the modularized math courses expressed concerns regarding the retention and success rates in these courses. Other instructors in the department, and college administrators, had also expressed concerns about the retention and success rates of students in the courses and had asked questions about the instructional costs incurred by offering the courses through a modularized system of instruction.

During this study, I worked collaboratively with the instructors and instructional assistants who teach the modularized math courses in the upgrading department of the college. Together, we planned, designed, and implemented a utilization-focused evaluation of the modularized math courses taught by the department. Information was gathered from individual interviews with each member of the instructional staff, student questionnaires, discussion questions completed by three student groups, and statistical data provided by the college registrar's office. The assessment of the value of the study is based on my own observations, and on feedback from the student participants and from the instructional staff.

The evaluation results indicated that the students who participated in the evaluation study viewed the modularized process, the modules, and the amount of individualized instruction they received in their math courses quite favorably. Regardless

of the reasons why the students responded as they did, the evaluation process itself was a valuable opportunity for both students and instructors to offer their opinions about how well the program was meeting the needs of the students and how the program could be improved.

ACKNOWLEDGMENTS

Many individuals contributed to my success completing this thesis and the course work necessary to complete the requirements for the Master of Adult Education. First, I would like to thank my advisor, Leona English, who has worked with me since orientation. Leona provided me with long distance support and quick responses to my queries and concerns. She was motivating, encouraging, and supportive throughout my program of studies.

Second, I want to express my appreciation and gratitude to my colleagues and friends who encouraged me to pursue this opportunity for my personal and professional growth. I especially want to thank my colleagues in the math instructional group of the upgrading department of the college where I work. They were always cooperative and friendly to work with but never hesitated to question my work or suggest new solutions to problems that arose. This group consisted of Jean Nordin, coordinator of the math lab, as well as Christine Frattini, Mary Lou Lane, Arlene Loewen, Sukhvir Sandhu, Bill Shaw, and Khris Weeks.

Finally, I want to thank my family, Larry, Nathan, and Cory, who gave me their full support and encouragement to complete this program of study. In addition to offering me love and support, my husband Larry occasionally was also my proofreader and internet research assistant.

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CHAPTER 1

INTRODUCTION

Programs in adult basic education (ABE) and academic upgrading are two examples of adult educational opportunities available at many Canadian community colleges. Developmental programs such as ABE and academic upgrading provide students with the opportunity to build basic skills and to acquire the skills needed for entrance into post-secondary programs. ABE and academic upgrading programs vary in expected outcomes and program design. The program design may or may not include program evaluation as a tool to encourage ongoing change and improvement. However, program planning and evaluation play a large role in the continued success of developmental programs, ensuring that students' needs are met and, in many cases, determining whether or not funding for the programs continues for another year.

Students in ABE, academic upgrading, and other developmental and basic skills programs are very diverse. The characteristics of adult learners in general, and this group in particular, must be considered if these programs are to meet students' needs. Because many ABE, upgrading, and developmental or basic skills programs are situated in community colleges, the planning, funding, and evaluation of the programs are part of a much larger process that involves the politics and culture of the institution.

In this thesis, I explore the process of planning, designing, and implementing a utilization-focused evaluation of a modularized math program for students in an academic upgrading program at a community college.

Background

At a community college in northern Alberta, classes for all ABE and academic upgrading math courses, with the exception of the grade 12 college preparatory course, use self-instructional modules and individualized learning. These classes are offered in a 40-seat classroom known as the math laboratory or math lab.

As an instructor at the college, my regular instructional assignment is teaching modularized math courses in the math lab of the upgrading department. During each semester, the department offers multiple sections of ABE-level, college preparation level, and general/business math courses to approximately 150-200 students. Several classes are offered in the math lab during each hour time slot. Students may stay for extra help in additional time slots, if space is available. Students work independently through the modules, both in the math lab and at home. During the 1999-2000 academic year, five instructors and three instructional assistants, some full and some part-time, worked with students on a one-on-one basis in the lab. The group of instructors and assistants working in the math lab is referred to as the math instructional group (MIG) of the upgrading department.

During my employment as a math instructor at the college, I observed that some students had difficulty learning math by reading a module and then completing practice exercises on their own. Often students were unable to complete a math course in a regular 13-week semester using this approach. I also observed that a number of students had difficulty each semester meeting the recommended time lines for completing each module and writing exams on the recommended test dates. I listened to students complain about how they disliked math when they attended public school, and how they disliked

math to this day. Often, they told me that they could not understand math when they were in school, and that math still made no sense to them. Some students complained that they expected to be in a classroom where an instructor taught them. They indicated that they preferred a regular classroom lecture to working on their own. Some students expressed a desire to work with other students. In contrast, others said they enjoyed working independently because this provided them with the opportunity to complete much of their course work outside the classroom. I observed that the students who enjoyed taking the modules home to work on them were often the same students who completed a course ahead of schedule, or who completed more than one course each semester.

The Problem

Although students completed evaluations of instructors' performances annually, no formal evaluation of the modularized math program had been completed. Therefore, in light of my observations and the students' informal feedback, I concluded that an evaluation of the modularized program, not just the instructors' performance, was important for decisions about the program. Initially, I was unsure how to suggest to the group of instructors and instructional assistants working in the math laboratory that such an evaluation be conducted. I was concerned that suggesting an evaluation of the modularized math program might imply that the program or modules were unsatisfactory. I did not want to offend those professionals who had written the modules or who had taught the courses for many years. Nevertheless, I began working collaboratively with the instructors and assistants who teach the modularized courses to focus an evaluation that would gather information useful to the group members for the improvement of the math

program; as they became involved with this process, the evaluation became more relevant and exciting to them. The evaluation we designed sought to answer four questions:

(a) What are the learning needs and styles of the students in ABE and academic upgrading math courses? (b) Does the current math program meet the needs of most of the students taking the courses? (c) Can students suggest changes to the program that might lead to improved student success and retention rates? (d) Do the course statistics reveal patterns of success or failure by grade level or by semester?

Purpose of the Study

During the fall of 1999 through the spring of 2000, I conducted a utilization-focused evaluation of the modularized math courses offered to ABE and other academic upgrading students. The evaluation was both formative and collaborative, extensively involving the math instructional group as the major stakeholders of the study results. The purpose of this study was twofold: (a) to obtain information which would determine if the math program for ABE and academic upgrading students, which utilized self-instructional modules, was meeting the needs of the students, and (b) to report on the process of involving the math instructional group members in the planning, development, and implementation of a utilization-focused, formative evaluation. This is a case study that may be of interest to math educators in other adult basic education programs who are similarly interested in the benefit of modularized versus classroom instruction.

As a member of the math instructional group, I wanted to conduct an evaluation study in my area of instruction that involved regular collaboration with the major stakeholders of the evaluation results. I hoped that a collaborative study might ensure that

the information and data gathered during the evaluation process would be useful to the staff members who taught in the math lab, and that the information might help them determine the future design and delivery of the modularized courses. I also hoped that the information gathered would address the assumptions, comments, and concerns expressed by both staff and students about the modularized math program and about the students taking modularized courses.

Because I believed student input was an important component of the evaluation process, I wanted to learn about students' perceptions of the math courses, their likes and dislikes, suggestions for improvement, and strategies for success. I also intended to gather the perceptions of the instructors and instructional assistants who taught the courses. The information gathered from the math instructional group included what the staff thought worked well or did not work well with the current method of delivery and materials, suggestions for change or improvement of the courses, and a description of the characteristics of successful and unsuccessful students. I also planned to record the history of the math laboratory as background to the study and the evaluation report, and to provide each staff member the opportunity to express their views confidentially.

There were a number of reasons why I chose to initiate a collaborative, utilization-focused evaluation study. Conducting an evaluation at my place of employment, from the initial step of determining the main stakeholders to the final stage of reporting the results, provided me with the opportunity to increase my knowledge of adult education theories and principles in an area relevant to me. I also had the opportunity to learn the methods and steps involved in conducting an evaluation, to improve my skills working collaboratively with a group in the college setting, and to

practice involving students in evaluating both the delivery method, and the materials used, in the courses in my instructional area. After the completion of the study, I continued to work collaboratively with the group to decide if, and how, the information gained from the evaluation would be used. The evaluation study gave me the opportunity to practice incorporating several adult learning principles, including safety, relationships, team work, and immediacy, into my work. The study also provided me with the opportunity to improve my understanding of, and practice in, the teaching of ABE and high school level math courses to adult students. Finally, I anticipated that my experience with an evaluation study would be of use to the upgrading department in the future, and that I would have the opportunity to use my knowledge to facilitate formative evaluations of other courses offered by the department.

Scope and Limitations

The study is in the area of academic upgrading and ABE and involves the evaluation of the modularized math courses offered in a college-based ABE/academic upgrading program. The specific focus is on the planning and implementation of a collaborative, formative, utilization-focused evaluation. The study includes all but one of the courses offered by the upgrading department at a community college. College preparation math at the grade 12 equivalency level is delivered by lecture, and is therefore not included as part of this study.

The evaluation process was completed with the collaboration of seven math laboratory staff members, and with the input of 35 adult students who were registered in a modularized math course in the ABE/academic upgrading program. The data were both

qualitative and quantitative. I collected them using various methods including three student focus groups, questionnaires completed by each of the participating students prior to the group discussions, individual interviews with the seven staff members working in the math lab, and statistical data provided by the college registrar's office.

In the planning stages, the math instructional group met with me each month to make suggestions and recommendations, critique the draft of questions I had prepared, and make arrangements with students to trial test the questions and participate in the student focus groups. The full cooperation and collaboration of the math instructional group were essential for the planning, design, and implementation of the evaluation study.

The three focus groups were limited to a maximum of 15 students in order to facilitate discussion and accommodate meeting room size. The students participating in the focus groups were volunteers, and participation was limited primarily to those students whose schedules allowed them to attend a 1½ hour session over the lunch hour. The focus groups were scheduled on days that allowed the largest number of students to participate.

Two of the focus groups were composed of students continuing at the college in January 2000, who had successfully completed a fall semester math course no later than December 1999. The participants in the two continuing student focus groups were divided by math level, as much as possible. The first group of continuing students was composed primarily of students taking grades 11 and 12 high school equivalency level courses, whereas the second group was composed of students taking ABE and grade 10 high school equivalency-level courses.

The third focus group was composed of students who began taking a modularized math course in January 2000. The majority of the new students in this group were anticipated to be working at the ABE level. However, a mix of students, ranging in course level from ABE to grade 12 general equivalency, began college in January. This group met on two occasions, 2 months apart, in order to provide follow-up data.

Of the 35 students who participated in the groups, 21 students were female and 14 were male. The students ranged in age from late teens to late 30s. The skill level of the students who participated in the focus groups ranged from a grade 6 ABE level to a grade 12-college preparatory level.

The selection of participants in the focus groups was based on their lunch-hour availability, which limited the quantity of data collected. Conducting the evaluation at the start of the winter semester eliminated the participation of some of the students who had been unsuccessful in a fall semester math course and who consequently did not return to the college to take a course in the winter semester. This may have also affected the quality of the data gathered. Unsuccessful students do not complete courses for a variety of reasons, one of which could be dissatisfaction with the mode of delivery of the math courses. As well, the small quantity of new students available to participate in the new student follow-up focus group limited the discussions and suggestions forthcoming from that group.

Resources

Because the evaluation study was part of my Master of Adult Education Program, additional monetary resources were not available from the college to cover evaluation expenses. However, as a college instructor on educational leave for the year, I had free access to the college library, data from the registrar's office, college classrooms, photocopying, and administrative assistance for miscellaneous tasks such as booking rooms and locating supplies for the group sessions. A local restaurant donated food and drinks for the lunchtime student focus groups.

Assumptions

I made several assumptions during the development of this study. First, I assumed that instructors and instructional assistants want to do the best job they can to help students succeed in meeting their goals. Second, I assumed that instructors and assistants want to receive information about the courses that they teach, provided that the information is useful to them and may help them make course improvements. Third, I assumed that the math instructional group would want some level of involvement in the design and implementation of an evaluation of the courses they were instructing. Fourth, I assumed that students would be able to provide useful information about their learning preferences, their likes and dislikes, and how the courses could be improved.

Definitions of Terms

Several terms that I use in my study vary in meaning at other institutions, and are therefore clarified in this section.

Adult basic education (ABE) refers to basic skills courses in reading, writing, and math that are above a basic literacy level and up to a grade 9 level.

Academic upgrading refers to those courses or programs offered at approximately grade 10 to 12 equivalency levels to adults wishing to further their skills and prepare for further education or training. Academic upgrading courses or programs are also referred to as college preparatory or high school equivalency courses or programs.

Formative evaluations are conducted to gather information that will be used to improve or enhance programs. They are often conducted when the program is in progress, as opposed to at the end of the program.

Modularized math refers to the offering of a math course through the use of modules, or learning packages, which “provide a formal outline of the skills that...have to be demonstrated” (MacLeod, 1996, p. 206). The modularized math curriculum is “driven by objectives.... Individual learners are expected to work alone in acquiring the skills and knowledge necessary to pass the examination” (MacKeracher, 1994, p. 278).

Individualized learning refers to the learning process in which an instructor or instructional assistant provides students with learning materials that are divided into competencies. The competencies must be learned in order to demonstrate competence by passing an examination. Once competence is demonstrated, students move on to the next level or topic. The student works on his or her own, studying descriptive material and examples, and then completing and self-correcting practice exercises. Individual

instruction and assistance is provided in the classroom when a student requests it, or when the instructors or instructional assistants observe that a student is experiencing difficulty. Students in individualized instruction may complete the material faster or slower than the suggested timelines.

Utilization-focused evaluation is an approach to program assessment that focuses on how the results of the evaluation will be used throughout each step of the evaluation process. In utilization-focused evaluation, the primary intended users of the evaluation results are identified at the beginning of the evaluation process and they are encouraged to be actively involved in the decision-making about the evaluation throughout the process (Patton, 1997).

Plan of Presentation

In the next chapter, I review the literature on adult learning, planning and evaluation, developmental programs such as ABE and academic upgrading in community colleges in Canada, and math instruction to students in developmental programs. These topics provide a theoretical background to the study.

In the third chapter, I present a description of the study. First, I describe the preliminary planning activities. Second, I describe how the evaluation was conducted and data were gathered. I describe the staff interviews and each of the three student focus groups, and summarize the gathered data. I then summarize the data provided by the college registrar's office and some of the conclusions drawn from that data. Finally, I describe the process of organizing the gathered information, writing the evaluation report, and sharing the evaluation information with the instructional staff.

In the last chapter I discuss the evaluation process, the usefulness of utilization-focused evaluation, and my assessment of the value and impact of the evaluation on my learning and on the college. I also offer conclusions and recommendations for other adult educators.

CHAPTER 2

LITERATURE REVIEW

In this chapter, I review some of the applicable literature on adult learning, focusing on program planning and evaluation, and developmental programs at community colleges, in order to establish the theoretical framework for the study. I divide the chapter into four major sections. In the first section, I explore some of the literature on adult learning. In the second section, I discuss some of the literature on program planning, with an emphasis on evaluation as one of the steps in the program planning process. In the third section, I discuss utilization-focused evaluation as a method of assessment that focuses on the use of the evaluation results. In the final section, I review the role of remedial and developmental education programs such as ABE and academic upgrading in community colleges, strategies for improving retention and learner success in these programs, and some of the recent research on mathematics education for adult students in developmental programs.

Ideas From Adult Learning

Some ideas from adult learning that are important within the framework of this study are self-directed learning and the role of the adult educator in the adult learning process.

Self-Directed Learning

The concept of the self-directed learner was advanced through a study conducted by Houle (1988) in which he interviewed adult learners and classified them into groups according to the reasons why they participated in learning. He found that adults

participated in learning activities for one of three reasons: they were goal-oriented and had a specific end goal to achieve; they were activity-oriented and participated in learning activities for social reasons; or they were learning-oriented and perceived learning as an end in itself.

The concept of the self-directed learner influenced many adult educators, including Knowles (1980). Knowles incorporated the idea that adult education is the “process of facilitating self-directed learning” (p. 49) into his ideas on andragogy. Because Knowles published his works on andragogy, or the “art and science of helping adults learn” (p. 43), adult educators have tried to define self-direction. The literature demonstrates how their definitions conflict. Some adult educators define self-directed learning as a process that can be taught. Other adult educators define self-direction as a quality or skill possessed by some individuals.

Chovanec (1998) argues that adult educators tend to define self direction as either a process of learning, a desirable personality trait, or both, and that many adult educators “have simultaneously held the conflicting beliefs that adults are naturally self-directing and that self-direction is a goal of adult education” (p. 310). Although process definitions focus on the individual learner, institutional realities force the process to be more focused on “institutional requirements such as curriculum, grading, methods and teacher skills rather than on the learners themselves” (Chovanec, p. 302).

Hiemstra (1994) believes that individual learners can be empowered to take responsibility for their learning and that, in each learning situation, everyone has the capability of self-direction to some degree. He suggests that many resources and activities can be involved in self-directed study, that teachers can have effective roles in

the self-directed learning process, and that self-direction does not mean that learning takes place in isolation from others. Hiemstra's findings support the current practice in some adult education programs of encouraging adults to learn independently through the use of modules, computer managed learning, and other types of independent instruction. The many methods of independent instruction, including modularized learning, are based on the assumption that self-directed learning is a naturally occurring human trait, a view that is challenged in some of the literature.

According to MacKeracher (1996), self-direction is both a characteristic of adult learners and an approach to learning. In MacKeracher's view, self direction can be understood in three ways: as an innate characteristic one is born with; as an acquired quality which develops with age; and/or as a characteristic which can be learned and encouraged through educational activities. Several other examples of the literature also support that adults can be encouraged, and taught, to be more self-directed. Grow (1991) believes that "the goal of the educational process is to produce self-directed, lifelong learners" (p. 127). He developed a staged self-directed learning model based on the premise that "readiness is situational and it may even be task specific"(p. 126). MacKeracher concurs that "a learner may be self-directed in one context but paralyzed in another" (p. 55).

Good teaching, according to Grow (1991), "matches the learner's stage of self-direction and helps the learner advance toward greater self-direction" (p. 125). Chovanec (1998) similarly agrees that some self-directed learning skills can be taught:

Competency-based instruction, study skills sessions, time management seminars and assertiveness training may fall into the category of self-directed learning skills that can be identified and targeted for instruction. This involves taking into

account the themes of learning styles and/or situations and developmental progression. (pp. 308-309)

Despite the continuing debate in the adult education field over the definition of self-direction, self-direction is generally acknowledged as a characteristic of optimal adult learning, whether or not all adult learners have fully attained this characteristic. Grow (1991) and Wlodkowski (1999) point out that not all learners are ready to be self-directed, and that a mismatch between the learner's style and that of the facilitator can be problematic. Wlodkowski cautions that not all learners will respond well to a self-directed learning environment or to independent learning. He believes that as an instructional approach, "self-directed learning may need to be more often negotiated as an option than mandated" (p. 11).

The Role of the Adult Educator in Adult Learning

The role the adult educator plays in the adult learning process varies with the type and purpose of an adult education program, and with the philosophical orientation of those delivering the program. According to Knowles (1980), the role of the adult educator has evolved from that of "transmitting knowledge to them, telling them what they ought to know, or at best enticing them to learn" (p. 37) to being a change agent who performs helping roles. Knowles states that the function of adult educators "has moved increasingly away from being remedial toward being developmental—toward helping their clients achieve full potential" (p. 37). Cross (1981) also supports the idea that the development of the learner is the main role of the adult educator. In her view, the single most important goal of adult education should be for educators at all levels to address "the development of lifelong learners who possess the basic skills for learning plus the motivation to pursue a variety of learning interests throughout their lives" (p. 249).

MacKeracher (1996) proposes that the role of the adult educator is that of a facilitator of learning whose main function is to remove obstacles and disincentives to learning and to “enhance learning by adding positive external conditions which encourage, influence, and reinforce learning” (p. 6). Whereas MacKeracher believes that removing obstacles to learning is the basic function of adult educators, Wlodkowski (1999) believes that as facilitators of adult learning, adult educators are responsible for finding ways to structure learning activities that will motivate the diverse students in their programs. Wlodkowski suggests that “motivation is important not only because it apparently improves learning but also because it mediates learning and is a consequence of learning as well” (p. 5).

Some of the recent literature advocates that adult educators work with students for the purpose of social change and liberation from their current societal roles. For example, Alexander (1997) encourages adult educators to work towards social change and to “work to prevent today’s practice from serving a middle-class ghetto” (p. 209). Briton (1996) similarly suggests that adult educators assume a role of social change agent by engaging students in dialogue, making them aware of the forces that deny them the right to be responsible decision-makers, engaging them in democratic practices, and encouraging the development of their communication and critiquing abilities.

The role the adult educator plays in the learning process is closely related to the attitude of the facilitator and the style that the facilitator uses to facilitate learning.

Knowles (1980) has strong beliefs that the behavior of the facilitator

probably influences the character of the learning climate more than any other single factor.... Teachers convey in many ways whether their attitude is one of interest in and respect for the students or whether they see the students essentially as receiving sets for transmissions of wisdom. (p. 47)

Knox (1986) similarly believes that for “instructors whose aim is to empower participants with the desire and ability to guide their continued learning beyond the program, instructional mastery and style are intertwined components of the teaching/learning transaction” (p. 40).

The approach of the adult educator to working with learners can be characterized as primarily either learner-centered or teacher-centered. In the learner-centered approach, “the learning process is assumed to be paramount, while facilitating is regarded as a responsive activity adapting to the learner’s activities and natural learning process” (MacKeracher, 1996, p. 3). In the teacher-centered approach, the facilitator is the source of the learning activities, and the learners are expected to demonstrate to the facilitator the competencies they have acquired (Grow, 1991; MacKeracher).

MacKeracher (1996) believes that although adult educators have different styles and approaches to learning, a variety of styles are needed to meet the diverse needs and styles of learners. She states, “All approaches to learners and learning are useful in some contexts, with some learners, and for some content. Decisions about facilitating activities, content, resources, and technologies must be the focus of the planning which precedes any learning-facilitating interaction” (p. 3). Good planning of programs and activities can greatly facilitate the learning process and ensure that both the needs of the institution delivering the program, and the needs of the individual learners in the programs, are met to the best degree possible.

Program Planning and Evaluation in Adult Education

The literature on program planning and evaluation in adult education contains both similar and diverse views about the program planning and evaluation processes. In this section, I first provide an overview of some of the program planning models in the literature and address evaluation as a step in the program planning process. Second, I provide an overview of some of the methods and models of evaluation, including the naturalistic approach and stakeholder-based evaluations. Finally, I discuss utilization-focused evaluation, including the use of the evaluation results, the assumptions of utilization-focused evaluation, and the flow of the utilization-focused evaluation process.

An Overview of Some Program Planning Models

Most program planning models address the relationship between change and program planning and evaluation. Boyle (1981) believes that adult education programming “is done to bring about some change in individuals and/or the social system of which they are part” (p. 36). Knowles (1980) urges that in the program planning process “an institution’s general purposes as regards adult education be continuously tested against changing needs as an integral part of the ongoing program-development process” (p. 121).

Many program-planning models in the literature share a number of common steps or stages. For example, Houle (1972) proposes a two-part system of program planning. Houle’s system requires first examining the context of the learning situation to determine the source of authority and direction for the planning and control of the learning, and then applying this knowledge to seven basic steps in a program planning framework. The framework for planning consists of identifying the educational activity, making the

decision to proceed, identifying and refining objectives, designing a suitable format, fitting the format into larger patterns of life, putting the plan into effect, and measuring and appraising the results.

Boyle (1981) summarizes nine major stages of program planning: organizational and individual commitment, situational analysis, broad program objectives, identification of resources and support, program design, instructional design, action (events and activities), determining the program's value through evaluation, and the communication of the results of the evaluation to the stakeholders. Knowles (1980) proposes that there are three sources of needs and interests that should be considered in program planning: those of the individual learner, including both basic and educational needs; those of the institution; and those of the community or society. He also identifies seven basic decision points and components of program planning that are the same as those discussed by Houle (1972).

Caffarella (1994) presents an interactive model of program planning for adults, which consists of 11 components. Each component of the interactive model includes a set of tasks and decision points that may or may not need to be addressed in every planning situation. The components include the initial planning and identification of needs, the development of objectives to ensure the transfer of learning, the development of the operational plans including budget and facilities, the formulation of plans for the evaluation of the program, and the communication of the value of the program to the stakeholders. Caffarella bases her interactive model on six assumptions: educational programs should focus on the learners and how the learning will result in changes; program planning involves both systematic and planned tasks as well as last-minute

decisions; the development of educational programs is a complex interaction of institutional priorities, tasks, and people; developing educational programs is a cooperative endeavor; designing educational programs is a practical art; and individuals can learn to be more effective program planners through practice.

Vella (1994) offers a flexible, seven-step planning process similar to the steps used in Caffarella's (1994) model. In Vella's model, the seven phases of the planning process are summarized by answering the questions who, why, when, where, what for, what, and how. The process is informed by 12 principles of effective adult learning and begins with the learners being the subjects of the process. Similarly, Knox (1986) values flexibility within a structured approach to planning educational programs for adults:

The starting point could be intended outcomes, learning activities, educational needs, organizational expectations, or evaluation results the last time the program occurred. It doesn't make much difference as long as you touch on all of them early, because they are so interrelated. (p. 54)

Knox also believes that "in the process of helping adults learn, program planning and implementation should blend together" (p. 54).

Many models of planning exist today. Although different labels may be given to the different steps or stages of the planning process, most models are based on the assumption that program planning should be conducted with the needs of the learner and the organization in mind. Caffarella (1994) summarizes the importance of focusing on these needs when she states, "The attention paid to the learner and/or organizational needs [should be considered] as central to the program planning process" (p. 17).

Evaluation as a Stage of the Program Planning Process

Evaluation of the program is one of the common stages of program planning. There are several different reasons for conducting an evaluation and, consequently, the

purpose of the evaluation needs to be clarified before the process begins. The purpose of the evaluation may be to make a judgement about the program's effectiveness, or it may be to collect information which will primarily be used for program improvement (Patton, 1997; Scriven, 1991).

Chelimsky (1997) explains that some of the unsettled issues surrounding evaluation may be the result of the failure of researchers and evaluators to recognize that there are three reasons to conduct an evaluation: accountability, development and improvement, and knowledge creation. Each of these perspectives on evaluation has a different focus, and what is relevant for one perspective may not be appropriate for the other perspectives. For example, an accountability focus generally results in judgements about a program that may be of interest to administrators and sponsoring agencies. In contrast, a focus on program development and improvement often results in the use of the information by the program staff to implement improvements to a long-term program. Chelimsky advocates that evaluators be more open-minded and consider the many methods, models and uses for evaluation today. Evaluators, she says, should be more "inclusive—that is, to welcome prospective as well as retrospective studies, to use quantitative as well as qualitative methods, to develop cross-disciplinary linkages, and to create channels for the effective dissemination of evaluation findings" (p. 25).

Some researchers propose evaluation as a separate component in the program planning process that is left to the end of a series of steps in the process. Others suggest that evaluation should be integrated into the planning process from the beginning of the process, or should be conducted on an ongoing basis. Some of the issues still debated in the literature include the process of the evaluation itself and what is learned throughout

the process, the inclusion and role of the stakeholders in the evaluation, the role the evaluator plays in the evaluation process, the purpose of the evaluation, and the use of the information acquired during an evaluation (Guba & Lincoln, 1983; Knox, 1986; Patton, 1997).

Evaluation of adult education programs can be a challenge because of the political nature of the evaluation process and the cost involved in terms of money, time, and energy (Herman, 1993). However, evaluation can serve many useful purposes, including “program planning, policy-making, program improvement, or program justification or accountability” (Grotelueschen, Gooler, Knox, Kemmis, Dowdy & Brophy, 1974, p. 18). Chelimsky (1997) adds that among the purposes for evaluation are “to measure and account for the results of public policies and programs; [and] to determine the efficiency of programs, projects, and their component processes” (p. 9). Another reason to evaluate, according to Gosling (1995), is to collect information that may be used by program staff in several ways: “to get a wider understanding of the context of their work; to understand the objectives more clearly; [and] to determine how well they are implementing activities” (p. 17).

The literature frequently refers to determining the worth of a program as the main reason for program evaluation. Caffarella (1994), for example, believes that “the heart of program evaluation is judging the value or worth of an educational program” (p. 120). When evaluations are conducted to judge the value or the worth of a program, they are called summative evaluations. According to Patton (1997), “summative evaluations judge the overall effectiveness of a program and are particularly important in making decisions about continuing or terminating an experimental program or demonstration project. As

such, summative evaluations are often requested by funders” (p. 67). Scriven (1991)

clarifies that a summative evaluation

is conducted *after* completion of the program...and *for* the benefit of some *external* audience or decision-maker...though it may be *done* by either **internal** or **external** evaluators or a mixture...For reasons of credibility, summative evaluation is much more likely to involve external evaluators than is a formative evaluation. (p. 340)

Johnston (1992) agrees that “most summative evaluation comes at the end, is therefore retrospective, and by definition can not help the people who completed it” (p. 71).

Evaluations conducted to gather information that will be used to improve or enhance programs are called formative evaluations. Knox (1986) states that “the emphasis in formative evaluation is on use of conclusions by people associated with the program (instructor, participants, supervisor) to improve the ongoing process” (p. 180). Patton (1997) agrees that formative and other improvement-focused evaluations are a way to gather data “about strengths and weaknesses with the expectation that both will be found and each can be used to inform an ongoing cycle of reflection and innovation” (p. 68). Scriven (1991) clarifies that formative evaluation is “typically conducted *during* the development or improvement of a program...and it is conducted, often more than once, *for* the in-house staff of the program *with the intent to improve*” (pp. 168-169). He states that an internal or external evaluator, or a combination of the two, may complete the evaluation. In Johnston’s (1992) view, formative evaluation is an important tool for the improvement of practice, and the participants in an evaluation learn a great deal from the evaluation process itself.

Whether the evaluation is a formal or informal one or is conducted by an internal or external evaluator may have an effect on the use of the evaluation results. Knowles

(1980) believes that “informal evaluation is actually going on all the time...but it does not serve the same purpose as periodic, systematically planned evaluation” (p. 203).

Knox (1986) agrees that formal evaluation is valuable and that program evaluation should be formalized as part of the program-planning process. Formalizing the evaluation provides more accurate descriptions, makes sounder judgements, and communicates “findings in ways that encourage people associated with the program to use those findings for decisions on program planning, improvement, and justification” (p. 165).

Naturalistic and Stakeholder-Based Evaluations

Alternative methods of evaluation, differing from the traditional scientific approach to evaluation and research, have evolved over the years. One of the alternative approaches to inquiry and evaluation is the naturalistic approach. According to Guba (1978), the ideal naturalistic inquiry should have a low degree of imposition of constraints on antecedent variables as well as a low degree of imposition of constraints on possible outputs. Guba and Lincoln (1983) differentiate between naturalistic and scientific inquiry, stating that “the extreme of scientific inquiry, commonly called experimentation, severely constrains both antecedent conditions and output factors, while the extreme of naturalistic inquiry constrains neither” (p. 83).

Although the scientific paradigm is based on identifying the independent and dependent variables of interest, eliminating possible confounding variables through laboratory controls, randomizing the selection of subjects to treatments, and comparing the effects, the naturalistic investigator or evaluator immerses himself or herself in the investigation with an open mind, allows impressions to emerge, and uses a process of description and understanding. Rather than a laboratory setting, naturalistic inquiry is

carried out in a natural, non-contrived environment, and the inquirer makes every effort to understand contextual factors and their relationship to the elements being studied (Guba, 1978). Guba views the investigator in a naturalistic inquiry as more of an observer than a director of the investigative process. Guba believes that evaluation should incorporate both description and judgment, and that naturalistic evaluation is a better method of determining the value of an entity than is the use of scientific methods. In Guba and Lincoln's (1983) view, naturalistic inquiry lends itself to evaluation and can offer more in the complex area of human relations than can scientific inquiry. Guba and Lincoln also argue that the investigators themselves are changed through interacting with the subjects of the investigation.

Stakeholder-based evaluations have evolved over the years in response to two factors: the use of naturalistic inquiry in evaluations involving the human factor, and the concerns expressed about the lack of use of evaluation results. Stakeholder-based evaluations involve those individuals who have "substantial ego, credibility, power, futures, or other capital invested in the program, and thus can be held to be to some degree at risk with it" (Scriven, 1991, p. 334). There are a number of evaluation models that involve stakeholders to some degree. Responsive evaluation is one of the earlier evaluation models involving stakeholders. Guba and Lincoln (1983) define responsive evaluation as "an emergent form of evaluation that takes as its organizer the *concerns and issues of stakeholding audiences*" (p. 23). They clarify the importance of including the concerns of the stakeholder:

Responsive evaluation produces information that audiences want and need....If evaluation results are rarely used, it is because those results are rarely relevant to local needs....In the final analysis audiences will use information that they themselves have suggested to be important. (p. 38)

In later research, Guba and Lincoln (1989) propose a model of evaluation that they name fourth generation evaluation. They describe their model as “a marriage of responsive focusing—using the claims, concerns, and issues of stakeholders as the organizing elements—and constructivist methodology—aiming to develop judgmental consensus among stakeholders who earlier held different, perhaps conflicting... constructions” (p. 184).

Cousins and Whitmore (1998) compare a number of more recent stakeholder-based evaluation models. They situate participatory evaluations among other forms of collaborative evaluation and note that the term participatory evaluation is being used more often as a descriptor of stakeholder-based, collaborative work. According to Cousins and Whitmore, a participatory evaluation implies that “when doing an evaluation, researchers, facilitators, or professional evaluators collaborate in some way with individuals, groups, or communities who have a decided stake in the program, development project, or other entity being evaluated” (p. 5). They emphasize that participatory evaluation has “as its central function the fostering of evaluation use” (p. 6), which is also the driving force in utilization-focused evaluation. The inclusion of stakeholders in the evaluation process in both of these evaluation models is seen as a way to ensure that the evaluation results will be used.

Utilization-Focused Evaluation

In utilization-focused evaluation, the focus of the process from beginning to end is on the use of the evaluation results. In this section, I first discuss some of the literature involved in the debates about the use of evaluation results. In the second section, I

summarize the basic assumptions of utilization-focused evaluation. In the third section, I discuss the five major stages of planning and conducting a utilization-focused evaluation.

Use of Evaluation Results

Although evaluation has been part of the program planning process for many years, much of the literature continues to address how to make use of the information collected during the evaluation process. Guba and Lincoln (1983) express dismay at the lack of use of evaluation findings:

Such failure [to use the findings] simply illustrates the poverty of traditional evaluations, which are likely to fail precisely because they do not begin with the concerns and issues of their actual audiences and because they produce information that, while perhaps statistically significant, does not generate truly worthwhile knowledge. (p. ix)

Similarly, Knox (1986) acknowledges a problem with the lack of action resulting from the evaluation of adult education programs. He suggests that “effective evaluation should be part of each component of planning and of all aspects of the teaching/learning transaction” (p. 164). Johnston (1992) agrees that evaluation should be tied into the planning and learning process. In her view, “Evaluation is not a free standing activity but is part of a process of continuing curriculum development and even of educational development generally” (p. 73). Herman (1993) criticizes the classic models of planning because they always end with evaluation. He proposes a program planning model which “seeks to turn planning outside in, [and] to bring the planning of evaluation in from the cold and join it to the goals and objectives” (pp. 171-172) of the program.

Although much of the current literature focuses on the utilization of evaluation results, some researchers do not agree that focusing solely on results is the best way to conduct an evaluation. Scriven (1991) believes that “the legitimate reaction is to make

sure that considerations of utilization/implementation are planned into evaluations from the first moment, just as evaluability should be planned into programs” (p. 369). Scriven cautions, however, that there can be problems with a conflict of interest arising from focusing too much on the use of evaluation results. He explains that such a focus places pressure on the evaluators to report findings that speak to what the decision-makers are willing to do, rather than what they should do. Chelimsky (1997) similarly expresses concerns for focusing too strongly on the usage of evaluation results:

The purpose of an evaluation conditions the use that can be expected of it; use is integrally a part only of developmental evaluation....Justifying all evaluations by any kind of use may be overly limiting and restrictive for nondevelopmental evaluations. (p. 18)

Chelimsky (1997) also argues for the evaluation process being important in its own right because “although *findings* are not used, things change anyway because an evaluation is anticipated” (p. 16).

Patton (1997) agrees that the evaluation process itself is useful and can be a learning experience for those involved. However, he strongly advocates for utilization-focused evaluation, a form of evaluation that focuses on the use of the results throughout the entire evaluation process. Patton views the use of utilization-focused evaluation as a means of narrowing the gap between generating evaluation information and using the evaluation information to make program decisions and improvements.

Assumptions of Utilization-Focused Evaluation

Patton (1997) bases utilization-focused evaluation on 14 primary assumptions. First, he believes that commitment to the intended use of the evaluation results should be the driving force in an evaluation, and that consideration of the use of the evaluation results should be ongoing and continuous from the start of the evaluation process. He also

assumes that the personal interests and commitments of those involved in the evaluation will determine if and how the results are used, and that considering the many interests surrounding the program will help to identify the primary intended users of the results. According to Patton, actively involving the primary intended users in the decision making about the evaluation will increase their commitment to using the results.

Patton (1997) further assumes that focusing on the use of the results is the most useful way to focus an evaluation, and that deliberate and thoughtful choices are required throughout the evaluation in order to keep the focus on the intended use of the results. Each evaluation must be designed and adapted to fit the situation if it is to be useful. Patton also assumes that the goal of utilization-focused evaluation is high-quality participation of the stakeholders, and that high-quality evaluations are the results of high-quality stakeholder involvement.

Patton (1997) also makes several assumptions about the role that the evaluator must play in a utilization-focused evaluation. He assumes that evaluators must be active-reactive-adaptive during each evaluation, listening to the intended users and responding to each new situation in an appropriate way. In utilization-focused evaluation, the evaluator may be an internal colleague or an external expert, a collaborator or a group trainer, a change agent or a creative consultant. By working collaboratively with a stakeholder group that represents all the many interests around the evaluation, the evaluator should be able to present both positive and negative information so that the stakeholder group can make informed choices.

Patton further believes that evaluators should train the intended users of the evaluation results in evaluation processes and uses of information in order to increase

their commitment to use the results. He emphasizes that the use of the results is not the same as reporting and disseminating the evaluation information. Finally, he assumes that there may be substantial costs associated with following through with the use of evaluation results.

The Flow of the Utilization-Focused Evaluation Process

As with most evaluation models, the flow of the utilization-focused evaluation process can be charted, and each step described individually. In reality, however, the process is seldom linear. Patton (1997) cautions that applying the steps logically in any evaluation will require flexibility and creativity, and the “active-reactive-adaptive evaluator who is situationally responsive and politically sensitive may find that new stakeholders become important or new questions emerge in the midst of methods decisions” (p. 380).

According to Patton (1997), the identification of primary stakeholders and users of evaluation information is one of the keys to the utilization-focused evaluation process, as well as the first stage of the process. Patton’s research indicates that the personal factor, along with the political factor, are two key factors which indicate the extent to which evaluation results will or will not be used. In Patton’s view, the personal factor includes the leadership, interest, commitment, and caring of individuals who are the primary users of the evaluation results. Patton cautions that if this personal factor is absent, the use of the evaluation information will be drastically reduced.

Once the primary stakeholders have been identified, the second stage is for the evaluator and the intended users to commit to how the evaluation results will be used, and to focus the evaluation and determine the relevant questions. This is “an interactive

process between evaluators and the primary intended users of the evaluation” (Patton, 1997, p. 189). Patton suggests several criteria for each utilization-focused evaluation question: that data can be brought to bear on the question, that there is more than one possible answer to the question, that the intended users want information to help answer the question, that the intended users want the information for themselves, and that the intended users know how they will use the answer to the question. He also suggests identifying the primary purpose of the evaluation as an initial step that will bring focus to what questions should be asked and how the gathered information will be used. Different types of evaluations may need to be discussed at this time.

The third stage of the evaluation process involves making decisions about the methods, measurement, and design of the evaluation and data collection instruments. Patton (1997) suggests that a variety of options be considered, including qualitative and quantitative data and naturalistic and experimental designs. Methods should be considered as to their appropriateness, believability of the data, understandability, and costs. All of these decisions are made with the stakeholder group, keeping the use of the information in mind at all times. Patton explains this process further:

In utilization-focused evaluation, the researcher has no intrinsic rights to unilaterally make critical design and data collection decisions....It is crucial that intended users participate in the making of measurement and methods decisions so that they understand the strengths and weaknesses of the data—and so that they believe in the data. (p. 180)

The fourth stage of the utilization-focused evaluation process begins after data have been gathered. The intended users are then actively involved in analyzing and interpreting the data, and in making the resultant recommendations. This stage of the evaluation process also includes summarizing what has been learned and writing the

evaluation report. Patton (1997) explains that in utilization-focused evaluations, “intended users are actively and directly involved in interpreting findings, making judgments based on the data, and generating recommendations” (p. 380). He recommends that the nature and content of the evaluation report be negotiated with stakeholders and evaluation funders early in the evaluation, and that the “recommendations should clearly follow from and be supported by the evaluation findings” (p. 325).

The final stage of the utilization-focused evaluation process involves making decisions about the dissemination of the evaluation report. According to Patton (1997), this step “reinforces the distinction between intended use by intended users (planned utilization) and more general dissemination for broad public accountability (where both hoped for and unintended uses may occur)” (p. 380).

The five major stages of utilization-focused evaluation could be integrated into the program planning and evaluation processes utilized in most institutions providing adult education programs. Community colleges are one type of institution offering adult education programs, including developmental programs such as ABE and academic upgrading. Planning and evaluation are conducted both formally and informally in community colleges in an effort to meet both the needs of the learners and the needs of the institutions.

ABE, Academic Upgrading, and Developmental Programs

In this section, I first discuss the nature and challenges of community colleges in Canada. Second, I discuss the role developmental programs play in community colleges, and some of the objectives of these programs. Third, I address retention concerns in ABE

and academic upgrading programs, and describe a number of success strategies for adult educators to use when working with students in developmental programs. Fourth, I discuss the use of individualized learning in developmental programs. Finally, I discuss some of the research on math instruction to adult students in developmental programs.

Nature and Challenges of Community Colleges

Provincial legislation established community colleges in Canada in the 1960s and 1970s in order to provide expanded learning opportunities previously not available to adults at other postsecondary institutions. Dennison and Gallagher (1986) classify the expanded learning opportunities offered at community colleges into eight categories of curriculum: vocational and trades training, apprenticeship training, career and technical training, university transfer programs, general academic programs, personal interest and community development programs, pre-college level or upgrading programs or basic skills training, and contract programs. Merriam and Brockett (1997) also speak to the variety of offerings at community colleges, noting that each community college may offer a variety of programs including “credit programs to prepare adults for careers and career changes...and a basic education program for adults in the community who want skills training” (p. 119).

Because of the variety of programs offered at public colleges, they attracted a much more heterogeneous group of students than those previously attending other institutions of higher education (Dennison and Gallagher, 1986). Dennison and Gallagher note that among the early individuals to attend community colleges were middle class, secondary school graduates who did not have sufficient academic achievement to be

admitted to university. The trend for adults to enter college to upgrade their academic skills has continued to this day.

Owen (1986) points out that culture, politics, and finances are all part of the complexity of community colleges, and that the pressures of ongoing financial restraint and other indirect pressures will continue to plague community colleges for some time. Since the 1980s, there has been a trend to reduce the amount of funding to community colleges and to expect colleges to seek alternate funding sources (Dennison, 1986). Similarly, Merriam and Brockett (1997) note that “the financial health of the adult education unit within the larger organization is often driven by an enrollment economy—that is, funding is tied to the number of adults enrolled” (p. 110).

Another challenge for community colleges is to focus more on student success, and not on access alone (Gallagher, 1986). Gallagher believes strongly that colleges do not help their applicants if they accept them into programs in which they have little chance of success. Likewise, Dennison (1986) agrees that one of the major challenges facing colleges today is promoting student success. He observes that “numerous social groups, multicultural organizations, immigrants, First Nations peoples, individuals on social assistance and the physically and mentally disadvantaged continue to challenge colleges to provide programs tailored to their unique backgrounds and specific needs” (pp. 278-279). The developmental and remedial programs offered at community colleges may help to meet some of these student needs.

Developmental and Remedial Programs in Community Colleges

Developmental and remedial programs, including academic upgrading, basic skills training, and adult basic education (ABE) programs, were established at colleges to

meet the needs of those adults whose skill levels were below a high school graduate level. Dennison and Gallagher (1986) explain that these programs of pre-college level studies were for students who “had the interest in, and aptitude for, the various programmes offered by these colleges, but who did not have the academic background to pursue them effectively or confidently” (p. 72).

Dennison (1986) addresses the challenge faced by community colleges of promoting success for the learners in developmental programs:

Many who enrol in college programs are single parents, long-unemployed, disillusioned, frustrated with barriers to progress, financially impoverished, and/or otherwise disadvantaged. All of these conditions affect their ability to learn and magnify the challenges they face. College...[support services] are neither qualified nor equipped to deal with the complex problems which bear upon student performance in courses and programs. (pp. 279-280)

Although students in developmental programs offer a challenge to community colleges, they often represent a significant percentage of the overall student population. Dennison and Gallagher (1986) suggest that community colleges serving large communities would be wise to offer a range of programming, including the “essential categories of...basic education, transfer education, general education, career education, vocational education, and community education” (p. 152). Programs such as adult basic education, academic upgrading, and other basic skills and developmental programs meet a variety of community needs.

Objectives of ABE, Academic Upgrading, and Other Developmental Programs

Educators in developmental programs such as ABE and academic upgrading may hold differing views on the objectives of the programs. Some educators believe that developmental programs should prepare the learners for the labor market. Clague (1972) suggests that the emphasis should be on learners who have had the least prior opportunity

to participate in formal learning. He believes that the goals of basic skills programs should be to “equip the disadvantaged with the skills to compete effectively in the labour market, and to provide the stimulus and resources for self-directed learning that can lead to a wider choice of life styles” (p. 44).

Cross (1981) notes that efforts to reach the poorly educated are often through competency-based programs such as job training or basic skills courses. She cautions that these courses can be threatening to some students, who may have the perception that whoever evaluates them in the program “has considerable power to influence the type of job they get or whether they get a job” (p. 135).

Kulick (1972) suggests that the ABE and literacy programs which are successful are those programs that “are based on the total involvement of the teacher and the learner in their social milieu, programmes which integrate ABE with economic and social problem-solving” (p. 8). Clague (1972) likewise believes that “the strength of ABE lies in its concern for the whole man [sic] and his community” (p. 25).

Despite some differences in opinion, adult educators generally agree that the objectives of ABE, academic upgrading, and other developmental programs should include the preparation of learners for the labor market, the development of self-direction in individuals in order that they may expand their life choices, and the involvement of the whole person in their community.

Retention Concerns and Success Strategies in ABE and Upgrading Programs

Despite a lengthy history, student success and retention remain current issues for ABE, basic skills, and academic upgrading programs. Educators working in these developmental programs are challenged with identifying and addressing student

problems, including how to improve low retention rates, how to make accurate initial assessments and placements of the learners, and how to help learners sustain their motivation and attain success. A number of adult educators have researched these concerns and provide strategies to help other practitioners in the field improve the success of their learners (MacKeracher, 1996; Quigley, 1992; Wlodkowski, 1999).

Attrition rates in ABE and basic skills programs have been researched and reported to range up to 60 % or 70 % in some programs (Quigley, 1992). However, many educators are optimistic that instructors and teachers can improve their learners' success rates by utilizing the principles of adult learning. One of the principles to be considered is the influence of the learners' social and cultural backgrounds. According to Dickinson (1972), "an understanding of the adult learner as well as learning processes and principles are prerequisites crucial to effective ABE and such programmes must be even more carefully structured than adult education programmes for other groups" (p. 229).

Quigley (1997), in addressing the retention issue, suggests that "learner peers, program structures matched to individual student needs, and good matches with teachers may turn around an estimated third of the potential dropouts in the early weeks of programs" (p. 183). These strategies, along with other adult learning principles, result in providing a safe environment for the learner. Safety for the learner is seen by Vella (1994) as one of 12 principles for effective adult learning, and is one of several basic adult learning principles that may help to improve learner success.

Quigley (1992) suggests that the initial assessment of those at risk, coupled with frequent follow-up by teachers and counselors, is another way of improving student success in basic skills programs. Bergin and Johnson (1995) note that "the process of

assessment and definition of learning goals can be empowering and encouraging if it can be recognised that learning goes beyond the acquisition of a set of skills recognised by an accreditation system” (pp. 236-237). The placement of learners in the program is usually determined at initial assessment, and often only by a learner’s math and reading levels. Quigley (1997) argues that this kind of initial assessment is often inadequate and “if our aim is to stem attrition, matching the needs and goals of learners with program options and program strengths is more critical than identifying the knowledge that learners do not have” (p. 186).

Waite (1972) similarly believes the initial placement and the first few weeks of the learning experience are vital to keeping adult students in programs. She advocates alleviating the learner’s apprehensions at the start of the program because “later plans will not benefit the student who retreats from the course in its early stage. The ABE student needs an immediate taste of success....He [sic] needs a sense of being accepted and respected as a fellow adult” (p. 190).

Feng and Hian (1995) also suggest that initial assessment is extremely important when working with students for whom English is a second language. They note that assessment and placement with normed instruments can be problematic for these students in ABE and other developmental programs. Placement problems can occur when “using grade-level equivalents to provide a cut-off” (p. 91) and when other factors are not considered. Early identification of learners’ academic and personal needs, as well as early intervention with at-risk students, are critical to improving retention and success in developmental programs.

The reason why the learner is attending a program is an important motivational factor that will also affect the success of the student. Wlodkowski (1999) states that both social and historical influences can affect adults and their learning needs. He believes that “although most adults have multiple reasons for learning, social circumstances and the personal concerns that emanate from them are a dominant part of what brings most adults into group learning situations” (p. 15). Consequently, the more an adult educator can find out about why a student is attending a program, the more effectively the educator can work with the student.

As with other adult learners, students in developmental programs are more likely to succeed if their motivation for learning is strong. Wlodkowski (1999) believes that facilitators of adult learning can help their students stay motivated to learn. He provides 60 strategies for instructors to use to enhance the motivation of their adult learners. According to Wlodkowski, one of the most powerful motivators is the experience of success. When adults are successful in their learning, they are more likely to keep on learning. Wlodkowski acknowledges that other factors may also affect student success. He makes the point that “although motivation is a necessary condition for learning, there are other factors—ability and quality of instruction, for example—that are also necessary for learning to occur” (p. 5).

The need for adults to be involved in decision-making in their learning, as well as to be provided the opportunity for dialogue with their teachers and fellow learners, is also an adult learning principle that may contribute to student success (Knowles, 1980; MacKeracher, 1996; Vella, 1994). Wlodkowski (1999) agrees that choice, as well as success in learning activities, are important for all adult learners to experience in order

for them to sustain their motivation for learning. Similarly, Briton, Collett, Cooney, Deane, and Scott (1992) find that adults who have participated in their own learning plans from beginning to end “are more motivated to succeed” (p. 35).

Students’ past school experiences should also be considered when addressing the issue of retention and student success. Knowles (1980) contends that adults see themselves as a collection of their past experiences and derive their identities from these experiences. He states that “when they find themselves in situations in which their experience is not being used, or its worth is minimized, they feel it is not just their experience that is being rejected—they feel rejected as persons” (p. 50). Quigley (1992) suggests that when instructors deny students’ past life experiences, they may be ignoring life-long learning experiences that could help higher risk students succeed in their educational pursuits. MacKeracher (1996) summarizes a similar view:

Past experience structures the ways an adult will approach new experiences, determine what information will be selected for further attention and how it will be interpreted, and determine what knowledge (meaning and values) and skills (strategies, tactics and styles) will be employed first in the learning process.
(p. 36)

Cross (1981) argues that the drop-out rate from developmental programs might be reduced if the threat level for people with low self-confidence in their ability to learn were lowered through the combination of a supportive environment and sufficient time for adults to master the required competencies. Providing a supportive, safe environment for the learners, and allowing older students more time to learn, are basic adult learning principles.

Feng and Hian (1995) conducted research to determine whether ABE programs at community colleges in British Columbia actually incorporated the major principles of

adult learning into their learning activities. They found that “often a pedagogical approach was still prevalent. For example the lecture, direct instruction, was still the most favoured although other instructional strategies were employed” (p. 90). Likewise, Clague (1972) challenges educators to consider that “much of what is practiced in Canada today under the rubric of ABE is neither particularly basic nor particularly adult” (p. 23). Adult learning principles and practices should be utilized in all forms of instruction in developmental programs in order to effectively promote student success and to address the concerns about student retention.

Individualized Learning

Another concern of some adult educators is the use of individualized learning, instead of collaborative learning, in developmental programs. Bergin and Johnson (1995) express the concern that independent learning can isolate the learner and make it more difficult to develop social skills and form and maintain relationships:

Individualised learning can be isolating and does little to begin to address the communication and interpersonal skills we may have....Basic skills work becomes detached from context, becomes detached from the relationships and interactions that surround being able to live in society. (p. 235)

Quigley (1997) supports the positive outcomes of collaborative learning. He claims that “peers may be more important than teachers for at-risk learners with high field dependence, [and as such] small collaborative learning groups can be a successful approach for some learners” (p. 186).

However, individualized learning continues to be a strategy used in developmental programs in order to accommodate a broad range of student skill levels in one classroom with a limited number of instructors. Individualized learning is often used in conjunction with modules, or competency-based learning packages. Modularization of

programming can “provide a formal outline of the skills that...have to be demonstrated” (MacLeod, 1996, p. 206). MacLeod suggests that, when modules are used, the authority in the learning experience becomes “vested in the instrument of a module rather than in the expertise of the instructor” (p. 206). MacKeracher (1994) is also concerned that the use of separate learning modules in some ABE programs may isolate learners who would learn more effectively in small groups. She raises the concern that the use of separate learning modules can shift the focus of a program from “developing literacy skills to acquiring credits, from understanding ideas to remembering information” (p. 278). Learning styles and preferences vary with each learner, and can determine the success adult learners experience with individualized learning, as well as other ways of learning.

One of the subject areas taught in most developmental programs is mathematics. Individualized learning is often one of the methods used to allow the diverse group of students in developmental programs to acquire a variety of mathematical skills. Mathematics education for adults is a challenge for adult educators because of many adults’ previous negative school experiences with math, and because the learners’ may perceive a lack of relevance of much of the math curricula to their daily lives (Nesbit, 1995).

Math Instruction to Adult Learners in Developmental Programs

Although much of the literature on math instruction is specific to children, recent research on math education and adults does exist. Nesbit (1995) explored the teaching processes in math education in a range of community-college-based ABE-level courses. From his observations during the study, Nesbit noted that several themes emerged. One theme was that the teacher’s role in the classroom was that of decision-maker, while the

learners' roles were minimal and passive. Nesbit explains that "the overall goal for most teachers was to 'cover the assigned material' without losing too many students along the way" (p. 231). The pedagogical approach of learning a rule and applying it repeatedly was promoted in the classroom as the basic method of learning.

Nesbit (1995) observed that the teacher and the assigned textbooks were the authorities of mathematical knowledge in the classes, and that achievement was generally based on regular assessment tests, "with their form and content taken directly from the textbook. Teachers repeatedly stressed that such tests were essential preparation (either academically or vocationally) for the future, regardless of the specific goal of the students" (p. 232). Nesbit concluded from this study that "adult learners in mathematics classrooms are largely socialized into believing that their experiences, concerns and purposes are of little value" (p. 233).

Although Nesbit's (1995) study of math education in ABE programs paints a negative picture, other literature is more optimistic and indicates that facilitators of math education for adults are aware of some of the problems and are working to address these concerns. In 1995, the Adult Numeracy Practitioners Network (ANPN) was awarded a planning grant by the American National Institute for Literacy. The grant enabled ANPN to begin the work of developing adult numeracy standards for adult basic education as part of a system reform. The voices of 171 adult learners, as well as other stakeholders, were included in the study. About half of the learners were in GED classes, over a quarter were in ABE classes, and the remaining students were in other adult education programs such as English as a second language, workplace training, and developmental college courses. As a result of the ANPN study (see Curry, Schmitt, & Waldron, 1996), seven

themes emerged which serve as the foundation for new adult numeracy standards. Curry et al. report that “the participants called for a serious rethinking of the content and relevance of the adult basic education mathematics classes as they are currently taught” (p. 2).

Adult learners participating in the focus groups shared that one of the key reasons they were learning math was to help their children be successful in school. When the learners were asked what they needed to compete in today’s society in order to exercise the rights and responsibilities of citizenship, their answers fell into four general categories: access to information in order to orient themselves in the world; a voice for their ideas and opinions, and consideration of these ideas; the ability to solve problems and make decisions on their own; and the opportunity to continue learning in order to keep up with a rapidly changing world.

Although traditional approaches to math education for adults continue to be used in ABE and other developmental programs in community colleges, Nesbit (1998) suggests that a radical approach to math education could offer an alternative educational style that might improve the numeracy skills of adults. A radical approach toward math education would replace traditional practices “with specific curricula and methods to develop adults’ mathematical abilities as well as their capacities for critical awareness and action” (p. 186). Nesbit believes that radical educators could broaden the traditional approach to math education “by drawing upon the mathematical traditions present in different cultures and basing mathematical activities on adults’ day-to-day experiences of their social and physical environments” (p. 190). The radical approach to math education assumes the equal significance of what is learned and how it is learned, and includes both

collective and collaborative learning. The role of the radical educator is one of facilitator. The facilitator encourages and guides learners to “search for information to answer their own questions and to develop the skills of critical thinking and research” (p. 192).

The instruction of math to adults in developmental programs continues to be a challenge to adult educators involved in these programs. Further research and experimentation with methods of instruction and materials, and the recognition and acceptance of individual learning styles, may provide additional strategies for promoting student success in these programs.

Summary of the Literature

Adult educators hold a variety of opinions about whether self-direction is a personality trait or a teachable skill. Adult educators play an important role in the adult learning process. The role of the educator varies depending on the underlying philosophy of the program and the objectives of the learning experience. The attitude, skill level, and style of the teacher affect the adult learning process.

Adult educators at all levels are involved in the planning, delivery, and evaluation of programs for adult learners. Although there are many program planning models available, evaluation tends to be conducted at the end of the process, but it is often more effective if it is incorporated into the planning and program delivery on an ongoing basis. Evaluation can provide information needed for making decisions about the value of a program, or for making changes to improve a program. Depending upon the reason for the evaluation, a particular evaluation model may be chosen. Several evaluation models include the stakeholders of the evaluation in the evaluation process. Naturalistic, responsive, participatory, and utilization-focused evaluations are some examples of

stakeholder-based evaluation models. Utilization-focused evaluation focuses from the start to the finish of the evaluation process on how the evaluation results will be used.

Program planning and evaluation are frequently conducted at community colleges in Canada. Community colleges are institutions that provide a wide range of adult education programs to serve a heterogeneous student body. Community colleges usually include developmental programs such as ABE and academic upgrading among their diverse program offerings. Developmental programs provide basic skills, preparation for the labor market, and the opportunity for adult learners to meet the academic requirements needed for entrance to post-secondary programs. Student success and retention are concerns in developmental programs. The literature suggests using strategies that incorporate adult learning principles in order to encourage learner retention and success.

The literature on math instruction to adults in developmental programs suggests that the current system of teaching math to adults is often pedagogical and individualistic, rather than andragogical and collaborative. Practitioners who facilitate the instruction of math to adults in developmental programs are often challenged by the need to teach a set curriculum in a limited time period. A radical approach to math education is suggested as one way of making math more relevant to adults, while also improving the learners' critical thinking skills.

More research on mathematics education for adults is needed, as much of the literature focuses on math instruction to children. In the next chapter, I describe in detail the utilization-focused evaluation study of a modularized math program that I conducted at a community college in northern Alberta. My findings demonstrate areas of agreement

and disagreement with some of the current research on mathematics education for adults in ABE and other developmental programs.

CHAPTER 3

THE UTILIZATION-FOCUSED EVALUATION OF A MODULARIZED MATH PROGRAM

In this chapter I describe the utilization-focused evaluation that I planned, developed, and implemented with the collaboration of the math instructional group (MIG) of the upgrading department at the community college where I work. The chapter is divided into 3 major sections. In the first section I describe the steps I took to plan the evaluation process and to develop the instruments for the evaluation, using the assumptions of utilization-focused evaluation and adult learning principles to inform the planning and design. In the second section, I describe how I conducted the evaluation by gathering information from questionnaires, student focus groups, staff interviews, and statistical data. In the third section, I include a summary of the evaluation results, how these results were reported to the stakeholders, and the process of analyzing the evaluation results with the stakeholders. Finally, I summarize the resultant recommendations made by the math instructional group.

Planning the Evaluation

During this part of the study, I researched various evaluation models and studied the many steps involved in planning, designing, and implementing an evaluation. The planning of the evaluation study consisted of several stages, and took place over a 4-month period. The evaluation planning included the following: the preliminary planning

stage; three program planning meetings with the math instructional group (MIG); several informal meetings with the MIG in the math laboratory, commonly called the math lab; and the field test of the questionnaires and focus group questions.

Preliminary Planning

In preparation for the study, I read some of the literature on evaluation. The dismay of several authors (Guba & Lincoln, 1983; Herman, 1993; Knox, 1986) about the lack of use of the evaluation results made a strong impression on me, as my past experiences with program evaluation at the college had left me wondering why all the time and effort had been spent on the process. I was impressed by Johnston's (1992) view that evaluation should be tied into the planning and learning processes, and Chelimsky's (1997) assertion that evaluation is important in its own right because of the changes that occur when an evaluation is anticipated. Chelimsky also impressed me with her conclusion that evaluations tend to have three general purposes: accountability, development, and knowledge. This informed my decision that a developmental evaluation, which might help strengthen the math program, would be the kind of evaluation I wanted to undertake.

The idea of a developmental evaluation blended easily with Patton's (1997) ideas on formative evaluation as a way to improve and enhance programs at any time during the life of a program. As I read Patton's book on utilization-focused evaluation, the ideas of the utilization of the evaluation results, the inclusion of the stakeholders throughout the evaluation process, and the application of the evaluation information to program improvement helped to inform my decision to undertake a utilization-focused evaluation. Further reading of the literature on evaluation (Guba, 1978; Guba & Lincoln, 1983)

provided me with the idea of using more naturalistic, qualitative methods of data collection. In order to implement my study, I knew it was critical that the MIG members first agree to undertake an evaluation of the math program and, second, agree to a high level of involvement as stakeholders in the process.

Initially, I thought that the MIG members might help me in some minor way with the evaluation study. I was concerned that they would not have sufficient time available to them to work on an evaluation. In order to give the MIG members time to think about the idea of conducting an evaluation, I informally mentioned my study proposal to some of the group members shortly after I returned home from orientation. I was hopeful that, at the very least, a future meeting between myself and the MIG members would provide me with their areas of concern, sample discussion questions, and an indication of which members would be interested in being involved in an evaluation, and to what extent. At the beginning of the fall semester, the MIG, who were also the math laboratory staff, consisted of the following seven individuals: five instructors, two instructional assistants, and one individual who worked in both capacities. Some individuals held full-time positions, whereas others worked part-time. I hoped that all of these individuals would be able to attend at least the initial planning meeting.

Eventually, the first planning meeting with the MIG was arranged with the help of the coordinator of the math lab. Prior to meeting with the MIG, I distributed a memo to the group members explaining what I needed from them. I also gave each member a summary of evaluation guidelines and checklists (Grotelueschen et al., 1974), and a summary of the steps involved in the evaluation process (Caffarella, 1994). This information was intended to give the group members some background information on

what an evaluation might involve, and thereby facilitate the discussion at the first planning meeting.

At this time, there were several questions I hoped to address by conducting an evaluation: How could we better address student needs? Should students be aware of the philosophies of their instructors, and why they do what they do? Would students feel better if they understood their own learning styles? Would it help students if they understood why a modularized system was used in the math laboratory, instead of a more traditional form of instruction? I was anxious to talk to the members of the MIG and find out if they shared similar questions or concerns.

The First Planning Meeting

The first planning meeting was held on October 6, 1999. In addition to the materials I had distributed earlier, I gave each of the MIG members two new handouts: a list of sample questions which might be asked of students in order to better understand their learning styles (Grow, 1991; Guglielmino & Guglielmino, 1982), and a chart summarizing different kinds of collaborative evaluations and the amount of stakeholder involvement expected for each kind of evaluation (Cousins & Whitmore, 1998). The materials I provided facilitated discussion about the reasons for an evaluation, the extent of involvement of the MIG members in an evaluation, student learning styles, and the kinds of information that could be useful to the group. After considerable informal discussion, the members of the group unanimously agreed that they wanted to be involved throughout the entire evaluation process. By the end of the meeting, the group decided that their involvement would include determining the wording of questions to be asked of the students and of themselves, analyzing and interpreting the collected

information and data, and deciding if and how the data might influence future program design and delivery. My role would be that of facilitator of the evaluation process. I would gather information from the MIG members and students, and share that information with the group. I would also be a tool for drafting questions, conducting the group discussions and individual interviews with the math lab staff, and requesting and presenting the data from the college registrar's office to the MIG members.

Once the group decided on their level of involvement throughout the evaluation process, I focused the meeting on a discussion of what kinds of information would be useful to them. Because the discussions tended to wander, focusing on the use of the results helped to direct the decision-making for the remainder of the first planning meeting and at future meetings. As the facilitator of the planning meetings, I kept asking the group members questions such as: How will this information be used? What do you want to know more about? What information is useful to you if you are going to use the information to improve service to students or to improve student success rates?

By answering these questions, the group eliminated some of their initial suggestions and concerns and decided that, although all the information sources they had discussed might be interesting to pursue, the resulting data would not necessarily provide them with information they could use to improve the math program. After considerable discussion, the group decided that the most useful information to them included the following: how students preferred to learn, what students did or did not like about the method of delivery and materials used in the modularized math courses, what students would suggest for course improvement, whether students understood what instructors expected of them in the courses, and what strategies were used by the students who were

successful in the courses. The MIG also thought it would be useful to look at statistical data provided by the college registrar's office for the four previous academic years and to compare the success rates of students in each course by semester and by grade level. These came to be the four central questions explored in the evaluation.

The group members also decided on several points about collecting data from the students: student input could best be obtained from the upgrading students by talking to the students in an informal setting; the lunch break was the best time to talk to students so that they did not miss their other scheduled classes; an informal setting might allow the students to feel safe and comfortable; I should introduce myself to the students as a fellow student working on a research study, rather than as an instructor. The MIG hoped that the students would be encouraged to respond openly and honestly if they viewed me as a fellow student and if the data gathering process was confidential. Consequently, the MIG elected not to be directly involved in gathering data from the students, and they would not have access to individual student responses.

Two discussion groups, one composed of new students and the other of continuing students, were agreed upon as the way to gather information from the students. Each group would consist of a maximum of 15 students in order to facilitate discussion and accommodate room size. Questionnaires were not considered as a means of gathering data until later in the planning stage.

The group agreed that individual interviews of the math lab staff would be conducted in order to gather background information and staff perceptions about the math program. The interviews were intended to provide the following information: MIG members' perceptions of what worked well in the math lab and what could be improved,

background information on the history of the math program, and examples of students for whom the program did or did not work well.

At the conclusion of the first planning meeting, I had collected an extensive list of questions and topics that could provide the MIG members with useful information. I agreed to review the suggestions for questions for the individual staff interviews and the student focus group discussions, revise and construct new questions, and present a draft of the questions to the MIG prior to the next planning meeting. The group members were responsible for reading over the questions I drafted, and coming to the next meeting prepared to suggest changes or approve the drafted questions.

As I constructed the questions to ask the student groups, I concluded that there were too many questions for students to answer during a one-hour group discussion. I also decided that some of the questions called for a personal response from the students rather than group discussion. Consequently, I began drafting a questionnaire so that students could give quick, written responses to many of the questions, leaving those questions more conducive to group discussion as a separate list. As I proceeded, I found that the questions for continuing students needed to be worded differently than the questions for new students. As a result, I drafted two questionnaires—one for the new students, and one for the continuing students. I also composed a set of interview questions for the staff. I distributed all the drafts to the group members about 10 days prior to the next planning meeting.

The Second Planning Meeting

The second planning meeting with the MIG was held on November 3, 1999. Discussion about the number of students to be involved in the evaluation resulted in the

decision to conduct two focus groups of continuing students, rather than one, so that information could be gathered from a larger sample of students who had completed a modularized math course. The two continuing student focus groups were to be divided by grade level as much as possible, thereby facilitating discussion about courses that were more similar in content and reading level. The MIG members confirmed that one focus group of new students should be a sufficient sample, as only a small number of new students had registered to begin a math course in January 2000.

After I explained to the group my rationale for creating the questionnaires, the MIG members discussed the drafts I had distributed earlier. They agreed to the use of questionnaires to collect personal information from the students. They also decided that each student participating in the focus groups should complete a questionnaire prior to the group discussions. The remainder of the second planning meeting focused on finalizing the questions for the questionnaires, focus group discussions, and staff interviews. At the end of the meeting, the MIG members expressed genuine interest and enthusiasm about the evaluation, and they were eager to see the students' responses to the questions.

After the meeting concluded, I revised the questionnaires, incorporating the suggestions of the group into the revisions. Final approval of the questionnaires by the MIG, and a field test of the questionnaires and discussion questions with a few students, were still required before the questions could be used to gather information for the evaluation.

The Third Planning Meeting

The third planning meeting was held November 24, 1999. After a few minor changes were made to the questionnaires, the group approved them for use in the study. Tentative dates were set for the January focus groups. The final dates would be established later, depending upon the availability of a room suitable for group discussion, and upon the availability of students willing and able to participate in the evaluation during the 11:30-1:00 lunch hour. The MIG decided that each participating student should be asked to sign a release form which described the study and which acknowledged that the names of the students providing information would remain confidential. The coordinator of the MIG agreed to recruit students for the focus groups, as well as to arrange for a few students to meet with me in early December to field test the questionnaires and discussion questions.

The November 24, 1999 meeting was the last formal planning meeting held with the MIG during the planning phase of the study. Because of time constraints, several informal meetings were held in the math lab over the next couple of weeks in order to finalize arrangements for the field test and the student focus groups.

Field-Testing the Questions

On December 2, 1999, I met with a few students at the college to field test the questions for the questionnaires and the focus group discussions. The field test served several purposes: it determined whether the questions were clear and easy for students to understand; it tested whether the responses to the questions provided the kinds of information the group wanted to collect; and it gave me an idea of how much time to allot at the start of each focus group for the completion of the questionnaires.

The field-test group consisted of three academic upgrading students who had already completed courses in the math lab. Two of the students were male, and one was female. They were all between 30 and 40 years of age. Two of these students began taking math courses at the college in September 1999, whereas the third student had been taking math courses since the fall of 1998.

The students completed the questionnaire in less than five minutes. I then discussed each of the questions on the questionnaire and on the list of discussion questions with them. I asked the students what they understood each question to mean, and whether they could suggest how to make each question easier for other students to understand. The students told me how they interpreted each question and offered their suggestions for improvement. Several times during the field test I found it necessary to refocus the discussion on the purpose of our session. The students wanted to share their thoughts on the math program and to discuss how they preferred to learn, rather than comment on the wording of the questions.

The field test provided some useful suggestions for changes to the questionnaires; the students uncovered problems with the questions that the staff and I had not anticipated. For example, the students found they could not answer yes or no to some of the questions. Instead, they wanted to be able to indicate that a statement was true only some of the time, and they wanted to have the opportunity to explain their answer. Consequently, I changed the questionnaires to incorporate the students' suggestions. Once I completed the revisions to the questionnaires, I took them to the math lab staff for their approval. The revised questionnaire used to gather information from the continuing student groups is located in Appendix A. As the new student questionnaire was a shorter

version of this questionnaire, it is not included in the appendices. The set of discussion questions for the continuing student groups is located in Appendix B, and the set of discussion questions for the new students is located in Appendix C.

Conducting the Evaluation

Several methods of data collection were used to gather information about the modularized math program. In this section, I first discuss the process of interviewing the instructors and assistants in the math laboratory, and I summarize the results of the interviews. Second, I describe the three focus groups I conducted in January 2000 and the new student follow-up group I conducted in March 2000, and I offer my observations and reflections on the focus group process. Third, I describe the process of summarizing and analyzing the statistical information that was provided by the registrar's office. Fourth, I discuss writing the evaluation report, and I provide a summary of the evaluation results. Finally, I discuss analyzing the results and making the resultant recommendations collaboratively with the math instructional group.

The Instructor and Instructional Assistant Interviews

I conducted individual interviews with each of the 7 MIG members in order to acquire sufficient background information to establish a context for the rest of the evaluation report. All interviews but one were held over a period of 4 days; the last interview was conducted about a month later when the instructor had time available. During the interviews, I asked the MIG members for their perceptions of the math program, their suggestions for program improvement, and their stories about students who had either done well, or who had experienced difficulty, completing a modularized

math course. The questions used for the math laboratory staff interviews are located in Appendix D.

Some staff members initially seemed nervous about being interviewed, even though the group had previously approved the questions. Other staff members wrote out their answers or made notes to ensure they covered the points they wanted included in the report. Each interview took about an hour to complete. The staff members with the least amount of experience had the shortest responses. Those with the most years of experience offered extensive comments and narratives about how the math program had evolved and how the math modules had developed and improved over the years.

Several common themes emerged in response to the questions. The staff painted a picture of the characteristics of the students most likely to succeed in modularized math courses—for example, conscientious, hard working, self-directed, organized, goal-oriented, asks many questions, and regularly attends class. The staff also painted a picture of the characteristics of the students most likely to have difficulty completing modularized math courses—for example, shy, non-assertive, poor reader, poor class attendee, demonstrates few study skills, lacks a specific career goal, wants to be taught, and doesn't want to do the work in the modules. The staff members expressed disappointment that all students were not successful and that attrition rates were higher than they would like to see; the staff perceived themselves as student-oriented and caring; they also were unsure what they could do to motivate students to complete their work on time.

The First Focus Group—New Students

Each of the three focus groups was conducted in the same format, and in the same meeting room which held a large, circular table. Prior to the group sessions, I wrote the questions for each of the discussion groups on separate sheets of flip chart paper, coded the sheets by group number, and hung them on a flip chart stand located at one side of the room. I grouped the questions into three main topic areas: student learning preferences, the modularized math courses and the operation of the math laboratory, and the content of the modules.

About 15 minutes before each group convened, I laid out consent forms, questionnaires, and pens at each seat around the table. This facilitated the process of explaining the forms to the students, and allowed late arrivals to join the session and catch up on their own with a minimal amount of disruption to the discussion. Fortunately, the majority of students arrived early to all of the sessions.

I held the focus group of new students on Thursday, January 20, 2000. Students in this group had just begun a math course at the college on January 3, 2000. Although 14 students had agreed to participate in the new student group, only nine students showed up for the scheduled session. Six female students and three male students participated in the group. Three of the nine students were working on math at the ABE level, three students were taking a grade 10 equivalency course, one student was taking a grade 11 equivalency course, and two students were taking a grade 12 general equivalency course.

Although the first student group was small, the students seemed pleased to participate in the evaluation. They completed the release forms and questionnaires in about 5 minutes. Once the introductions and paperwork were completed, I led the

students through the series of discussion questions (see Appendix C). The members of the new student group allowed each individual to speak one at a time, allowing me to easily record their comments on the flip chart sheets. I asked the students in the group to verify that the comments I recorded under each question were complete and correct before I proceeded to the next question.

I was disappointed with the small size of the group because I planned to reconvene the new student group for a follow-up session 2 months later. However, despite the small size of the group, I still planned to meet with them again for several reasons: to determine the number of new student participants who were still in the math program, to determine why the remaining students had been successful up to that date, and to find out whether the remaining students' perceptions about the courses had changed at all since the January focus group session.

Shortly after I met with the first student group, I tabulated the results of the questionnaires by hand. I used an additional copy of the questionnaire to collate the results, summarizing the information from the completed questionnaires onto one form. I collated the responses to the group discussion questions in the same way, listing the student comments under the appropriate questions. I decided to use the same process to compile the results for the remaining student groups.

The Second Focus Group—Continuing Student Group 1

I held the second focus group on Friday, January 21, 2000. The group was composed of 9 female and 6 male students, all of whom had successfully completed at least one math course in the fall semester. Seven of the students were in grade 12 college

preparation math, 7 of the students were in grade 11 equivalency math, and 1 student was in the grade 12 general equivalency math course.

The students completed the necessary paperwork in less than 5 minutes and then responded to the set of discussion questions (see Appendix B) for approximately one hour. The group was comfortable talking and offering responses although at times one member of the group tended to dominate the conversation. Unlike the first group, I had to remind this group several times to allow one person to finish their comments before the next person spoke.

Although the questions had been field tested prior to their use, all of the questions did not work particularly well with this group of continuing students. Several of the questions seemed repetitious or had subtle differences in meaning that were difficult for the students to interpret. Nevertheless, this group articulated their answers very well. I wondered, however, whether the strong voices of several of the students in the group intimidated some of the quieter students.

The Third Focus Group—Continuing Student Group 2

I held the third focus group on Wednesday, January 26, 2000. The group was composed of 5 male students and 6 female students. Four of the students were taking courses at the pre-high school level, and 7 students were taking grade 10 equivalency math. This group was a fun-loving and light-hearted group, and the students seemed very relaxed throughout the session.

Similar to the other groups, the students completed the paperwork in about 5 minutes, and the discussion questions in just over an hour. Despite the initial energy of

the group, the students seemed exhausted after 50 minutes, and I found it difficult to keep the group focused on responding to the last few questions.

The New Student Follow-Up Group

I held the follow-up session with the new student group on March 23, 2000, approximately 2 months after the initial group discussion, and 3 weeks before the end of the winter semester. The group consisted of 4 women and 2 men. One male who had missed the first group session joined the follow-up session. Unfortunately, one of the participants from the earlier group had withdrawn from the college, one student did not show up for the session, and two other students had not been notified about the session until that morning, and consequently were unable to attend.

Although no questionnaire had initially been planned for this follow-up group, I decided it would be more expedient to use a questionnaire to gather some of the information. I could then limit the number of discussion questions and shorten the information-gathering process. However, as it turned out, the students in this small group were very comfortable talking, and the four discussion questions, plus some additional feedback about the evaluation process, took over an hour.

My Observations and Reflections on the Focus Group Process

The majority of students who participated in the evaluation seemed to enjoy the group discussions and were pleased to have their opinions considered and recorded. A few students completed the release forms and questionnaires, but did not actively participate in the group discussions. I was unable to determine if they were uncomfortable talking in front of a group, did not have the self-confidence to voice opinions different from the more assertive students, or whether they were surprised that a

group discussion was part of the evaluation. One student told me she had no idea that she was expected to talk in a group. She thought that the only reason she had come to the meeting room was to complete a questionnaire. Apparently, there was some miscommunication between at least one of the instructors and one of the students. A few students in each of the groups did not get involved in the discussion because they arrived late to the sessions. Because I had earlier laid out the consent forms and questionnaires at each seat around the table, they completed the forms while the rest of the group was talking.

Initially, the math instructors identified those math students who were available to attend a group session over the lunch hour without missing other classes. The students who participated in the groups were volunteers from this list of available students. Because the students were not chosen randomly, but were selected primarily by a schedule that allowed their participation, the results of the evaluation may not be as accurate as if the participants had been randomly selected. However, finding another mutually agreed upon time to schedule student groups and encourage participation posed an even bigger problem.

Encouraging students to participate in the evaluation was not an easy task. Although the initial plans were to have 15 students participate in each group, only the last group of continuing students had all the students show up for the group session. The new student group was missing 5 students, and the first group of continuing students had 4 missing students. Some students viewed participation in the evaluation as extra work for them. Other students preferred to use any spare time they had during the day, including their lunchtime, to work on homework. The students who participated in the evaluation

showed that they were involved with the math program, and that they cared enough about the program to be participants. Thus, I am concerned whether or not the opinions of those students who do not like to learn on their own, and who do not like the modularized system, are adequately represented in the gathered student information.

The Statistics From the College Registrar's Office

Because the MIG wanted some of their questions and assumptions about the completion and success rates of the math courses examined, I requested statistical information about the modularized math courses from the registrar's office. The statistics covered the four academic years from 1995 to 1999, and provided considerable information about each course offered in the math laboratory. The statistical information included the following information for each course: the distribution of grades, the total number of registrations, the number of withdrawals, the number of students auditing the course, the number of students receiving a grade of absent-fail, and the number of students debarred from examinations.

With some assistance from two other instructors, I set up the statistical information in an EXCEL format and generated the percentage of students completing each course. The percentages made understanding the data and comparing course and semester success rates much easier. I gave the newly formatted statistical information to all the MIG members about 10 days before a group update meeting on February 2, 2000. At the meeting, the members of the group requested that I summarize the statistical information further for them. They would later analyze the results and decide what impact, if any, the results would have on future programming. The summarized

information is presented in the section of this chapter entitled "Summary of Evaluation Results."

Summarizing, Analyzing, and Recording the Evaluation Results

In this phase of the evaluation, I wrote a preliminary evaluation report for the math instructional group. The purpose of the report was twofold: to set a context for the report by documenting the history and background of the math laboratory and the perceptions the MIG members held about the modularized math program; and to compile qualitative and quantitative data gathered from and about students, compare the data with the MIG perceptions, and use the data as a basis for recommendations for program changes.

In this section, I first describe how I summarized the results of the student questionnaires, staff interviews, and statistical information into an evaluation report for the math instructional group. Second, I provide a summary of the results of the evaluation, including the students' suggestions for changes to the math program. In the third section, I describe the process of analyzing the evaluation results with the stakeholders and making the resultant recommendations.

Writing the Evaluation Report

In preparing the evaluation report, I found organizing the material from several different sources, and in several different formats, a challenge. Because the interviews with the members of the MIG and the answers to the group discussion questions were in narrative form, the data did not lend themselves to easy tabulation. After each student discussion group, I tabulated the questionnaire responses from each group on a blank questionnaire. In order to organize the student comments, I listed them in random order

under the corresponding question number. I included these summaries as a major portion of the evaluation report. When I was compiling the student information, I realized that if the continuing students had identified the courses they were taking, I would have had an easier time identifying which modules the students wanted changed. However, at the time when the questionnaires were designed, the course numbers were not identified as essential information.

After information was collected and compiled from the first three student groups, I noticed similarities in the responses to many of the discussion questions. Most of the responses could be grouped under three main headings: people, the modularized system, and the physical location and setting of the math laboratory. Consequently, I experimented with putting the answers from each student group into chart form, listing each response beside one of the three headings under the appropriate column heading that indicated student satisfaction or a desire for change. Finally, I combined the three student response charts into one chart that summarized the results of all the student groups.

Once I completed the chart summarizing the student results, I decided to try summarizing the results of the MIG interviews in a similar fashion. Initially, I listed the responses to each question under each of the original interview questions, and noted whether a majority of the staff members, or only one or two members, gave similar responses. When I reviewed the responses, I noticed a number of areas where the majority of staff agreed on their answers. There were also some areas where only one or two staff members expressed a particular opinion. When I completed a summary chart of MIG responses, I indicated only those responses made by the majority of the group.

Finally, I compared the responses of the students with those of the MIG staff in one chart (see Table 1, p. 75).

The final copy of the preliminary evaluation report that I prepared for the consideration of the math instructional group consisted of the following sections: the background and history of the math laboratory, the staff interview results, a summary of questionnaire responses for each of the student focus groups, a summary of answers to the discussion questions asked of each of the student focus groups, a summary of all the student information, a summary of student strategies for success, an analysis of the 1995-1999 statistical data, and appendices of all data collection instruments.

Summary of Evaluation Results

The first section of the questionnaires (see Appendix A, p. 114) asked for responses from the students about how well they liked to read, and how they preferred to learn. The responses from the 3 groups varied considerably, with the higher level students in the continuing student groups preferring to read more than the students in ABE courses. The new student group was a mix of students taking courses ranging from the ABE level to a grade 12-equivalency level. Fifty-six percent of this group of students responded that they read occasionally, 33 % responded that they liked to read, and 11% responded that they did not like to read. The new student group did not clearly express a favorite way of learning. Instead, reading, listening, and a combination of learning strategies, including watching and doing, received the same number of responses.

In the second focus group, composed primarily of grade 11 and 12 high school equivalency level students, 67% responded that they liked to read, 27% responded that they read occasionally, and 6% responded that they did not like to read. Although this

group had the highest percentage of readers, 40% of the students indicated that they preferred to learn by doing, 27% by watching, 20% by a combination of methods, including listening, taking, and taking notes, 13% by reading, and 6% by thinking about something for a while.

The third focus group, composed of continuing students taking grade 9 and grade 10 equivalency math courses, indicated that 46% of the group loved to read, whereas 28% hated to read but read some. One student did not respond to the question. Similar to the second group, 64% of this group responded that they preferred to learn by doing, whereas the responses to each of the following learning strategies were tied at 9% each: reading, watching, listening, and thinking about something for a while.

The majority of students who participated in the focus groups indicated satisfaction with the modularized system, with 81% of the continuing students and 66% of the new student follow-up group responding that they enjoyed learning math by using self-instructional modules. The majority of the participating students also indicated that they liked to work on their own. Whereas 89% of the new students indicated that they liked to work on their own, 67% of the first group of continuing students, and 100% of the second group of continuing students, responded this way. An additional 20% of the first group of continuing students responded that they sometimes liked to work on their own.

During the focus group discussions, continuing students indicated that they found the flexibility of the modularized system provided them with the opportunity to set their own pace and decide on test dates, using the course outlines as guidelines. As adult students, they believed that the flexibility in the program allowed them to work around

other demands on their time. Students liked the one-on-one assistance provided in the math laboratory, and, generally, they enjoyed the opportunity to read, ask questions, and practice relevant skills on their own. When the students were asked if they were able to learn primarily from reading the instructions and examples, completing the practice exercises, and correcting their own work, students responded as follows: 67% of the new student group responded yes, whereas 33% of this group indicated they could learn this way most of the time; 47% of the second group responded yes, whereas 47% responded they could learn this way most of the time and 6% responded no; 9 % of the third group responded yes, whereas 82% indicated that they could learn this way most of the time and 9% responded no.

The students regarded the people working in the math lab as one of the most positive aspects of the modularized math program. Students viewed the staff as caring and approachable individuals. All of the new students responded that they were comfortable asking the instructors and assistants for help, whereas approximately 91% of the continuing students responded that they were comfortable asking for help and 9 % responded that they were comfortable only at certain times.

Generally, the continuing students were satisfied with the help they had received in the math lab. Seventy-four percent of the continuing students responded that staffing in the math lab is okay, but sometimes you have to wait a few minutes for help. The other 26% of continuing students responded that there was always help available when they needed it. In contrast, 50% of the new student follow-up group responded that there was always help available when they needed it, and 33% responded that staffing was okay, but that they sometimes had to wait a few minutes for help. Although no one responded

that there was not enough staff and that they always had to wait too long for help, students in the second focus group commented that there were times when they wanted more help, and less time waiting for assistance. They recognized that more money would be required in order to change this situation, and they expressed the concern that additional funding for more help in the math lab might result in higher tuition costs.

During the group discussions with the continuing students, they indicated that they wanted the modules to be as clear and concise as possible. They noted that the clearer the modules were, the easier and more quickly they could learn on their own. When asked if the current modules were easy to follow, 43% of the continuing students responded yes, and 57% indicated that they were sometimes easy to follow. Similarly, 56% of the new student group responded yes, and 44% responded that they were sometimes easy to follow.

The student groups viewed the laboratory setting as a satisfactory or ideal setting for the modularized math program. Students found that the opportunity to drop into the lab for extra help when they had spare time was a real benefit to their learning. Over 85% of the continuing students responded that they regularly spent extra time in the math lab. During the follow-up session with the new students, 83% indicated that they had also regularly spent extra time in the math lab. Student comments indicated that many liked to work quietly on their own in the study carrels located around the far wall of the room. Students also liked being able to enter and exit the lab as they wished.

Although students did not indicate that the noise level in the math lab was an issue for them, some students commented that occasionally they would like to ask other students for help, or offer help to them. However, they had been asked not to talk because

of the noise level in the room. Students also expressed the desire to discuss some of the more difficult topics with their instructor and with other students from time to time. They suggested that short lectures and discussions could take place to introduce topics, review topics or modules, and prepare for the midterm and final exams.

Overall, students who participated in the evaluation affirmed that the modularized math program serves the majority of students well and is a system that successful students find particularly well-suited to them as adult learners. Students clearly expressed that regular attendance, a positive attitude about math, self-discipline, self-motivation, time-management skills, and personal responsibility are qualities that adult students should possess if they are to be successful at college, and in a modularized math course. They questioned why some students bother to come to college at all if they are not planning to attend regularly and have no academic goals. However, students also cautioned that it is easy for undisciplined students to get behind in the modularized math program because of the many hours of individualized study expected of them to complete each course. They suggested that instructors follow each student's progress very closely in order to identify students who are falling behind and to encourage them to stay in class and complete their courses.

When the responses from the students and the MIG staff were compared, a number of similarities were apparent. The results are summarized in Table 1, located on the following page.

Table 1
Staff and Student Areas of Satisfaction and Areas Where Change is Desired

	Satisfaction	Desire for Change
People	1. The staff are caring, approachable, and student-centered.	1. More staff would be appreciated in the busier classes.
Modularized system	1. The system is flexible, and allows adults to set their own pace, plan their testing schedule, and accommodate other adult obligations. 2. <i>The procedures developed to operate the modularized system and complete the administrative tasks are very well organized.</i> 3. <i>The modules have shown much improvement over the years.</i> 4. <i>Strategic timetabling of similar classes and a more even distribution of students over the course of the day improve the system.</i>	1. Students would prefer all modules to be written clearly, concisely, with all steps included in examples, but with no extraneous information. 2. <i>More time is needed for the ongoing revisions and development of modules.</i> 3. It is easy for undisciplined students to get behind. 4. Steps could be taken to identify/help students who do not learn well on their own, are poor readers, have learning disabilities, or are shy or non-assertive.
Location/ Physical	1. The lab is easily accessible to students and provides a positive atmosphere for learning. 2. <i>The current lab setting allows support staff to be deployed more equally.</i>	1. <i>The noise level in such a large, round classroom is often a concern.</i> 2. <i>Two smaller classrooms, located close together, would be preferred.</i> 3. <i>Study carrels provide a quiet place for students to work but do not allow easy approach or access to students and tend to isolate them from the staff.</i>

- **Bold print** on the chart indicates that both staff and students share this perception.
- **Regular print** on the chart indicates the perceptions of the participating students.
- **Italicized print** on the chart indicates the perceptions of the math lab staff.

The final section of the evaluation report was a summary of the statistical information and answers to the questions and assumptions the group had previously decided they wanted addressed. Individual data for the 4-year period did not show that students in the higher levels of math courses are more likely to complete a course than those students taking lower level courses. In fact, the percentage of completion at the lower course levels was sometimes higher than the percentage of completion of students taking higher level courses. The percentage of completion for most courses varied from semester to semester and from year to year. No course level emerged as the one that divided courses with consistently low success rates from those with consistently high success rates. However, when I calculated the average percentage of success for each course over the 4-year period and ranked the results from highest to lowest, I determined that the average percentage of completion for all courses was 66%. The grade 6 ABE math course, and the grade 10 business math course, fell significantly below this average for the 4-year period.

There was a significant difference between the completion rates and success rates of students in the fall and winter semester courses. Students in the fall courses consistently completed courses with a higher success rate than did the students registered in winter semester courses. The lowest average fall success rate for a course was 65% for the 4-year period, whereas the lowest average winter success rate for a course was 43%. Spring session success rates were consistently good, and in 3 of the 4 academic years, the spring session success rate was higher than the fall semester success rate.

Analyzing the Evaluation Results and Making Recommendations

The meeting with the MIG to discuss the results of the evaluation and to make recommendations about how the results would be used was held on April 26, 2000. The group members made the following recommendations:

1. Two kinds of early intervention will be implemented in the fall. First, approximately 4 days after the start of the semester, the instructors will meet with their classes as a group and will discuss further the following topics: how the modularized system works, student learning styles and preferences, study groups, and strategies for success suggested by successful students. This discussion will be in addition to the orientation discussion that is held on the first day of classes.
2. The second intervention will take place 2 or 3 weeks after the start of each semester, when each student will be asked to complete a short questionnaire about their progress in the course to date. They will also be asked to let their instructors know if they are having difficulty and need additional help, and what kinds of help they prefer.
3. A mentor program will be implemented for students who begin a course in the winter semester. New students will be assigned a peer who has previously been successful in the course.
4. A short questionnaire requesting student comments about the modules will be handed out to the students when they receive the review sheets for the midterm and final exams.
5. Longer questionnaires, similar to the ones used in this study, will be administered to all students biannually. The questionnaires will be administered near the end of the academic year.

6. Instructors who have groups of students expressing an interest in occasional group work or review sessions will make every attempt to arrange sessions for their students, provided that space can be booked and that the group is large enough to justify leaving the math lab.

7. The MIG members will explore the possibilities of remodeling or renovations so that permanent space can be found for testing students and for small group work.

8. Other student suggestions will continue to be considered and experimented with throughout the coming academic year. These suggestions include reducing the impact the final exam has on the final grade, allowing more time to complete midterm examinations, and including more questions on the midterm examinations so that the questions are not as heavily weighted as they currently are.

In addition to making the above recommendations, the MIG members discussed and corrected some of the information in the preliminary evaluation report. The final report will be shared with all members of the upgrading department, as well as with the members of the college community who have an interest in the results of the evaluation and the type of evaluation used in this study.

Further discussion of the consistency of the study with an adult education focus, the usefulness and outcomes of the utilization-focused evaluation, the improvement of my practice, and my conclusions and recommendations to adult educators as a result of this study are included in the next chapter.

CHAPTER 4

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was the development and implementation of a utilization-focused evaluation of a modularized math program offered by a developmental program in a community college. In the first section of this chapter, I discuss the consistency of the evaluation process with ideas expressed in the literature. In the second section, I examine the usefulness of utilization-focused evaluation within the college system, including the outcomes of the utilization-focused evaluation and the improvement of my practice as an adult educator. In the third section, I offer conclusions about the study. Finally, I offer recommendations to adult educators about the implementation of utilization-focused evaluations.

Consistency of the Evaluation Process With an Adult Education Focus

In this section, I describe how adult learning principles and literature influenced my study. First, I discuss the planning of the utilization -focused evaluation, including using a naturalistic approach, involving stakeholders, and designing and testing the questions. Second, I summarize the influence and relevance of adult learning principles and literature on conducting the evaluation, including collecting the data, writing the evaluation report, and making the resultant recommendations.

Planning the Evaluation

In the early phase of planning the evaluation, I read a variety of the literature on the topics of adult learning, program planning, and evaluation. I was unsure which

program planning and evaluation models were most suitable for the study. My past experience at the college with evaluation had left me believing that evaluation was not particularly useful, and was most often imposed on individuals or a college department by administration or by contractual requirements. In my experience, this imposition resulted in an inordinate amount of work in a short period of time and negligible use of the results of the evaluation. Somehow, I wanted to ensure that the results of the evaluation study I conducted would be put to use.

Initial planning. In the initial planning stage of the study, I used Vella's (1994) seven steps of planning to aid me in writing the study proposal and to outline what needed to be done and by whom. Vella's seven steps of planning are posed as the questions who, why, when, where, what for, what, and how. Because these questions were simple and straightforward, I also used some of them when working with the math instructional group to design the questionnaires. Additionally, I applied several of Vella's principles of effective adult learning to the study. One of Vella's principles for effective adult learning that I applied was the use of teamwork and small groups, both for the planning and decision-making of the evaluation itself, and for gathering information from the students. The use of small groups and teamwork allowed all the major interests to be represented and encouraged dialogue among the MIG staff, among the students, and between the students and staff. The adult learning principle of using teamwork and working with small groups worked for the planning and implementation of the evaluation, much as the principle works for other learning situations.

I also used Caffarella's (1994) 12-step process for planning a program evaluation as one of the guides for the first planning meeting. I found her detailed approach useful,

and it ensured that no details were overlooked during the planning phase. Caffarella summarizes her 12-step plan for a systematic program evaluation in chart form, and asks evaluators to complete the chart, listing the details pertinent to each of the 12 steps for the evaluation they are planning. This structured approach ensured that some of the details not fully addressed in my initial study proposal that used Vella's (1994) seven-step plan were addressed in detail. The details addressed more completely by Caffarella's plan included the exact purpose of the evaluation, how the results would be used, what would be judged, how the questions would be formulated, and exactly how and when the evaluation data would be collected.

I also used the guidebook written by Grotelueschen et al. (1974) to help the MIG members make decisions about the evaluation at the first planning meeting. I found that the checklists included in the guidebook were especially helpful for leading the group through the meeting and making some of the initial planning decisions. As a group, we reviewed the sections on the reasons to evaluate, who the evaluation was for, what questions should be addressed, what resources were available, what data should be collected, and how the data should be gathered. I found, as Grotelueschen et al. had, that the guidebook recognizes the "complexity in adult basic education, honors differing viewpoints, and allows different conclusions to be drawn" (p. 1).

As the planning for the evaluation progressed, some of the answers to the initial planning questions changed. In fact, plans and decisions often changed from one meeting to the next. This finding is similar to Boyle's (1981) observation that the components of evaluation models are not a logical sequence of steps, but rather a "complex of interacting elements" (p. 46). According to Boyle, when new elements are introduced,

changes and adaptations must be made to the original plans. Likewise, Patton (1997) states that the flow of the utilization-focused evaluation process is not linear. Rather, in utilization-focused evaluation, a good deal of flexibility and creativity are required to evaluate each situation and complete the appropriate steps for each evaluation.

Throughout the planning process, I adapted my role as evaluator. Some of the roles I assumed during the planning phase were facilitator, writer, negotiator, and data-gatherer. Although the MIG members wanted to make most of the major decisions about the evaluation, they also wanted me to be a tool for their use. This meant that I would do the majority of the time-consuming work generated by the evaluation process. Patton (1997) similarly recognizes that “in utilization-focused evaluation, the evaluator is always a negotiator—negotiating with primary intended users what other roles he or she will play” (p. 12).

For many years, I had listened to comments about the math program from both staff and students. In the planning stages of the study, I decided that I wanted to obtain more formal results through a formal evaluation process. I agreed with Knowles (1980) that informal evaluation occurs continuously, but “does not serve the same purpose as periodic, systematically planned evaluation” (p. 203). Likewise, the MIG received feedback informally throughout the academic year, and sometimes met to discuss the feedback. However, decisions often had to be made on assumptions and on a few isolated comments or concerns. This experience lends credibility to Knox’s (1986) belief that the evaluation process should be formalized in order to use a “process that communicates findings in ways that encourage people associated with the program to use those findings for decisions on program planning, improvement, and justification” (p. 165).

A naturalistic approach. I found Guba's (1978) model for using naturalistic inquiry interesting, but too complex, to follow for the purposes of this study. However, I wanted to incorporate some aspects of naturalistic investigation into the study, if possible. Guba describes the naturalistic inquirer as a phenomenologist, or one who is "concerned with describing and understanding social phenomena" (p. 12). I wanted to describe how the math program started, how it evolved, and how it currently was operating. I thought that I could immerse myself into the investigation, as Guba recommends, "with as open a mind as possible, and permit...impressions to emerge" (p. 13). However, I found this difficult for me to do because of my previous experience with, and perceptions about, the math program. I could not eliminate the concerns that students had expressed about being taught versus learning on their own. I also could not eliminate my assumption that the results of the evaluation would demonstrate that many students were not happy with the math program as it existed, and that they wanted major changes made to the program.

Because naturalistic inquiry lends itself to "description and understanding" (p. 13), I included a section in the preliminary evaluation report describing the environment in which the math laboratory operates. I also included a summary of the staff interviews and the diverse perceptions of the math lab staff about the modularized math program. Similarly, Guba suggests that "much of the reality with which the naturalistic inquirer must deal exists only in the minds of individual people and depends heavily on their separate perceptions" (p. 15). I discovered that whereas most of the instructors held similar perceptions, others held perceptions about the operation of the math program and the math laboratory that were neither good nor bad, but very different from the majority of the group. I also found that using both narrative and empirical data,

and some naturalistic methods, provided considerable variety as well as balance in the kinds of information included in the evaluation report. Chelimsky (1997) similarly advocates that evaluators should be more open minded and “use quantitative as well as qualitative methods” (p. 25) as well as other methods of evaluation.

Involving stakeholders. One of the purposes of my study was to involve the major stakeholders of the evaluation as collaborators. Initially, I was unsure how to encourage the involvement of the MIG members. I decided to begin by introducing them to a chart that described different types of collaborative evaluations (see Cousins and Whitmore, 1998). The chart explained the roles and levels of involvement stakeholders might assume in the different evaluation models. I also emphasized to the MIG that the information I gathered during the evaluation could be useful to them for the development and improvement of the modularized math program.

Patton’s (1997) model of utilization-focused evaluation was helpful in this regard. This model was the simplest one to use because of its flexibility and adaptability, as well as its focus on how the results would be used throughout each step of the evaluation process. Because utilization-focused evaluation can include any kind of evaluative purpose, data, design, or focus, it was the perfect model to adapt to the evaluation of the modularized math program. Patton’s model was also ideal because utilization-focused evaluation “is a process for making decisions about these issues in collaboration with an identified group of primary users focusing on their intended uses of the evaluation” (p. 22). I found that focusing on the use of the results with the major stakeholders of the evaluation provided me with a strong sense of direction and the feeling that the evaluation process was a constructive one. Once the evaluation focused on gathering

information useful to the group for program improvement, the group members could see the relevance of the evaluation and they were anxious to see the results.

Because I did not want an evaluation to be threatening to the group, I emphasized that the evaluation would be a formative one—one that focused on “ways of improving and enhancing” (Knox, 1986, p. 180) the program. I tried to emphasize, like Patton (1997), that a formative evaluation could “provide feedback for fine-tuning a well-established program” (p. 69). Since the modularized math program was established over 20 years ago, focusing on gathering information to fine-tune the program appealed to the MIG, the major stakeholders of the evaluation results.

Designing the questions for the student focus groups. The instructors I worked with on the MIG team held various opinions about what kinds of information should be gathered from the students. They also possessed a diversity of knowledge and experience working with students with different learning styles and preferences. Therefore, before formulating questions with the MIG, I shared some of the literature describing the characteristics of adult learners and different learning styles with them. The group then engaged in a lively discussion about learning styles. The discussion on student learning styles lead into a debate about how students viewed individualized learning and the use of modules to learn math. The MIG decided that the students should be asked questions regarding their perceptions of learning by reading the modules and completing practice exercises on their own. I anticipated that information gathered about students’ perspectives on individualized learning might indicate that they thought, similar to Bergin and Johnson (1995), that “basic skill work [was] detached from context ...[and] from the relationships and interactions that surround being able to live in society” (p. 235).

MacKeracher (1996) also expressed similar concerns about individualized learning that I thought needed to be addressed in the questions.

While deciding on the kinds of questions to ask the students, the MIG also debated whether or not it was their responsibility to help students get ready for a modularized system if the students did not have the skills they needed to succeed when they started a course. One instructional assistant commented that, "We always make the assumption that they [the students] are ready to learn using modules." The group was aware that, in reality, some students do not have good study skills and are unprepared for the amount of individual study involved. Not all members of the MIG believed that it was their responsibility to teach the students the study skills they were expected to have when they started a course. However, some members of the group believed, like MacKeracher (1996), that "facilitators can assist adult learners to learn how to learn by helping them become aware of their own learning styles and how to develop the skills of the styles they tend to avoid" (p. 205). Therefore, in addition to the questions about individualized learning, the group also decided to gather information from the students in the modularized math program about how they thought they learned best.

In addition to raising group awareness about learning styles, I also wanted data that would address student motivation and self-direction as contributors to student success in the math courses. I was anxious to learn whether the responses to these questions would confirm Wlodkowski's (1999) assumptions that the reasons why a student attends a program, the opportunity to experience choice and decision-making about their learning, and the experience of success in their learning activities are all motivators for student learning and strong indications of student success. Consequently,

some of the questions I asked the students on the questionnaires and in the focus groups included the strategies they used to be successful and how they motivated themselves to work through a course.

Patton's (1997) ideas also influenced how I designed the questions for data gathering. Patton suggests including questions about the program's strengths and weaknesses, the staff and participant perceptions of the program and the program's culture and climate, the extent that the participants are progressing toward the desired outcomes, the types of participants who are making good progress and the types who are not doing well, and the new ideas that are emerging that might be tried out and tested (p. 68). I found these suggestions practical and useful, and I incorporated them into the construction of the questions for the questionnaires, discussion groups, and interviews.

The field test of the questions provided me with useful information for planning the focus group sessions and for modifying the questions prior to using them for data collection. The students identified problems with some of the wording and with the choices of answers for some of the questions. This finding was in agreement with Gosling's (1995) suggestion that a test on a small group "will expose any problems (for example in the wording or translation of questions...or in the length of the questionnaire) which should be addressed before starting to collect data" (p. 173).

Conducting the Evaluation

One of the major purposes of the study was to collect information about the modularized math program that would be useful to the MIG members, who were the primary intended users of the evaluation results. I used a variety of data collection methods for the study, including questionnaires, focus groups, interviews, and statistical

information. The literature also suggests incorporating several methods of data gathering into an evaluation. For example, Gosling (1995) suggests using several kinds of data collection because “using different techniques gives greater depth to the information collected” (p. 146).

Collecting data. The student focus groups were one way for me to collect data while practicing adult education principles such as safety and dialogue with the students. The open discussions allowed students to express their opinions, suggest improvements, and be involved in the decision-making about their math program. Likewise, Knowles (1980), MacKeracher (1996), and Vella (1994) agree that it is important that adult learners be involved in dialogue and decision-making about their program of learning.

During the discussion groups, students recommended early identification of those students who were not comfortable learning independently by working their way through self-instructional modules. The students noted that independent learning is not for everyone, and that students can easily get behind in a program that is primarily individualized study. This is in agreement with Wlodkowski’s (1999) view that not all learners respond well to a self-directed learning environment. In order to identify some of the at-risk students, the focus groups suggested that a short questionnaire be given to each student to complete about 2 weeks after each semester begins. The questionnaires would give students who were experiencing difficulties the opportunity to ask for help with their learning. Likewise, Quigley (1992, 1997), Bergin and Johnson (1995), and Waite (1972) suggest that the initial placement and the first few weeks of a course are critical to the success of adult learners in ABE and upgrading programs.

Although the MIG had previously agreed upon the staff interview questions, not all staff members had the same comfort level while being interviewed. I found conducting the staff interviews more rigorous than facilitating the student discussion groups. Not only did the staff have different interpretations of the questions, but several staff members also took the opportunity to talk about personal concerns. Because I knew each of the staff members personally, I had to struggle to maintain neutrality, while recognizing the validity of the perceptions of all MIG members. This is consistent with Patton's (1997) observation that "qualitative data collection...poses different validity challenges. In qualitative methods, validity hinges to a greater extent on the skill, competence, and rigor of the researcher" (p. 252).

Writing the evaluation report. Both qualitative and quantitative data provided background information for the evaluation report and offered a variety of information to be included in the report and to be considered before recommendations were made. However, I found consolidating the mix of information for presentation to the math instructional group challenging because, as a group, we had not taken the time during the planning phase to decide exactly how the data should be presented. Because the group did not have the time to spend organizing the data once it was collected, the MIG members allowed me to decide how to organize and present the information to them. As a novice to the reporting of evaluation results, I had a difficult time deciding what form of reporting would provide the clearest information. My experience supported Caffarella's (1994) warning that "when different kinds of data and multiple data sources are used, a failure to outline the data analysis procedures clearly beforehand can be especially problematic" (p. 138). Rather than summarize the student comments for the preliminary

report, I chose to list all comments to display their diversity. This was in agreement with Gosling's (1995) suggestion of showing "the range of different opinions and why they are held, rather than present a broad agreement which may be superficial"(p. 59).

However, when the MIG later requested summaries of all data in the evaluation report, I included both a range of opinions and summary charts.

In contrast to some of the concerns expressed in the literature about individualized instruction, students in the second focus group commented that learning through the modularized system helped them learn the material more thoroughly, because they had to spend time on their own thinking about and learning the concepts. The students thought that by the time they learned a concept, they would not easily forget it. These comments disagreed with Nesbit's (1995) findings that "at the very least, learning math is portrayed as the acceptance of, and obedience to, the authority of others, rather than as a process of discovery, awakening, or understanding" (p. 233).

Also in contrast to Nesbit's (1995) study, where the learners' roles were minimal and passive, students in the modularized math program knew they were expected to assume a major role in their learning and that they needed to be both self-motivated and self-directed in order to succeed. Whereas Nesbit (1995) found that "within the classroom, the teacher's role was paramount" (p. 231), student responses in my study indicated that the math lab staff were student-centered and encouraging of student self-responsibility and decision-making about their learning. The staff were also recognized by students as being a positive element of the course. Additionally, several students in the second focus group commented that the staff went over and above what was expected of them. Also, because the system is modularized, the math lab staff often encouraged

students who worked hard but could not proceed through the course in one semester to take the course over two semesters. This practice concurs with MacKeracher's (1996) findings that adults do not learn well under time constraints and that they learn best when they set their own pace for learning. An additional indication of the student-centeredness of the staff became apparent during the staff interviews, when the majority of staff expressed the desire to find new ways to help students succeed, and when all staff members expressed frustration that it was difficult to motivate some students to complete a course.

Despite differences between the results of my study and Nesbit's (1995) study, there were also areas of agreement. For example, I found that most students accepted the instructions in the modules and the staff explanations and one-on-one instruction as the way to learn math. This was in agreement with Nesbit's findings that "the teacher and the textbooks adopted the role of supreme authorities of mathematical knowledge" (p. 232).

Although the students were accepting of the modularized system, they still strongly criticized specific sections of certain modules. They also requested very clear step-by-step instructions, and they suggested that any superfluous topics or instructions be eliminated from the modules. Some students in the focus groups also shared that there were times when they would like to learn by listening to what other students had to say. These students wanted group work or peer tutoring, in addition to the modules, to help them learn. This supports Nesbit's view that "interactions in mathematics classrooms must be viewed not only in educational and pedagogical terms, but also as social experiences" (p. 232).

Making Recommendations

After the MIG members discussed the evaluation data, they decided as a group on the recommendations they wanted included in the evaluation report. This is consistent with Patton's (1997) suggestion that "the kinds of recommendations, if any, to be included in a report are a matter of negotiation" (pp. 324-325). The recommendations made by the MIG were a result of analyzing the information gathered, making judgements about that information, and focusing on changes that the MIG could make to facilitate student learning. Gosling (1995) similarly notes that "as a result of collecting and analysing information in assessment, monitoring, review, and evaluation, it should be possible to draw conclusions which can be acted upon....Recommendations are based on the conclusions" (p. 59).

The MIG concluded from the data that the early days and weeks of a course were the critical times to identify students who were experiencing difficulty. Consequently, they recommended two early interventions to address the concerns about identifying and providing follow-up to at-risk students. Their recommendations are consistent with the findings of Quigley (1992, 1997) and Waite (1972) about the importance of making students feel comfortable in the first few weeks of a program in order to improve retention.

Both the MIG members' responses and the students' responses identified the students with poor study skills as the students most at risk in the courses. The students who participated in the evaluation expressed little sympathy to the needs of the students who attended class sporadically, produced little work, and appeared to lack personal

motivation and goals. In contrast to the student view, the MIG members wanted to try out some new strategies that might help these floundering students adjust to a modularized system. Consequently, they recommended early interventions as a way to identify some of these at-risk students, encourage dialogue between the students and their instructors, and teach and reinforce study skills such as organization, time management, and how to get help from peers and instructors. Although other strategies of providing student support were discussed, the strategies relied on changes in other areas of the department or the college. The MIG's decision to exclude recommendations that were not within their control was consistent with Patton's (1997) recommendation that the evaluator or primary intended users making recommendations should ensure that any recommended actions be within the control of the intended users.

The MIG also recommended the use of short questionnaires administered prior to the midterm and final examinations to gather information from the students about the modules. Although the data gathered from the longer questionnaires were useful, the MIG members thought that shorter questionnaires on specific topics could provide more immediate and frequent feedback from the students. Similarly, Caffarella (1994) suggests that recommendations about the format and questions used on a data-gathering instrument may also be made by the stakeholding group.

The MIG's recommendation to explore the possibility of renovations in order to create space for small group work was the only recommendation that required monetary resources and would need to be approved as a capital expense in the college budget. Likewise, Caffarella (1994) suggests that when recommendations are made, the resources required to address those recommendations should also be considered. Despite the costs

involved, the MIG decided that the group members could still research the possibilities for additional space and request any required funding at the next opportunity.

Usefulness of Utilization-Focused Evaluation

In this section, I first discuss the outcomes of the utilization-focused evaluation study I conducted, including what I learned about evaluation, the positive experiences for the adult educators involved in the evaluation. changes to the modularized math program, and student learning experiences. Second, I discuss the improvement of my practice as a result of conducting this evaluation study, including the use of adult learning principles and what I have learned about student needs, learning styles, and the college system.

Outcomes of the Utilization-Focused Evaluation

This evaluation study resulted in a number of positive outcomes. First, the basic premises and stages of utilization-focused evaluation (Patton, 1997) guided me, as a novice evaluator, through the evaluation process and also provided me with the skills I needed to lead the MIG members through the process. During the evaluation, I reacted to what the intended users had to say and responded to how their ideas changed as the evaluation planning progressed. I adapted the evaluation process and the evaluation questions in light of changing conditions or requirements of the MIG. This was consistent with Patton's (1997) premise that evaluators must be active-reactive-adaptive during an evaluation, interested in the challenges of each setting, and responsive to the needs of the intended users. I found that Patton's assumptions and premises encouraged me in my role of evaluator and reassured me that the evaluation was proceeding as it should, despite changing circumstances and plans.

As a result of using the utilization-focused evaluation model in this study, the evaluation that evolved was designed for stakeholder usefulness, program improvement, and to meet the requirements and circumstances of a department at a community college. Consequently, data were collected from several different sources, and at times and in places that suited the different groups who were providing information. The utilization-focused evaluation model allowed the evaluation design and process to be tailored to the specific needs of the groups involved in the evaluation. For example, student focus groups were arranged according to the lunch hour schedule and room availability in order to gather student data. The planning sessions and interviews with the MIG were arranged around the other responsibilities and commitments of the group members.

Utilization-focused evaluation proved to be a useful tool in the college setting, where politics, funding, and the needs of a diverse student body can make the role of adult educator extremely challenging. Being involved in the evaluation of a program and courses was a positive experience for the adult educators involved because they received information that they could put to use almost immediately; as Patton (1997) states, “Dedicated program staff don’t want to waste their time doing things that don’t work” (p. 366). For example, during the staff interviews, several members expressed a concern that they were unsure that the 5% bonus, currently being given to students who write the midterm and final exams on time or early, was motivating the students to stay on schedule. However, because all the student groups commented that the bonus was a motivator for them, the MIG instructors were convinced that the bonus should remain in place for the coming year.

The evaluation process itself provided the opportunity for dialogue among the staff members and students, as well as the opportunity for staff and students to express concerns and offer suggestions about the modularized math program. As a result of being a part of an evaluation and a process of learning more about different evaluations, the group members are committed to make use of the results. As well, they are aware of some of the opportunities for learning and improvement that an evaluation may offer them. This outcome is consistent with Johnston's (1992) view that the participants in an evaluation learn a great deal from the evaluation process itself.

The evaluation reawakened and educated the staff to some of the possibilities available to them to help students succeed. For example, during a planning meeting, one MIG member commented that we (the MIG staff) assume that students have the skills and readiness to meet the expectations of them in the math courses. A discussion followed about whether or not all students actually do have the skills to start and complete the courses and questions about student learning preferences were included on the questionnaires. As a result of the gathered information, the MIG members considered ways to help ease the students into a program of individualized study. The questions about student learning preferences provided useful information about how the students preferred to learn. Similarly, Wlodkowski (1999) suggests that instructors "may want to use diagnostic or formative evaluation procedures to better understand their [learners'] capabilities and experiences" (p. 39). Now that the MIG members have more information about the students' desire to learn by talking to other students, the MIG members will make every attempt to conduct small group review sessions. These review sessions will provide students with opportunities for social interaction, discussion, and a peer support

system. This supports Wlodkowski's belief that formative evaluations can provide the information instructors need to "create instructional procedures for better adult motivation and learning" (p. 39).

The evaluation of the modularized math program served as an opportunity to remind the MIG staff of their role in the program in general and in the individual courses in particular. In addition to increasing staff awareness of learner needs, the utilization-focused evaluation affirmed that the MIG staff were doing a good job and that their efforts were appreciated by the students, two factors that may make staff feel more fulfilled in their jobs. The MIG members' positive responses to the comments about their job performance confirmed Wlodkowski's (1999) philosophy that effective instructors need the same conditions for work and learning, as their adult students need for optimal learning to occur:

To experience our jobs as intrinsically satisfying, we need to feel respected where we work, to believe what we do is relevant, and to have a sense that we can effectively accomplish the challenges we value. If these conditions are met, we live a professional life in which we breathe the air of vital meaning. (p. 335)

Likewise, the utilization-focused evaluation in the study provided the staff with a feeling of competence and accomplishment. For example, in response to the students' comments that the MIG members were very approachable and one of the most positive aspects of the modularized math program, one MIG member commented, "It's nice to know we're doing something right."

As a result of being included as stakeholders in the evaluation, students became part of the decision-making about the math program. The evaluation provided the opportunity for students to view their suggestions for course and module improvement as valued contributions to the evaluation and to program planning. Although many of the

students who participated in the study had definite career goals and excellent study strategies, all the participating students had the opportunity to reflect on how they learned and on what other strategies might also facilitate their learning. Through their comments, the students were able to send a strong message to the MIG members that they wanted the freedom to set their own test dates and to work on their own as much as possible. Likewise, Briton et al. (1992) agree that “adults who are actively involved in the identification of their needs, in the design of their learning, and in the implementation of their own learning plans are more motivated to succeed” (p. 35).

The utilization-focused evaluation also provided some unexpected learning opportunities for the students. For example, during the focus group discussions, the participating students learned about other students’ learning preferences, some of the advantages and disadvantages of classroom instruction versus individualized instruction, and what strategies other students used to succeed in the courses. This unplanned learning was consistent with Vella’s (1994) assumption that “the learning is in the doing and deciding” (p. 14).

In addition to the benefits the students received from participating in the evaluation, the planning stage of the evaluation process resulted in a change to the physical arrangement of the math lab. After the MIG discussion about student learning preferences, several of the MIG members decided that the arrangement of computer desks might make it uncomfortable for some students to work privately on computers in the math lab. Consequently, the MIG members rearranged the computer desks to provide more privacy for the students. This change in the math lab, occurring before the evaluation was conducted, is consistent with Chelimsky’s (1997) belief that the

evaluation process is important in its own right even if the findings are not used, because “things change anyway because an evaluation is anticipated” (p. 16).

Another unexpected positive outcome of the evaluation came about as a result of the favorable comments made by the students during the evaluation. The student comments and questionnaire responses substantiated a request by the math instructional group for additional funds for the development and improvement of the modules used in the math program. Many of the modules are now being revised or completely rewritten to make them easier for students to understand.

Because regular evaluation of classes had previously not been part of the history of the college upgrading department, the evaluation study provided the opportunity for me to introduce formative, utilization-focused evaluation to a group of department members, in what I endeavored to make as non-threatening a situation as possible. I am hopeful that as a result of the study, formative evaluations of other department courses will now be more common in the future.

Although the evaluation did not produce negative outcomes, there were limitations and ambiguities regarding what could be learned through the evaluation process. First, the focus groups were limited to students who were available to participate during the lunch hour. They were also limited to those students who had either successfully completed a math course in the fall semester or who were just beginning a math course for the first time in the winter semester. This process of selecting students for the focus groups eliminated students who had been in the program in the fall semester, but who had not returned to take a course in the winter semester. The process also eliminated students who had classes scheduled during the 11:00 to 1:00 time slot

available for group discussions. Thus, I am still unsure whether the opinions of the students who do not like to learn math on their own, as well as the opinions of those who left the program without completing a math course, have been adequately represented. The MIG members are aware of the ongoing need to identify this group of students and to gather information from them. The MIG members also continue to view the success and retention of students in the modularized math program as important issues that need to be addressed each semester. However, there are many and varied reasons why students withdraw from the college or leave courses before completing them, and these reasons are not necessarily revealed to the staff.

Overall, the utilization-focused evaluation of the modularized math program resulted in a number of positive outcomes and was a positive experience for the individuals who participated in the evaluation. The results of the study also contributed to the improvement of the instruction to, and the materials used by, the ABE and academic upgrading students at the college.

Improvement of My Practice

My understanding of the learning needs and learning styles of the students in the modularized math program and my understanding of evaluation in the college system have improved significantly as a result of conducting this study. In addition to using Vella's (1994) seven steps of planning during the initial planning stage of the evaluation, the study also provided me with the opportunity to incorporate several of Vella's 12 principles of adult learning into the planning, design, and implementation of the study. As I used several of the principles, I observed, as Vella did, "how deeply intertwined they are" (p. 17).

The use of adult learning principles. I incorporated several adult learning principles into my study, including immediacy, safety, developing relationships, and the use of teamwork and small groups. The principle of immediacy tied in well with utilization-focused evaluation, the relevance of the information sought, and the immediate use of that information. Before I could get approval from the math instructional group to be part of the evaluation, the group members needed to see that the information gathered for the evaluation would be immediately useful to them and would be used to benefit the students. Working with the math instructional group was similar to working with any group of adult learners, who, according to Vella (1994), “need to see the immediate usefulness of new learning: the skills, knowledge, or attitudes they are working to acquire” (p. 16).

As I conducted the study, I found that the adult learning principles of safety, the development of relationships, and the use of teams and small groups were very intertwined. Because of the political environment at the college, the safety and trust of the group I planned to work with had to be established prior to working collaboratively with them. Throughout the evaluation, I had to respect the sensitivity of the individuals in the math instructional group because of their personal investment in the modularized math program. Students also had to feel safe before they would participate in the evaluation, especially as part of a discussion group. In order to ensure safety for the group members, I held the student focus groups in a small meeting room with a round table, and I held the planning meetings with the math instructional group in comfortable surroundings outside the college.

I had to develop a relationship with the students to ensure that they felt respected and valued as contributors to the study. Without first establishing a relationship with the students, I could have had difficulty facilitating the sessions, and student responses might not have been as open and honest as they were. After each of the group discussions concluded, some students were comfortable enough to stay behind and talk to me as I cleaned up the room. They shared some of their more personal feelings, and told me about friends who were too shy to ask for help. Additionally, they expressed an interest in seeing the results of the evaluation. They were safe and comfortable in the environment created for the group discussions. This is consistent with Vella's (1994) explanation that safety "means that the design of learning tasks, the atmosphere in the room, and the very design of small groups and materials convey to the adult learners that this experience will work for them" (p. 6).

The adult learning principles of teamwork and the use of small groups, both for the planning of the evaluation and the gathering of student information, were also essential to the success of the study. Most students enjoyed the opportunity to participate in the evaluation and work as part of a small group. Because some of the students thought working in groups helped them to learn, students in the first and second focus groups suggested that small groups could be used for module or course reviews. Vella (1994) similarly notes that "the assurance of safety and shared responsibility available in teams has always proved welcome, no matter what the cultural setting" (p. 19). The use of small groups and teamwork was one of the most important adult learning principles I incorporated into planning the evaluation and gathering the information. I wanted the

study to be relevant and useful, and involving the key stakeholders in small group discussions and decision-making ensured that this happened.

Finally, the evaluation also gave me the opportunity to practice designing and testing questionnaires, summarizing and recording evaluation results, and sharing the results with the stakeholders. As a result of my experiences completing this study, I changed my opinion about the usefulness of evaluation and the importance of ongoing dialogue between the staff and the students. Likewise, Guba and Lincoln (1983) believe that investigators themselves are changed through interacting with the subjects of an investigation.

Understanding student needs and learning styles. The information gathered from the student groups heightened my awareness of the diverse needs of the many students who take modularized math courses. The students who participated in the evaluation suggested that questionnaires be administered at the start of each semester in order to address the needs of the students who were experiencing difficulty with individualized learning. They also suggested that the staff attempt to meet the needs of these students in a way that supplements the individualized learning of the modularized system and offers additional support to the students who need it. As a result of these suggestions, student progress will be closely followed and students will be given the opportunity to meet privately with their instructors to discuss their learning needs and finds ways to accommodate these needs whenever possible.

The results of the evaluation made me aware that some of the more negative comments heard informally in the classroom, although an important indicator of individual perceptions, may not be representative of the opinions of the majority of the

student group. Assuming that the students responded to the evaluation questions honestly and had not given responses they thought I wanted to hear, the evaluation results strongly indicated satisfaction with the modularized math program. For example, questionnaire responses indicated that only 6 % of the continuing students in the second group did not enjoy learning via the modularized system. All the rest of the students in the three student groups responded that they enjoyed learning via the modularized system most or all of the time.

It was affirming to learn that a majority of the participating students found that the modularized system worked well for them as adults, and that they enjoyed the flexibility the modularized system offered them. Prior to the evaluation, I thought that stricter guidelines for test dates should be enforced. After reviewing the student responses, I now think the guidelines should remain flexible.

I also learned from the comments made by students in the first and second focus groups that often students do not understand why they have to learn some of the concepts in the courses and they do not know when these concepts will be used. Similarly, Nesbit (1995) found that some students find math difficult because they do not find it relevant to their everyday lives. However, the majority of participating students who had long-range goals requiring considerable mathematical skills were more concerned about the clarity of instructions in the modules and the opportunity for group reviews than they were about relevance. The goal-oriented students accepted the need to attain specific math levels in order to reach their academic goals, and they were willing to learn whatever concepts were necessary for them to receive credit at the required math levels.

Understanding the college system. Completing a utilization-focused evaluation study at a community college taught me that an evaluator must recognize that each evaluation situation is different. The evaluation must be planned and designed to meet the needs of the stakeholders, but it must also fit into the system in which the program being evaluated operates. In this case, the evaluation had to fit into the community college system. The college and the upgrading department of the college both had unique cultures and histories that I had to respect and accommodate.

I also learned how difficult it is to be totally objective as an internal evaluator when you are familiar with the people and the history of the program you are evaluating. Although I tried to distance myself from the group and conduct myself as an external evaluator, I was much more aware of the feelings of the individual group members, the dynamics of the group, and the culture of the department than I would have been as an external evaluator. This awareness was not necessarily a negative factor, as knowing the group members as individuals helped me to better understand the kinds of information they wanted and why they wanted it. However, because I did know the group members personally, I had to deliberate how to best present some of the MIG interview results to the group without causing conflicts or offending anyone. The statistical data and the student comments were much easier to present to the MIG because they were not as personal. Similarly, Patton (1997) notes:

The advantage of qualitative portrayals of holistic settings and impacts is that attention can be given to nuance, setting, interdependencies, complexities, idiosyncrasies, and context. In combination [with quantitative portrayals], the two approaches can be powerful and comprehensive; they can also be contradictory and divisive. (p. 286)

Finally, I learned that the term evaluation holds different connotations for the various individuals working at a college, and that an evaluator must be sensitive to the perceptions and feelings of these individuals if the evaluation is going to proceed smoothly. Once the evaluation focused on finding ways to improve the program and to improve student success, the evaluation process became less personal and less threatening to the math lab staff. Being involved in the evaluation process provided the staff with the opportunity to expand their perceptions of the program and to view the math program from the perspective of an evaluator. This is similar to Patton's (1997) conclusion that viewing the world as an evaluator may have a more significant impact on the participants in an evaluation than the evaluation results. The evaluation process was a learning experience for all of us who participated in the study. Optimistically, the positive effects of that experience will be felt in the math laboratory for many years to come.

Conclusions

In this section, I provide a summary and conclusions about the utilization-focused evaluation study of a modularized math program. The purpose of the study was twofold: a) to obtain information which would determine if the math program for ABE and academic upgrading students, which utilizes self-instructional modules, was meeting the needs of the students; and b) to examine the process of planning, developing, and implementing a utilization-focused evaluation at a community college. In addition to the main purposes of the study, I also wanted to learn more about the needs of the students who take the math courses, and I wanted to incorporate adult education principles into my practice.

During the development of the study, I made four assumptions: the MIG members want to do the best job they can to help students succeed; the MIG members want to receive information about the courses they teach, provided that the information is useful to them and may help them make course improvements; the MIG members would want some level of involvement in the design and implementation of an evaluation of the modularized math courses; and the students would be able to provide useful information about their learning preferences, their likes and dislikes, and how the math courses could be improved. Each of these assumptions was confirmed by my study. The first three assumptions were confirmed during the planning stage of the evaluation. The fourth assumption was confirmed by the student information collected during the evaluation process.

The planning, design, and implementation of the evaluation was done using the assumptions of utilization-focused evaluation, a form of evaluation in which the focus is on the use of the results throughout the entire evaluation process. The evaluation was a formative one, and the results were used for program improvement.

The math instructional group (MIG), which was composed of five instructors and two instructional assistants, were the primary users of the evaluation results. As the primary stakeholders, they worked collaboratively with me to make decisions about what information would be useful to them, the kinds of questions to be asked, the design of the questions, the composition of the student focus groups, the analysis and summary of the data, and the resultant recommendations.

Students were also included as stakeholders in the study. Thirty-five students, divided into three student focus groups, participated in the evaluation. One group was

composed of new students, who also participated in a follow-up session at the end of the semester. The remaining two groups were composed of continuing students who had successfully completed at least one modularized math course in the preceding semester. All participating students completed questionnaires prior to the start of the group discussions.

The focus on the use of the evaluation results facilitated the planning meetings and the other stages of the evaluation. The evaluation elicited students' perceptions about the modularized math program, the materials used in the courses, the instructional staff, and the math laboratory setting. The students viewed the MIG staff and the math laboratory as two positive aspects of the modularized math program. Students indicated that they enjoyed using the modules to learn math because the flexibility of the modularized system enabled them to work on their own and meet their adult responsibilities. Some students requested additional time for discussions or short lectures to introduce or to review some of the more difficult topics. The continuing students shared strategies for succeeding in the modularized math courses, including regular attendance, having a positive attitude about math, making a commitment to the course, being disciplined, managing time wisely, studying with other students, staying on schedule, and asking the staff a lot of questions.

The interviews with the MIG provided a history of how the math lab had evolved over the years, as well as staff perceptions about how well the modularized system was presently working. All math laboratory staff viewed themselves as student-centered, and they could identify the characteristics of the students who were likely to be successful in the courses, as well as those who were likely to be at risk in the courses. They expressed

their frustration that not all students complete a course, and they indicated that they wanted to do whatever they could to improve student success.

The statistical information indicated that the success rate of students enrolled in the winter semester courses was consistently lower than that of students enrolled in fall and spring semester courses. The average completion rate of all the modularized math courses over a 4-year period was 66%, and some courses fell consistently below this rate. Now that the courses with the lowest success rates have been identified, students in those courses and students who enter the math program in the winter semester will be viewed as high-risk students and will be monitored more closely.

When the staff analyzed the data and made recommendations, the early identification of students experiencing difficulty working with the modularized system was viewed as a priority. Two new interventions will be used in the math laboratory in the first 3 weeks of classes to identify the students experiencing difficulty and to seek ways to help them adjust to individualized instruction and the modularized system.

The modularized math program in this study is satisfactorily meeting the needs of the majority of the students who take ABE and upgrading courses at the community college. The MIG members are now aware that the success rate of students in the courses may be improved by early intervention, the introduction of more social interaction through small group work, and the ongoing consideration and implementation of other student suggestions. The study indicates that there are a number of benefits of modularized instruction versus classroom instruction, and that this type of instruction can be used successfully for the mathematics education of students in ABE and academic upgrading programs.

Recommendations for Adult Educators

Based on the outcome of this study on the utilization-focused evaluation of an ABE/academic upgrading modularized math program at a community college, I offer five recommendations for other adult educators.

1. I recommend that utilization-focused evaluations be used whenever possible for the evaluation of ongoing, well-established programs at community colleges. The ongoing involvement in the design and implementation of the evaluation process provides staff with an opportunity for learning and professional development. A utilization-focused evaluation, for the development or improvement of a program, will produce more positive outcomes than will an evaluation that is imposed on a group with no clear indication of how the results will be used.

2. I recommend that formative evaluations involve the key stakeholders from the start to the finish of the evaluation process so that the results are useful and the stakeholders have a vested interest in putting the results to use. Additionally, regular formative evaluations, focusing on the use of the evaluation results, can ensure that a program or course stays up-to-date, and can provide information to justify funding needs.

3. If formal evaluations cannot be conducted periodically, then brief, formative evaluations should be conducted regularly. Gathering student perceptions on a regular basis can provide feedback and ideas for the staff to reflect on, and can facilitate program planning. Formal evaluations may require more time and resources than a community college has available.

4. I recommend including the views of as many students as possible. Although even a small sample provides useful information, surveying all students in a program or course provides the most valid results and the clearest picture of student opinions, concerns, and needs.

5. I recommend that time be spent during the planning stage of the evaluation to narrow the scope of information sought by the primary users. Narrowing the scope, and reducing the number of questions asked of the students, would allow more time for in-depth exploration of the major issues and for the identification of solutions for those issues.

In the future, I plan to use what I have learned from this study in my practice as an adult educator, and to benefit my students, my department, and the college. I hope to continue to improve my evaluation skills and help the upgrading department implement regular formative, utilization-focused evaluations of department courses. I also plan to continue to investigate the learning preferences and learning styles of my students and will experiment with new strategies that may improve student success in a modularized program of mathematics education.

References

Alexander, A. A. (1997). The Antigonish movement: Moses Coady and adult education today. Toronto: Thompson Educational Publishers.

Bergin, S., & Johnson, A. (1995). Learning difficulties and the power of labelling: Shifting definitions and practice in adult basic education. Adults Learning, 6(8), 234-238.

Boyle, P. G. (1981). Planning programs for adults. New York: McGraw-Hill.

Briton, D. (1996) The modern practice of adult education: A postmodern critique. Albany: State University of New York Press.

Briton, D., Collet, D., Cooney, D., Deane, A., & Scott, S. (1992). Emancipation through the acquisition of basic skills: A curriculum-planning process for marginalized adults. In M. Taylor & R. Bedard (Eds.), Proceedings of the 11th Annual Conference of the Canadian Association for the Study of Adult Education (pp. 32-37). Saskatoon: University of Saskatchewan.

Caffarella, R. S. (1994). Planning programs for adults. San Francisco: Jossey-Bass.

Chelimsky, E. (1997). The coming transformations in evaluation. In E. Chelimsky, & W. R. Shadish (Eds.), Evaluation for the 21st century: A handbook (pp. 1-26). Thousand Oaks, CA: Sage.

Chovanec, D. M. (1998). Self-directed learning: Highlighting the contradictions. In S. M. Scott, B. Spencer, & A. M. Thomas (Eds.). Learning for life: Canadian readings in adult education (pp. 300-312). Toronto: Thompson Educational Publishers.

Clague, M. (1972). ABE in Canada: Are the poor included? In W. M. Brooke (Ed.), Adult basic education: A resource book of readings (pp. 23-47). Toronto: New Press.

Cousins, J. B., & Whitmore, E. (1998). Framing participatory evaluation. In E. Whitmore (Ed.), Understanding and practicing participatory evaluation (pp. 5-23). New Directions for Evaluation, no. 80. San Francisco: Jossey-Bass.

Cross, K. P. (1981). Adults as learners: Increasing participation and facilitating learning. San Francisco: Jossey-Bass.

Curry, D., Schmitt, M. J., & Waldron, S. (1996). A framework for adult numeracy standards: The mathematical skills and abilities adults need to be equipped for the future. Retrieved from the World Wide Web on November 15, 1999: <http://www.std.com/anpan/frame1.html>

Dennison, J. (1986). Values in the Canadian community college: Conflict and compromise. In J. Dennison (Ed.), Challenge and opportunity: Canada's community colleges at the crossroads (pp. 167-183). Vancouver: University of British Columbia Press.

Dennison, J., & Gallagher, P. (1986). Canada's community colleges: A critical analysis. Vancouver: University of British Columbia Press.

Dickinson, G. (1972). Learning processes in ABE. In W. M. Brooke (Ed.), Adult basic education: A resource book of readings (pp. 229-241). Toronto: New Press.

Feng, F., & Hian, C. C. (1995). New directions for adult education programs in community colleges: A critical assessment. In C. Danis & M. Hrimech (Eds.), Proceedings of the 14th Annual Conference of the Canadian Association for the Study of Adult Education (pp. 88-92). Montreal: Concordia University.

Gallagher, P. (1986). Promise fulfilled, promise pending. In J. Dennison (Ed.), Challenge and opportunity: Canada's community colleges at the crossroads (pp. 256-274). Vancouver: University of British Columbia Press.

Gosling, L. (with Edwards, M.). (1995). Toolkits: A practical guide to assessment, monitoring, review and evaluation. London, ON: Save the Children.

Grotelueschen, A. D., Gooler, D. D., Knox, A. B., Kemmis, S., Dowdy, I., & Brophy, K. (1974). An evaluation planner: A guidebook for developing evaluation plans responsive to a variety of contexts, audiences, and issues within adult basic education. Urbana-Champaign: College of Education, University of Illinois.

Grow, G. O. (1991). Teaching learners to be self-directed. Adult Education Quarterly, 41(3), 125-149.

Guba, E. G. (1978). Toward a methodology of naturalistic inquiry in educational evaluation. Los Angeles: Center for the Study of Evaluation, University of California.

Guba, E. G., & Lincoln, Y. S. (1983). Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches. San Francisco: Jossey-Bass.

Guba, E. G., & Lincoln, Y. S. (1989). Fourth generation evaluation. Newbury Park, CA: Sage.

Guglielmino, L. M., & Guglielmino, P. J. (1982). Learning style assessment. Boca Raton, FL: Guglielmino & Associates.

Herman, R. (1993). Planning for learning: A model for creative decision making. In T. Barer-Stein & J. Draper (Eds.), The craft of teaching adults (2nd ed.) (pp. 165-183). Toronto: Culture Concepts.

Hiemstra, R. (1994). Self-directed learning. In T. Husen & T. N. Postlethwaite (Eds.), The international encyclopedia of education (2nd ed.) Oxford, UK: Pergamon Press.

Houle, C. O. (1972). The design of education. San Francisco: Jossey-Bass.

Houle, C. O. (1988). The inquiring mind (2nd ed.). Madison: University of Wisconsin Press.

Johnston, R. (1992). Evaluation: The problem that won't go away. International Journal of University Adult Education, 31(1), 63-74.

Knowles, M. S. (1980). The modern practice of adult education: From pedagogy to andragogy. Englewood Cliffs, NJ: Cambridge.

Knox, A. B. (1986). Helping adults learn. San Francisco: Jossey-Bass.

Kulick, J. (1972). ABE: A historical perspective. In W. M. Brooke (Ed.), Adult basic education: A resource book of readings (pp. 1-9). Toronto: New Press.

MacKeracher, D. (1994). Partnerships in the provision of academic upgrading programs in New Brunswick. In R. Coreau, J. Dawson, & B. Signaty (Eds.), Proceedings of the 13th annual Conference of the Canadian Association for the Study of Adult Education (pp. 274-279). Vancouver, BC: Simon Fraser University at Harbour Centre.

MacKeracher, D. (1996). Making sense of adult learning. Toronto: Culture Concepts.

McLeod, B. (1996). Education versus training: Modular instruction in Nova Scotia. In B. Kops & B. Luterback (Eds.), Proceedings of the 15th Annual Conference of the Canadian Association for the Study of Adult Education (pp. 202-209). Winnipeg, University of Manitoba.

Merriam, S. B., & Brockett, R. G. (1997). The profession and practice of adult education. San Francisco: Jossey-Bass.

Nesbit, T. (1995). Lost in space: Mathematics education for adults. Proceedings of the 36th Annual Adult Education Research Conference (pp. 229-234). Edmonton: University of Alberta.

Nesbit, T. (1998). The social reform perspective: Seeking a better society. In D. D. Pratt (Ed.), Five perspectives on teaching in adult and higher education (pp. 173-199). Malabar, FL: Krieger.

Owen, S. L. (1986). Organizational culture and community colleges. In J. D. Dennison (Ed.), Challenge and opportunity: Canada's community colleges at the crossroads (pp. 141-168). Vancouver: University of British Columbia Press.

Patton, M. Q. (1997). Utilization-focused evaluation: The new century text (3rd ed.). Thousand Oaks, CA: Sage.

Quigley, B. A. (1992). The disappearing student: The attrition problem in adult basic education. Adult Learning, 4(1), 25-26, 31.

Quigley, B. A. (1997). Rethinking literacy education: The critical need for practice-based change. San Francisco: Jossey-Bass.

Scriven, M. (1991). Evaluation thesaurus. Newbury Park, CA: Sage.

Vella, J. (1994). Learning to listen, learning to teach: The power of dialogue in educating adults. San Francisco: Jossey-Bass.

Waite, N. (1972). ABE methods. In W. M. Brooke (Ed.), Adult basic education: A resource book of readings (pp. 199-228). Toronto: New Press.

Wlodkowski, R. J. (1999). Enhancing adult motivation to learn: A comprehensive guide for teaching all adults (2nd ed.). San Francisco: Jossey-Bass.

Appendix A

Continuing Student Questionnaire, January, 2000I. Learning Style Questions

1. Do you enjoy reading?

I don't like to read I hate to read, but I do read some

I read occasionally I love to read

2. How do you prefer to learn? Please choose the **2 favorite ways** you like to learn. Number your **most favorite** way with the number "1," and your **second** favorite with the number "2."

By reading

By doing

By watching

By thinking about something for a while

By listening

By talking to others

I can't pick a favorite way. I prefer a **combination** of ways (Please list them here)

3. Do you like to work on your own? Yes No

4. Do you need a quiet setting in order to do your work? Yes No

5. What is your long-term goal?

6. How will you use what you learned from the math course you completed last semester?

II. Course Information Questions

1. Had you expected the course you completed last semester to be:

Easier _____ It was the way I expected it to be _____ Harder _____

2. Overall, what is your feeling about the course you just completed?

I really enjoyed it _____ It was OK _____ I hated it _____

3. Did you read and study your course outline? Yes _____ No _____ Very little _____

4. Did you know that you could ask an assistant or another instructor in the math lab for help if your instructor was busy? Yes _____ No _____

5. Were you comfortable leaving your work area to go to an instructor's desk for help?

Yes _____ No _____

6. Were you comfortable asking the instructors and assistants for help?

Yes _____ No _____

7. Did you think the math lab was adequately staffed?

_____ Yes, there is always help available when I need it
 _____ Staffing is OK. Sometimes you have to wait a few minutes for help
 _____ There is not enough staff and I always have to wait a long time to get help

8. Did you know you could ask for extra help at a time other than your scheduled class time?

Yes _____ No _____

9. Did you spend extra time in the math lab, other than your scheduled time?

Yes _____ No _____

10. **If you used the computers to learn math**, did you find practicing math on the computer helpful? Yes _____ No _____ I never used the computer _____

11. **If you used the PLATO system**, did you enjoy learning math in this way?

Yes _____ No _____ I never used PLATO _____

III. Questions Regarding the Modules

1. Were the modules written in easy-to-understand language?

Yes _____ Sometimes _____ No _____

Please give examples of specific modules (with course number & topic) which were **not** written in easy-to understand language.

2. Were the modules easy to follow? Yes _____ Sometimes _____ No _____

Please give examples of specific modules (with course number & topics) which were **not** easy to follow.

3. Were you able to learn primarily from reading the instructions and examples, completing the practice exercises, and correcting your own work?

Yes _____ Most of the time _____ No _____

4. Did you enjoy this way of learning? Yes _____ No _____

5. Were the exercises in the modules similar to the examples?

Yes _____ No _____

6. Did you write your exams on the recommended test dates?

_____ Always on time, or early

_____ Sometimes on the recommended dates

_____ Never on the recommended dates. I was always late.

IV. COMMENTS—Please write your comments on the back of this sheet—Thank you.

Appendix B

Continuing Student Focus Group Questions

I. Course Information Questions

1. Was there anything about the way the course was taught that surprised you?
2. What kinds of skills were expected of you in order to successfully complete the course?
3. Did you receive enough help in the course?
4. What made you decide it was time to seek help from an instructor or an assistant?
5. What kinds of information did you need?
6. What did you do if you didn't understand the explanation an instructor or assistant gave you?
7. What did you like about the course?
8. How could the course be changed to make it better?

II. Questions Regarding Modules

1. What did you like about learning math by using the modules?
2. What did you dislike about learning math by using the modules?
3. Did you find that the exercises were similar to the examples?
4. Did you find that there were major surprises on the tests that were not addressed in the modules?

III. Strategies for Success Questions

1. What strategies did you use to make sure you were successful in the course?
2. What would you tell new students to do in order to pass the course?
3. What would you tell new students to do to get a grade of 7 or higher in the course?

Appendix C

Questions for New Student Focus Group, January and March, 2000

(Questions in *italics* will be used in the follow-up session at the end of March)

Course Information Questions

1. Is there anything about the way the course is taught that surprised you? (Was the course what you expected it to be? In what ways?)
2. What do you think is expected of you to successfully complete the course?
3. What do you like about the course so far?
4. *Do you prefer to work with one instructor or assistant, or are you comfortable going to different individuals for help?*
5. *What do you do if you don't understand the explanation an instructor or assistant gives you?*
6. *What have you liked about the course you are taking?*
7. *How could the course be changed to make it better?*
8. *Do you think the math lab is adequately staffed?*
 Yes, there is always help available when I need it
 Staffing is OK. Sometimes you have to wait a few minutes for help
 There is not enough staff and I always have to wait a long time to get help
9. *Are you comfortable having your instructor approach you at your work area?*
10. *If you are not comfortable, how would you prefer to get together to discuss your progress with your instructor?*

Questions Regarding the Modules

1. What do you like about learning math by using modules?
2. What do you dislike about learning math by using modules?
3. Did you find the modules easy to follow?
4. Are the exercises in the modules similar to the examples?
 Most of the time Seldom Always
5. Are there enough exercises to practice each new concept before going on to the next topic?
 There are not enough exercises
 The amount of exercises is just right
 There are too many exercises
6. *Are the exercises similar to the examples?*
7. *Are there major surprises on the tests that were not addressed in the modules? What were they?*
8. *Would you prefer to pay for each module (approximately \$5-\$8 per module) so that you can keep them as references, or are you happy renting them for \$15 per course?*

Appendix D**Questions for Instructors and Instructional Assistants
in the Math Instructional Group**

1. How long have you worked in the math lab?
2. What changes have you seen in the operation of the math lab compared to when you first began working in the math lab (Staffing, ratio of instructional staff to students, arrangement of classroom, skill level of students served, success rate of students, materials used, etc)
3. In your opinion, what works well in the math lab now?
4. What changes could be made in the math lab that could improve the chance of student success?
5. Please give some examples of students for whom the modularized math program worked well. How did it work well for them?
6. Please give some examples of students for whom the modularized math program did not work well. (How are you defining "did not work well?")
7. How well do you think the needs of the students are being met by the current system?

Poorly

OK

Very well

ADDITIONAL COMMENTS:
