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**THE USE AND VALUE OF A COMPUTER SELF-ASSESSMENT PROGRAM
AS PERCEIVED BY MICHIGAN FIELD-BASED EXTENSION EDUCATORS**

By

Guilin Cui

A DISSERTATION

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

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Department of Agricultural and Extension Education

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ABSTRACT

THE USE AND VALUE OF A COMPUTER SELF-ASSESSMENT PROGRAM AS PERCEIVED BY MICHIGAN FIELD-BASED EXTENSION EDUCATORS

By

Guilin Cui

This study investigated Extension educators' use and value of the C-CAP (Core Competency Assessment Program) computer program. The research questions were: 1. In what ways is C-CAP used? 2. What are the strengths and weaknesses of C-CAP as seen by its users? 3. In what ways does C-CAP improve the competency of Extension educators? 4. In what ways can C-CAP be improved to help Extension educators achieve career and personal success?

Seventy nine subjects were randomly identified and invited to participate in this study. Of this group, 31 signed the consent forms and agreed to participate. Finally, 24 returned the survey questions. Eighteen of them completed the whole survey. The study is based on the findings from this group.

Conclusions reached are: 1. It is possible to develop a computer-based self-assessment program to facilitate the learning of Extension field staff; 2. Maintaining privacy is not an important concern of the program user; 3. The instruction manual was an important feature; 4. Feedback to the user is important; 5. The investment in a self-assessment computer program for Extension field staff

is a good choice; 6. It may be necessary to accompany the general dissemination of C-CAP with an extensive promotional program; 7. It is difficult for respondents to differentiate between providing feedback on the medium rather than the content of the self-assessment.

Recommendations are: 1. The manual for C-CAP be rewritten with the views of the user clearly in mind; 2. Computer programs such as C-CAP can become a viable development focus for university-based organizations such as Extension; 3. The examination of the medium and the content of a computer program should not be assumed to be separate and non-interacting functions; 4. Other areas of Extension practice should be identified and examined for potential implementation through a computer self-assessment procedure; 5. It is important to examine research of this nature throughout the beginning stages and to periodically decide to proceed as planned or to make changes in the plan; 6. Steps be taken in the redesign of the C-CAP program to compensate for the inability of some subjects to remember their password; 7. Future research of this nature focus more on a qualitative approach to build a stronger foundational view.

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CHAPTER I

STATEMENT of PROBLEM

Introduction

With the development of modern technology, people need to learn more and more in order to adapt to society and contribute to it. Because time is a limited commodity, gaining more knowledge in a set amount of time and at the lowest cost is a very critical issue. The computer has become a good facilitator, helping people obtain this goal. Considering that advancements in computer technology have revolutionized education and the work force, the growing use of computers in business, industry, and education, along with the demand for increased educational productivity, has made the acquisition and efficient use of computer skills of primary importance in society today. The computer can help adults learn while providing the following advantages:

1. Unlike regular students, adult learners are usually very busy, having little or no time to attend regular classes to learn new technology and obtain more knowledge. With computer programs available now, people can learn at their convenience. Moreover, the computer can “provide individualized instruction; it’s more accurate, it’s more patient, and it lets the student progress at his own pace” (Hernandez-Logan, Carmela. 1982).

2. According to adult learning principles, people feel embarrassed when asked questions about topics with which they are unfamiliar. But with the facilitation of the computer, they are more likely to feel comfortable and confident answering questions, knowing the computer never laughs at them for giving incorrect answers. Therefore, computer programs can motivate people to learn.

3. With current economic developments, manpower has become more and more expensive. However, as computers become cheaper and more accessible, adults who use computers to learn, need only to be provided with well developed computer programs. If such programs can motivate adults to learn, enhance their competency and give them feedback, computers could be the cheapest mode of instruction for adults.

This is especially appropriate for Extension educators because the increasing technological sophistication of this society requires them to master a variety of complicated subjects, and an increased set of sophisticated skills, and to perform these skills at higher standards of performance. In the field of Extension education, competency has become a very important subject, focusing on two aspects: measurement and improvement of competency among Extension educators. Traditionally, in order to measure Extension educators' competency, answer sheets were prepared, including questionnaires related to what Extension educators should know. The questionnaires were prepared by several experts of

the State whose services usually cost a lot; they were administered inefficiently, and were hard to keep track of from evaluation to evaluation.

In view of these facts and the above listed advantages of computer facilitated adult learning, Michigan State University Extension set up a committee in 1992 lead by Dr. S. Joseph Levine to investigate areas of competency needed for Extension educators. The committee developed a list of ten areas of competency (Core Competencies for Extension Service Professionals: Selected Resource Materials for the MSU-E Core Competency Development Team) as well as a computer program - the Core Competency Assessment Program (C-CAP), (Levine, S. Joseph). C-CAP was created by taking content that had already been defined, developing a computer-based self-assessment framework, and organizing the content in the computer-based self-assessment framework to yield an instrument.

This study investigates the value of the C-CAP as expressed by C-CAP users, and the specific uses to which they adapt C-CAP.

Theoretical Foundations of the Study

Since the establishment of the Smith-Lever Act, Extension educational programs have been developed and improved in order to meet the needs and interests of the clientele. An essential component of Extension education is a group of staff who have excellent competencies. The nature of Extension

education is such that it utilizes the specific knowledge, skills, competencies and attitudes of the staff. Knowledge competency in agriculture, resource development, home economics, and Extension administration, as well as communication skills, are the most important competencies for Extension field staff.

Extension field staff need competency in specific areas in order to serve their clientele better. Maunder (1972) wrote:

All extension workers require special knowledge or competency in a number of broad areas. While each employee has special training needs according to his own requirements, knowledge and understanding is needed by all in the following areas:

1. Technical subject matter
2. Extension service organization and operation
3. Human development
4. Program development
5. The educational process
6. The social system
7. Communication
8. Research and evaluation

Each Extension field staff member has his/her own particular area of responsibility. Each staff member chooses a specific area in which to take responsibility and show competency. Maunder (1972) outlined six such competencies as:

1. Establishing one's self in job performance
2. Achieving team status
3. Achieving organizational mindedness
4. Becoming management conscious

5. Achieving a professional attitude
6. Making way for one's own replacement

Within the organization of the Cooperative Extension Service, Extension field staff function as on-line facilitators and work directly with their clientele. Knowles (1980) describes a number of principles of adult learning which are appropriate for Extension educators. These principles include the concept of helping learners diagnose their needs, planning with learners a sequence of experiences that will produce desirable learning, creating conditions that will cause learners to want to learn, selecting the most effective methods and techniques to produce the desired learning, providing the human and material resources necessary to produce the desired learning, and helping learners measure the outcome of their learning experiences.

This study uses Knowles principles of adult learning to investigate how Extension educators use and value C-CAP. It was felt that the Extension educators' perceptions and evaluations were of value to the Core Competency Assessment Program Development Committee.

Research Questions

Computer programs help learners obtain current knowledge and the C-CAP program was developed for improving and measuring Extension field staff competency. Of primary concern to this study are the following four research questions:

1. In what ways is C-CAP used?
2. What are the strengths and weaknesses of C-CAP as seen by its users?
3. In what ways does C-CAP improve the competency of Extension educators?
4. In what ways can C-CAP be improved in order to help Extension educators achieve career, and therefore, personal success?

Research Methodology

The research methodology used in this study reflects a descriptive approach. The sample that was surveyed consisted of those Extension field staff members who were full time employees and who spent at least twenty-five percent of their work time providing educational services in their counties. The C-CAP program was sent to these Extension field staff members who were instructed to use C-CAP for a period of 10 weeks. Then, a questionnaire was sent to them which asked how much value C-CAP was to them and how they used C-CAP. While a self-reporting instrument, such as a questionnaire, has certain limitations (Cronbach, 1960), the Extension field staff were asked to use the questionnaire as a way to document their use of C-CAP and the value they placed on C-CAP.

The items on the questionnaire fell under three categories as follows:

1. the first general area focused on characteristics of Extension field staff (Demographic Information).

2. the second area of questions focused on the usage of C-CAP, including how, where, and how many hours were spent using C-CAP.

3. the third area of questions focused on the value of C-CAP and how it may improve the competency of the user. These questions included feelings about C-CAP, and whether it is worthwhile to use C-CAP.

The survey results were analyzed through the use of statistical package for the social sciences (SPSS) and Microsoft Excel.

Assumptions

In conducting the research for this study, the following assumptions were made:

1. The participants' responses to the questionnaire reflect their true reactions regarding the use and value of the C-CAP program.

2. The questionnaire's construction, content and sample testing are appropriate for the research.

3. The sample chosen for this research truly represents the whole Extension field staff of the state of Michigan.

4. Extension educators are willing to participate in the study and will actually use the C-CAP program during the trial period.

Importance of the Study

C-CAP is a computer program that was developed by the Core Competency Development Committee of the Michigan State University Extension. It is important for both the C-CAP development committee and the Extension field staff to know whether or not C-CAP actually meets the development needs of Extension professionals. Knowing whether C-CAP is useful and valuable or not will assist in the development of the C-CAP program in the future.

Definition of Terms

Cooperative Extension Service (CES): An organization with a unique partnership between the federal government, state government, educational institutions, local governments and the people of the United States that provides a direct educational link with local communities. In Michigan, the Cooperative Extension Service offers non-formal educational programs in three areas: Agriculture and Natural Resources, Economic and Community Development, and Children, Youth and Family programs. The Cooperative Extension Service of Michigan has recently begun to use the name Michigan State University Extension (MSU-E). The Cooperation Extension Service, though located in conjunction with institutions of higher education, is different from University

Extension. University Extension defines the off-campus academic offerings of higher education institutions and is not a part of this study.

Core Competency Assessment Program (C-CAP): A computer-based self-assessment program which assists Extension field staff in assessing their competency in ten specific areas. Different screens from the C-CAP program are presented in Appendix C.

Extension Field Staff: Michigan State University Extension county agents, including 4-H youth, home economics, agricultural and natural resources, and public policy agents. They are employed by Michigan State University Extension and work at the county level educating people through the diffusion of useful and practical information. Extension agents are assigned according to the major program area. This study involves only those staff members who are employed full time and spend at least 25% of their time providing educational services in the county.

Limitations of the Study

This study is subject to the following limitations:

1. The extent of data collection will be influenced by the amount of time available to the researcher for selecting the samples and collecting data.

2. The participants who respond to the questionnaire are providing a subjective report of their perceptions. Because every one has his/her bias toward C-CAP, misunderstandings may affect the nature of C-CAP.

3. The instrument's ability to truly assess an extension agent's use and valuing of C-CAP is not perfect. Because the instrument was designed by the researcher, it will not be easy to assess the C-CAP program use and value objectively.

In addition, this study has been extremely limited due to the very small size of the sample, the large percentage of non-respondents and the very nature of the study since it is exploratory in nature. Exploratory studies of this type are designed to provide an initial understanding of a concept or practice rather than designed to make definite decisions.

Organization of the Dissertation

Chapter I of this study provides an overview of how the C-CAP program was examined by a descriptive study of users. A description of the theoretical foundations for the study, its importance and limitations, as well as the research questions posed and a definition of the terms is presented.

Chapter II provides a summary of the theoretical and conceptual foundations gleaned from literature relating to adult learning roles. This chapter

also includes a review of literature pertaining to related studies about extension competencies, and roles of software design, in general.

Chapter III describes the procedures used in planning and conducting the research.

Chapter IV contains the findings of the research with reference to the specific descriptions of the use and value of the C-CAP program by Extension field staff.

Chapter V presents the summary and conclusions of this study based on the data obtained. Implications are drawn, with specific suggestions for the improvement of the C-CAP program and for future research in this particular area as well.

CHAPTER II

LITERATURE REVIEW

This study is a description of both the usage and value of the Core Competency Assessment Program (C-CAP) developed by Michigan State University Extension field staff. The theories of this study are based on a review of pertinent literature related to (a) learner motivation and principles of adult learning, (b) learner characteristics and principles of adult learning, (c) competencies for extension educators, and (d) design and development of computer programs. Each of these four areas is reviewed and organized separately. A hierarchically organized review provides the reader with a clear view of the study and how it moves from the theoretic stage, to the design stage, and then to the implementation stage.

Learner Motivation and Principles of Adult Learning

Motivation has been defined as "an act or activity by one person designed to stimulate or arouse a state within a second person or group of persons that under appropriate circumstances initiates or regulates activity in relation to goals; or, is the aroused state of the individual that under appropriate circumstances initiates or regulates behavior in relation to goals," (Klausmeier,

1961). Motivation helps to explain different aspects of human behavior and it is believed to be a vitally important factor in various types of Extension programs that involve professionals and laymen (Lewis, 1972. and Quartrick, 1965).

Traditionally, motivation can be divided into intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to content factors, and is inherent in either the task itself or the student himself. Intrinsic motivation is the basis of most modern educational theories concerning activity and discovery, since exploration and curiosity are intrinsic to most people. And extrinsic motivation, which refers to context factors, is imposed on the task or the student by a teacher or other external agent. Extrinsic motivation usually takes the form of rewards or punishments of one type or another. Although most teachers focus on extrinsic motivation, in adult education, intrinsic motivation is more important. Morrison and McIntyre (1969) argue that most teachers tend to be more interested in extrinsic motivation; a concern that is apparent, for instance, in the perennial arguments over the place of punishment and other classroom sanctions. Accordingly, the real power of intrinsic motivation has often been overlooked or too readily associated with permissive styles of teaching. One way to talk about intrinsic rewards is in terms of the kinds of needs that motivate people, (Quarrick

et al. 1965).

Maslow (1954) offers a theory of human motivation based on a hierarchy of needs which he defines as:

1. Physiological needs (e.g. thirst, hunger, sex)
2. Safety needs (e.g., survival, security, order)
3. Love and Affection needs (e.g., identification, friendship, love)
4. Esteem needs (e.g., success, self-respect, confidence)
5. Self-actualization needs (e.g., desire to fulfill oneself)

The physiological needs are the basic needs which must be attended to before a person can cope with safety needs. The need for self-actualization manifests itself in a desire for self-fulfillment, for becoming what one has the potential to become. These needs are hierarchical, but "people who are normal are partially satisfied in all their basic needs and partially unsatisfied in all their basic needs at the same time," (Maslow, 1954). It is interesting to note that Maslow felt that self-actualization was only possible in adulthood:

"Self-actualization does not occur in young people. In our culture, at least, youngsters have not yet achieved identity, or autonomy, nor have they had time enough to experience an enduring, loyal, post-romantic love relationship ... Nor have they worked out their own system of values; nor have they had experience enough (responsibility for others, tragedy, failure, achievement, success) to shed

perfectionistic illusions and become realistic; nor have they generally made their peace with death; nor have they learned to be patient; nor have they learned enough about evil in themselves and others to be compassionate; nor have they had time to become post-ambivalent about parents and elders, power and authority."

What Maslow is speaking of here is the accumulation of experience that not only serves to define the individual person, but also can, as Knowles pointed out, be used as a resource for learning activities. The self-concept of an adult, more independent than that of a child, has evolved from experience, which in turn can assist them toward even greater self-direction or self-actualization.

To a very large extent, intrinsic motivation is associated with Maslow's two higher order needs, whereas extrinsic motivation is associated with his three lower order needs.

Davies (1973) states that Maslow's classification is of obvious interest to a classroom teacher, but it fails to indicate which strategies are likely to be optimal in fulfilling human needs. Furthermore, there is an important difference between Maslow's first three needs, and the two higher order needs for esteem and self-actualization. It is useful, therefore, to distinguish between two general classes of motive in terms of the strategies involved in realizing them.

Learner Characteristics and Principles of Adult Learning

Adult learning is significantly different from teaching children, as are the terms that define andragogy and pedagogy, respectively. The use of the word andragogy has been traced back as far as 1833, but Malcolm Knowles is generally credited with the popularization of the term and the concept in the United States. Knowles (1970) defines andragogy as "the art and science of helping adults learn" and contrasts it with "pedagogy" which is concerned with the teaching of children. According to Knowles (1970), andragogy is premised on at least four crucial assumptions about the characteristics of adult learners that are different from those of child learners, on which traditional pedagogy is premised. These assumptions are that, as a person matures, (1) his self-concept moves from one of being a dependent personality toward one of being a self-directing human being, (2) he accumulates a growing reservoir of experience that becomes an increasing resource for learning, (3) his readiness to learn becomes oriented increasingly to the developmental tasks of his social roles, and (4) his time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his orientation towards learning shifts from one of subject centeredness to one of problem centeredness.

These assumptions encapsulate much that is important about adult

learning and development. The first two assumptions, that adults are independent beings and have forged their identities from unique personal experiences--are drawn from humanistic philosophy and psychology and readily generate implications for adult learning. The third and fourth assumptions, dealing with the adult's readiness and orientation to learning, provide the links to understanding adult learning from a psychosocial developmental perspective. Some knowledge of both the humanist and developmental orientations, when combined with principles related to the learning process itself, can offer the adult educator an understanding of the complex interrelationship between adulthood and learning.

Self-direction, or independence, is believed to be the most significant characteristic of adults learners. Adult learners have different experiences throughout their lives, they come back to learn because they may meet challenge or want to change work conditions. Knowles (1975) indicates that in its broadest meaning, self-directed learning describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. "In most instances in which adults purposefully engage in systematic and sustained learning activities, their intent is to modify performance. Their reasons for engaging in the learning activity and their

anticipated uses of the new learnings are typically related to a coherent area of activity or performance," (Knox, A. B 1977). Knox (1977) also states, "Because adults typically want to use what they learn soon after they learn it, it is usually easy to establish the connection between specific learning activities and area of performance to which the new knowledge is to be applied."

Such characteristics attribute to the difference between self-directed learners and teacher-directed learners. Because adults engage in a learning activity on a self-directed basis, their own expectations provide the primary guide to activity, and other people serve mainly as sources of encouragement and learning resources, (Tough, 1967, 1971).

The other important characteristic of adult learners is experience. Usually, when an adult sets out to learn about something, it is largely related to the amount of experience and information that the adult already possesses. Knox finds that, "The adult's motivation and cooperation in the learning activity is more likely when the tasks are meaningful and of interest to the learner. Active interest and participation are more likely when the learner helps identify objectives, selects learning tasks, and understands procedures," (Knox, A. B 1977). If adults understand major aspects of a topic, they are more able to relate it to what they already know and to accumulate additional knowledge.

Besides self-direction and experience, adult learners display characteristics in four other areas as well: efficiency, feedback, achievement and physical conditions.

Efficiency

Unlike school children who spend many years in school, the adult is only willing to commit to short term experiences, a number of weeks rather than a number of years. The content of learning is related to the particular problem or workshop which solves a specific issue. Adults learn more effectively if they can participate, control the environment, or select their own learning resources.

Efficiency is the key issue to motivate these learners. Tough (1971) found that efficiency is often the most important criterion in selecting the planner for learning activities. When adult learners begin to learn, the first question the learner is likely to ask himself or herself is: What is the fastest, easiest, cheapest way for me to learn whatever I want to learn? The choice of the planner depends heavily on the answer to that question. Knox (1977) states the following characteristics a planner must emphasize:

1. Ability,
2. Clarify of Structure,
3. Memorable Encounters,
4. Personal Pacing,
5. Varied Resources.

Feedback

Learning persistence and effectiveness are enhanced if adults can obtain feedback about (1) the things they are learning, and (2) the extent and type of change in competency that results from educative activity. This feedback can result from test situations, comparisons with external standards, and reactions by peers (Belasco and Trice, 1969).

Feedback about current performance helps learners evaluate themselves on a scale of progress in the educational activity. This is especially important, because objectives are often broad and progress gradually. Immediate feedback, recognition, and rewards help shape and reinforce new learning. Feedback also helps preserve the persistence of adults learners, because in a learning activity, persistence is encouraged by a sense of progress in closing the gap between current and desired competency and in redefining, and sometimes extending, the reference point of desired competency. Information about excellent performance helps clarify goals for learning efforts. Positive reinforcement or reward is far more effective than negative reinforcement or punishment.

Achievement

Adults who engage in intentional learning, whether they do so on a self-directed basis or through participation in an educational program, usually do so

with an orientation towards an application of the increased competency. For almost all adults, and almost all learning tasks adults are likely to undertake, successful achievement is a function of perseverance (Sjogren, 1967).

Physical conditions

Physical conditions including location, time of day and length of sessions have a great influence on what tools one can and cannot use. If a meeting room has fixed chairs, there will be obvious problems in using small group discussions (with the exception of diads and triads). A room with an unusual shape may also be limiting. Cross (1986) states, "Of all the variables studied in connection with adult learning preferences, the matter of location illustrates better than any other the adage that people tend to like what they know rather than to know what they would like". In contrast, people say that convenience of learning location is important to them. And in recent years, educational providers have made considerable efforts in establishing convenient locations in shopping centers, work sites, downtown stores and businesses, and even mobile vans. Time of day influences the choice of tools. Work-weary participants coming to a class at day's end often require teaching tools that excite and involve them. A long boring lecture will promptly lull them to sleep, unless the topic is riveting. Using a variety of tools and changing the pace fairly often should be considered. The length of the sessions also influences which tools to choose. An all day workshop

provides a great opportunity for trying a variety of teaching tools, while an hour-long session is considerably more confining, (Apps, 1991).

Adult learners are concerned about efficiency, feedback, achievement, and physical condition. If these conditions are satisfactory to adult learners, they are more likely to be motivated, and their competencies improved.

Competencies for Extension Educators

Due to the rapid growth of new knowledge and technology, it is estimated that within 10 to 12 years of receiving their formal professional education, human service professionals will become approximately half as competent as they were upon graduation in meeting the demands of their profession, (Dubin, 1972).

Frandsen (1980) states that, "degree obsolescence is today's way of life. The 'half-life' knowledge in any given profession may now be as little as two to three years. The degree, in short, is today the beginning of the education of a professional." Therefore, there is no doubt that, to remain a competent professional, an individual must continually be involved in some type of learning.

Extension educators represent the state, the Land-Grant University and the Department of Agriculture at the county level in carrying on an educational program to improve public welfare, which involves agriculture and natural resources, home economics, 4-H youth programs and administration, community and business development, etc. Extension educators are the largest and most

important group in the Extension service. They are in constant contact with people in rural areas. Extension educators are in a strategic position to study the problems and to serve the needs and interests of thousands of families. In order to perform their duties effectively, Extension educators must gain appropriate competencies. Hyatt (1966) indicates that there are eleven general areas of competency relevant to the Extension educator's job, although different competencies are needed for different positions, and necessary for different programs. These competencies are as followings:

1. Extension workers need to understand the Cooperative Extension service, its objectives, organization, and relationship to the Land-Grant Institution.
2. Extension workers need to know and understand technical subject matter appropriate to their needs and the needs of people with whom they work.
3. Extension workers need to know and understand the principles and processes of programming and to have a high degree of proficiency in applying these concepts.
4. Extension workers need to know and understand the principles of learning and teaching and to have a high degree of proficiency in applying these principles.
5. Extension workers need to understand and to have a high degree of proficiency in the communication process.

6. Extension workers need knowledge about and understanding of the structure and dynamics of human society.

7. Extension workers need to understand human development processes and to maintain a high degree of skill in human relations.

8. Extension workers need to understand the principles of management and to attain a high degree of proficiency in applying these principles.

9. Extension workers need to be informed about current issues and problems confronting people and proficient in discussing them in an objective and informative manner with groups.

10. Extension workers need to understand the principles of administration and supervision.

11. Extension workers need to know, understand, and be proficient in applying the principles and techniques of evaluation.

Kelsey and Hearne (1963) state that county extension workers must have qualifications such as: background and experience which includes the concept of rural background, experience as a farm operator, homemaker or a 4-H member, teaching experience, experience in working with public; training which includes the concept of the minimum requirement being a bachelor's degree from an institution of recognized standing, special courses in extension work and related subjects, and high technical ability in a broad field; characteristics which includes the concept of teaching ability, ability to plan and cooperate with others, vision

and leadership, sympathetic attitudes towards associates, clear and systematic thinking, effective speaking and writing, tact and interest in people, enthusiasm with reliability, faith and courage, and integrity and dependability.

Several writers have researched the role of county extension educators in respective states. Schuster (1962) described the job of the county agricultural agent in Wisconsin by categorizing the various responsibilities into the areas of administration, programs development and implementation, personnel, office management, finance and public relations. Similar studies were made by Baker (1975), Swanson (1975), and Jahi and Newcomb (1981).

According to Swanson (1975), in order to meet professional standards, the extension worker, as an educator for the county, the Land-Grant College and the USDA, should:

1. be particularly skillful and proficient in his work.
2. have a strong sense of public responsibility.
3. place service to others higher in importance than personal gains.
4. be especially dedicated to one's job and what it stands for.
5. be essentially self-directing and self-motivated.
6. try to continually improve oneself.
7. be concerned about and work toward improvement of his colleagues' welfare.

8. work within acceptable ethical standards.

9. know and be familiar with professional literature of the field.

10. be willing to change methods of job procedure when new information based on research is received.

11. believe in the exchange of information.

12. use and understand the specific language employed in the profession.

Creek, et al. (1980) listed nineteen professional competencies to be used in an evaluation form for Extension interns, which includes appearance, speech, enthusiasm, responsibility, ability to work with others, leadership, flexibility, originality, administrative duties, reliability, knowledge of subject matter, instructor skill, neatness, extension planning and preparation, evaluation program ability, empathy, motivational ability of clients, responsibility to supervise, and professional potential.

Levine et. al. (1994) states the following thirty-one competencies in the Core Competencies For Extension Service Professionals: Selected Resource Materials for the MSU-E Core Competency Development Team:

1. Adult-Learning Understanding - Knowing how adults acquire and use knowledge, skills, attitudes. Understanding individual differences in learning.

2. A/V Skill - Selecting and using audio/visual hardware and software.

3. Career-Development Knowledge - Understanding the personal and organizational issues and practices relevant to individual careers.

4. **Competency-Identification Skill** - Identifying the knowledge and skill requirements of jobs, tasks, roles.
5. **Computer Competency** - Understanding and being able to use computers.
6. **Cost-Benefit-Analysis Skill** - Assessing alternatives in terms of their financial, psychological and strategic advantages and disadvantages.
7. **Counseling Skill** - Helping individuals recognize and understand personal needs, values, problems, alternatives and goals.
8. **Data-Reduction Skill** - Scanning, synthesizing, and drawing conclusions from data.
9. **Delegation Skill** - Assigning task responsibility and authority to others.
10. **Facilities Skill** - Planning and coordinating logistics in an efficient and cost-effective manner.
11. **Feedback Skill** - Communicating opinions, observations and conclusions such that they are understood.
12. **Futuring Skill** - Projecting trends and visualizing possible and probable futures and their implications.
13. **Group-Process Skill** - Influencing groups to both accomplish tasks and fulfill the needs of their members.
14. **Industry Understanding** - Know the key concepts and variables that define an industry or sector.

15. Intellectual Versatility - Recognizing, exploring and using a broad range of ideas and practices. Thinking logically and creatively without undue influence from personal biases.

16. Library Skill - Gathering information from printed and other recorded sources. Identifying and using information specialists and reference services and aids.

17. Model-Building Skill - Developing theoretical and practical frameworks which describe complex ideas in understandable, usable ways.

18. Negotiation Skill - Securing win-win agreements while successfully representing a special interest in a decision situation.

19. Objectives-Preparation Skill - Preparing clear statements which describe desired outputs.

20. Organization-Behavior Understanding - Seeing organizations as dynamic, political, economic, and social systems which have multiple goals; using this larger perspective as a framework for understanding and influencing events and change.

21. Organization Understanding - Knowing the strategy, structure, power networks, financial position, and system of a specific organization.

22. Performance-Observation Skill - Tracking and describing behaviors and their effects.

23. Personnel/HR-Field Understanding - Understanding issues and practices in other HR areas (Organization Development, Organization Job Design, Human Resource Planning, Selecting and Staffing, Personnel Research and Information Systems, compensation, and Benefits, Employee Assistance, Union/Labor Relations).

24. Presentation Skill - Verbally presenting information such that the intended purpose is achieved.

25. Questioning Skill - Gathering information from and stimulating insight in individuals and groups through the use of interviews, questionnaires and other probing methods.

26. Records-Management Skill - Storing data in easily retrievable form.

27. Relationship Versatility - Adjusting behavior in order to establish relationships across a broad range of people and groups.

28 Research Skill - Selecting, developing and using methodologies, and statistical and data collection techniques for a formal inquiry.

29. Training-and-Development-Field Understanding - Knowing the technological, social, economic, professional, and regulatory issues in the field; understanding the role T&D plays in helping individuals learn for current and future jobs.

30. Training-and-Development-Techniques Understanding - Knowing the techniques and methods used in training; understanding their appropriate uses.

31. Writing Skill - Preparing written material which follows generally accepted rules of style and form, is appropriate for the audience, is creative, and accomplishes its intended purposes.

Design and Development of Computer Programs

Increasingly, computers have become a part of skill training. Mozes (1987) indicates that certain characteristics of microcomputers make them well-suited for adult learning. Indeed, in some instances, characteristics of the adult learner that could not be observed using traditional teaching methods have become obvious through the use of microcomputers. Computers can be a powerful tool both to help the teacher and to enhance participant learning. People learn by interacting with a patient, never complaining, intelligent program which doesn't hinder their motivation. Information is presented on a screen, either in printed format or through graphic or audio media, or some combination of these forms. The learners, each working individually on a computer, answer questions or solve problems and receive immediate feedback. Learners can interact with the instructional material, proceeding at their own pace, (Apps, 1991).

One of the most important characteristics of adult learners is self-direction, which means, first of all, self-diagnosis of the need for learning. Adults, who know to some extent what their interests are, could certainly develop a full and competent list of their needs if properly helped. Such inquiries into an

individual's background, needs, and interests can be easily handled by the microcomputer. A well developed computer program can help individuals see the strengths and weaknesses of their performance, and thus, can use this knowledge to decide what they need to learn to increase competency.

Self-direction also means one has freedom to choose from among many learning experiences. A large number of professionals are unfortunately unable to benefit from traditional continuing education programs because of scheduling. There is a need to develop programs that allow for self-directed study. The computer can make a significant contribution toward this goal for three major reasons.

First, the computer provides a flexible source for teaching and learning, in terms of both place and time. Professionals can use computers programs at home, at work, or at any other location, at any given time, day or night. They can use a program at their own pace, interrupt it at any point, and continue from that point the next time they turn the computer on.

Second, taking into account the background and characteristics of the individual, the computer can provide a wide range of levels of difficulty on a given program. Tailoring a program to an individual's characteristics makes it more meaningful and acceptable, and increases the chance of successful completion.

Third, the computer can be used as a delivery system for an entire curriculum through the development of a large number of programs covering the entire range of learner needs and interests. The computer program can monitor, evaluate, advise and guide the learner. Mozes stresses that only a system having all or most of these characteristics can provide the learning environment needed by professionals which will allow them the freedom to choose from a large selection, the information or program preferred and presentation method preferred. All this is done while providing professionals, as needed, with information, feedback, and help to make these choices.

Self-direction also means self-evaluation. Adults should be given the opportunity to see for themselves how well they are progressing toward their learning goal. One of the general characteristics of continuing education in the professions is the push for continuous self-evaluation activities on the part of the professional. Most educators think that self-evaluation is not only a tool, but a general attitude, a way of life for the professional, and should become second nature to all professionals. The computer, when requested to do so, can collect and provide a host of data regarding learning performance. Comparisons can be made between performance at the beginning and at the end of the learning sequence, or between present competencies and the required competencies. The computer can also provide constant and immediate feedback during the learning process.

The idea of letting adults decide what their needs are makes sense, not only because this is part of the drive behind self-directed learning, but also because, as a result of this decision making, they are more motivated to learn.

Adults bring a very valuable resource into the teaching/learning process-- their own experiences. Computers programs should take these experiences into consideration and should build upon them. Moreover, adults tend to view educational activities from a problem-centered point of view, mainly because they seek immediate applications of the knowledge and skills learned, applications that are usually related to their work or their lives. This characteristic requires the use of those teaching/learning techniques that are action-oriented, that emphasize problem solving. Furthermore, although evaluation is an issue less related to the characteristics of the adult learner and more related to the way learning activities are organized, a good computer program should include evaluation. The evaluation results can provide incentive for participants to do their best.

As modern technology beckons more and more educational institutions to invest in computers for instructional and educational purposes, and therefore, the increased use of computers, skills needed for the design and development of effective computer technology and good educational programs are required. Ould and Sneed (Ould 1990, Sneed 1989) suggest that computer program quality can be measured with the 10 following indices: functional completeness,

reliability, security, user friendliness, efficiency, maintainability, extensibility, portability, interface ability, and documentation.

Functional completeness is the extent to which a software system meets its requirements and is divided into informational completeness and procedural completeness. Informational completeness means that all the results or output data requested by the user are actually produced. Procedural completeness means that all the actions and conditions requested by the user are actually carried out.

Reliability entails the user being able to use the program and get correct results, this always being the main goal of the program developer. It includes correctness and robustness. Correctness is the relationship between the number of correct or error-free transactions and the number of normal transactions. A correct transaction is one which develops as expected and produces a correct result. Robustness is the relationship between the number of transactions handled correctly and the number of all abnormal transactions, i.e. transactions with incorrect inputs or exceptional cases. A correctly handled transaction will recognize the erroneous or abnormal situation and either correct or reject it.

Security is a software system's capacity to protect itself against external and internal disruption which includes data integrity and function integrity. Data integrity is the degree of protection against all wrong inputs. And function integrity means checking the execution of all functions.

User friendliness is a measure of how comfortable a user finds a system and can be determined by the ease of use and comprehensibility.

Efficiency means the optimal use of available computing resources. There are two sides of efficiency: time efficiency and space efficiency. Time efficiency means minimizing the time required by the software, and space efficiency means minimizing the space required by the software. Efficiency is dispensable for many applications.

Maintenance is the software's process of being responsive to user needs--fixing errors, or making user-specified modifications, honing the program to be more useful. Maintainability measures how simple it is to correct and change a software system. It is measured in terms of the original development expenditure. The smaller the expenditure on maintaining the system--relative to the expenditure on development--the greater the maintainability.

Extensibility is a measure of how easily new component modules, programs, files or data records can be introduced into an existing software system without having to change components already there.

Portability is the capacity to move program systems from one technical environment to another with a minimum of changes. The fewer the modules which are affected by the transfer, the better.

Although some people argue the computer's impersonal characteristics, the computer's usefulness and value in adult learning is unquestionable. Those of

who are in adult education cannot overlook the importance of microcomputers in our society, (Apps, 1982).

Every computer program performs some task correctly. What is of interest to computer scientists is whether a program performs its intended task. To determine this, a precise and independent description of the desired program behavior is needed. Such a description is called a program specification. Two major developments in technology during the past two decades are greatly influencing adult learning: (1) how information is stored and retrieved, and (2) how information is transmitted. Almost unlimited information is available in various electronic forms. Optically scanned information storage systems, such as CD-ROM, provide adult learners quick access to information. Some people prefer learning when they are talked to--that is, they enjoy a well-developed, carefully presented lecture. Still others prefer to learn visually; they enjoy films, video tapes, and other visual materials. Learning from words is often more difficult for them, particularly if no visual materials are included. Some prefer to learn by doing, a hands-on approach. If they can actually do something, whether it's practice on a computer or learn about group dynamics by practicing with a group, they prefer it. Adult learning consists of:

1. accumulation of information;
2. change in behavior;

3. improved performance or proficiency;
4. change in knowledge, attitudes, and skills;
5. a new sense of meaning;
6. cognitive restructuring;
7. personal transformation.

A well designed computer program must facilitate adult learners in obtaining these results. The good Extension educator must:

1. make certain learners know how to operate the computers.
2. be available to help learners who have difficulty with the computer's instructions.
3. be aware that not all participants learn equally well with interactive computer programs.
4. realize that some learners will take much longer than others to master the same skill.
5. allow them time to repeat the program until they have mastered the skill.

The good Extension educator must not

1. closely observe participants while they work.
2. encourage individual learners to cover the skill training in unison, as if they were a group.

3. make negative comments to participants who take longer to learn a skill.

Summary

In this chapter, a review of selected pertinent literature was presented. Those areas reviewed were: learner motivation and principles of adult learning, learner characteristics and principles of adult learning, competencies for extension educators, and the design and development of a computer program. The next chapter concerns the research methodology and procedures that were used in this study.

CHAPTER III

PROCEDURES AND METHODOLOGY

Introduction

This study is concerned with investigating how users of the C-CAP computer program use and value the C-CAP program. The following research questions guided the research:

1. In what ways is C-CAP used?
2. What are the strengths and weaknesses of C-CAP as seen by its users?
3. In what ways does C-CAP improve the competency of Extension educators?
4. In what ways can C-CAP be improved in order to help Extension educators achieve career, and therefore, personal success?

In this chapter, the development of C-CAP and the methodology and analysis processes used in the research are presented.

Development of C-CAP

Based on the study Core Competencies for Extension Service Professionals: Selected Resource Materials for the MSU-E Core Competency

Development Team, (Levine, et. al., 1994), the contents of the C-CAP program include the following ten areas of competency:

1. Professional and Career Development
2. Educational and Informational Technology
3. Written and Spoken Communication and Skills
4. Program Planning and Development
5. Program Implementation
6. Applied Research and Evaluation
7. Organizational Knowledge, Leadership and Management
8. Diversity and Pluralism
9. Marketing and Public Relations
10. Audience Identification and Development

Each area of competency includes 11 to 49 questions, and 2 to 5 answers related to each question. The guiding principles used during the development of the C-CAP computer program are as follows, (Apps, 1982):

1. make certain learners know how to operate the computers.
2. be available to help learners who have difficulty with the computer's instructions.
3. be aware that not all participants learn equally well with interactive computer programs.

4. realize that some learners take much longer than others to master the program until they have mastered required skills.

5. avoid making negative comments to participants who take longer to learn a skill.

C-CAP utilizes a user-friendly, menu-driven computer program approach. The C-CAP program actually consists of three sub-programs: one being the main program which instructs users to answer questions, the second for reviewing prior results, and the third, to process and print the output of C-CAP, including graphic output of scores and wrong answers. C-CAP screens are shown in Appendix C.

The C-CAP program utilizes the user's name and a user selected password for program security. A user's data can be accessed only by the individual who knows both the user's name and his/her password. It is assumed that such security would encourage users to describe their usage and valuing of C-CAP more honestly. When the user enters the correct name and password, the C-CAP program offers three choices for selection, including: (1) selecting one or more of the ten areas of competency and responding to the questions, (2) reviewing the previous results, or (3) quitting the C-CAP program.

The C-CAP program also takes into consideration the experience and competency of Extension field staff according to their service time with Michigan State University Extension and groups them into one of three stages:

1. Introductory Career Stage - Extension field staff who belong to this stage have worked for Extension less than 2 years.
2. Early Career Stage - Extension field staff who belong to this stage have worked for Extension more than 2 years and less than 6 years.
3. Continuing Career Stage - Extension field staff who belong to this stage have worked for Extension more than 6 years.

When users at different stages select the same answer to a particular question, their scores may differ due to the competency required at the different stages. C-CAP provides the user with a printout of the items that were answered incorrectly. A sample of such a printout is shown in Appendix D.

Methodology Design

The design chosen, according to the terminology used in Research in Education, (Best and Kahn, 1986), can be categorized as a descriptive study in the form of a mailed questionnaire.

A descriptive study describes and interprets what is. It is concerned with conditions or relationships that exist, opinions that are held, processes that are going on, effects that are evident, or trends that are developing, (Best and Kahn, 1986).

The data obtained from the completed questionnaires were used to describe how the study population is distributed for different variables. The

primary goals of this study were to provide data, draw conclusions, and describe how the C-CAP program is being used and how the Extension field staff value C-CAP. The survey method has been chosen for this study since it satisfied certain descriptive research aspects.

The survey method of research is an established strategy that offers many advantages. According to Babbie (1986):

“Survey research is probably the best method available to the social scientist interested in collecting original data for describing a population too large to observe directly. Surveys are also excellent vehicles for measuring attitudes and orientations in a large population (p.209).”

This study utilizes a descriptive survey methodology to collect information and ascertain the perceptions commonly held by the users of the C-CAP computer program regarding the use and the value of the program.

Instrumentation

The initial step toward the development of the instrument for this study was a review of literature. Studies by Knowles (1975) were especially important in considering items for inclusion in the research instrument.

The sample selected consisted of those Extension field staff who were full-time employees and who spend at least twenty percent of their assignments

providing educational services in their counties. Once the sample was selected, an initial invitation letter, duplicated on the Department of Agricultural and Extension Education, Michigan State University letterhead, and signed by the researcher, along with a consent form, was mailed to the subjects. The invitation letter outlined the reasons for the study, the nature of participation, confidentiality of responses, and usefulness of the study. The letter also asked the individual if they agreed with the invitation letter's statements to sign and return the Consent Form, informing the researcher of their willingness to participate in the study. In March, 1995, the C-CAP program, an operating manual and an instructional letter were sent to these individuals. They were instructed to use the C-CAP program for at least 10 weeks. These materials are shown in Appendix A. Then, a designed questionnaire and an extracting diskette used to collect practice data, were sent to each individual of the sample for surveying their use and valuing of C-CAP.

The designed questionnaire consisted of three sections: Section one solicited basic demographic information from the respondents which included their job title, program areas, service time with Extension, percentage of assignment providing educational services, mileage from home to office, and purpose for using a computer at home and office.

Section two focused on their usage of C-CAP. Extension field staff were asked to respond to twenty-two questions.

Section three solicited responses to items which were directed toward determining the value of C-CAP. Extension field staff were asked to respond to a five point Likert type scale for each item where 5 = Strongly Agree, 4 = Agree, 3 = Not sure, 2 = Disagree, and 1 = Strongly Disagree. The questionnaire is shown in Appendix B.

The second step in the process was the presentation of the survey questionnaire to a panel from the Core Competency Development Committee. Members of the Committee were asked to evaluate the instrument for format, clarity, and content. Then, the dissertation committee which is composed of four professors who are familiar with C-CAP and Michigan State University Extension, served to further verify the questions and content for the questionnaire. Each of them was asked to read the statements and make suggestions pertaining to wording changes in each statement. Suggestions from each professor on each questionnaire item were carefully studied. Changes in wording were made when two or more professors agreed to a change and suggested the same/similar wording for the change. Changes to the instructions and the format of the questionnaire were kept to a minimum.

A cover letter, signed by the researcher, accompanied the questionnaire. The letter outlined the reasons for the study, the nature of participation, confidentiality of responses, and usefulness of the study. Respondents were asked to make further suggestions and offer their perceptions of the usage and value of

C-CAP if they felt the questionnaire did not fully reflect their insights. They were also asked to sign their name on the postage-paid self-addressed return envelope. The cover letter was duplicated on the Department of Agricultural and Extension Education, Michigan State University letterhead. Necessary instructions on how to complete the survey and an explanation of the scale were also provided.

A field test of the survey questionnaire was also conducted using a focus group consisting of three Extension field staff who discussed with the researcher the data and conclusions. They also helped interpret the meaning and understanding of C-CAP.

Population

Identification of the survey population is a critical step in the research process. Two types of populations are generally described in the research literature: the “target” population and the “survey” population. According to Rossi, et al. (1983), the target population is the collection of elements that the researcher would like to study. The survey population is the population that is actually sampled and from which data may be obtained.

The target population for this study included all Michigan State University Extension field staff who are involved in the planning, implementation and evaluation of Extension education programs.

The Sample

Due to time and manpower limitations, it was beyond the scope of this study to provide coverage of the total population. In order to respond appropriately to the stated problem and provide answers to the research questions, a survey sample consisting of full-time employed MSU Extension field staff who provide educational service at least twenty five percent of their time in their counties, were considered for this study. A total of 79 subjects was randomly identified and invited to participate in this study. Of this group, 31 signed the consent forms and agreed to participate in the program. Finally, 24 returned the survey questions. One of them was no longer working for MSU-E, one of them said they did not have time, four of them answered demographic questions only and eighteen of them completed the whole survey.

A sample is a strategically and systematically identified group of people or events that meets the criterion of representatives for a particular study, (Merriam et. al, 1989). Several approaches to sampling are available depending on the nature and objectives of the research. As indicated earlier, the purpose of this research was to describe the use and value of C-CAP. There were 31 Extension field staff who agreed, and were expected to participate in the study, having responded to the survey.

An invitation letter signed by the researcher was the initial mailing to the subjects. The invitation letter outlined the reasons for the study, the nature of

participation, confidentiality of responses, and usefulness of the study. The letter asked the individual to complete and return an Agreement Form to signify their willingness to participate in the study. The invitation letter was duplicated on the Department of Agricultural and Extension Education, Michigan State University letterhead.

Data Collection

After the dissertation committee approved the research proposal, MSU approval from the University Committee on Research Involving Human Subjects (UCRIHS) was requested. After UCRIHS approved, approval from the MSU Extension Office was requested. After the MSU-E office approved, in March, 1995, the C-CAP program and an operating manual and an instructional letter were sent to those selected individuals who were then instructed to use C-CAP for at least 10 weeks. Then, a designed questionnaire and an extracting diskette were used to collect their practicing data, and a cover letter were sent to each individual of the sample for surveying their use and valuing of C-CAP. In order to facilitate individualization, the name and address of each respondent was printed directly on the cover letter. A stamped, self-addressed envelope was included with the questionnaire for follow-up mailing purposes. To increase the ease of completion, each part of the questionnaire was preceded by adequate instructions.

An invitation cover letter explained the purpose of the study and its importance for future usage of C-CAP. In addition the invitation cover letter included information required by MSU's University Committee for Research Involving Human Subjects (UCRIHS). The invitation letters, signed by researcher, were sent to the 79 selected subjects. If they agreed to participate in the survey research, they received C-CAP and were allowed to use it for at least 10 weeks.

After 10 weeks, a survey packet was sent which included a short cover letter, questionnaire, postage paid self-addressed return envelope, and an extracting diskette which was used to collect the practice data from each participant during their use of C-CAP. They were mailed to each member of the survey population using first class metered postage service, from East Lansing on June 20, 1995. An individual identification number was recorded on the first page of each questionnaire for follow-up mailing purposes. To increase the ease of completion, each part of the questionnaire was preceded by adequate instructions. A self-addressed stamped envelope was included with the questionnaire.

Initially, ten surveys were returned. The same cover letter, extracting diskette and questionnaires were sent to individuals who did not return the survey. Four more surveys were received. A month later, the second cover letter, extracting diskette, and questionnaire were sent to individuals who did not return the survey; four more were then received. In early September, the last cover

letter, extracting diskette, and questionnaire were sent to the remaining thirteen individuals who did not return the surveys. Six surveys were received. There were twenty-four field staff who eventually returned the survey.

Completed questionnaires were carefully checked upon return. All usable questionnaires were given a new identification number. The information was coded and entered into a microcomputer data file.

Data Analysis

The focal point of the research was to determine the use and the value of the C-CAP program as perceived by Michigan State University's Extension field staff.

Data on respondent demography were tabulated. Data gathered from those items requiring a quantity scale were analyzed utilizing the Microsoft Excel package. Means and percentages were derived.

Some data on usage of C-CAP were grouped according to different criteria and the rest of them were tabulated. Data gathered from those items were analyzed utilizing the Microsoft Excel package. Means, standard deviations, and percentages were derived.

Data on the value of the C-CAP program were tabulated. Data gathered from those items requiring a response to a five point Likert-type scale were

analyzed utilizing the Microsoft Excel package. Means, standard deviations, and percentages were derived.

Data on the extracting diskette were tabulated. The relationship between the value of C-CAP and demographic data and relationship between the value of C-CAP and the usage of C-CAP were analyzed utilizing the SPSS for Windows package. Correlation coefficient and T-tests were derived.

Summary

A variety of appropriate methods for examining the outcome of usage and the valuing of the C-CAP program by participants in Michigan State University Extension was described.

This chapter has provided an overview of the methods utilized including the context of the study, instrument development, and data collection.

Chapter IV presents the findings of the research.

CHAPTER IV

PRESENTATION OF FINDINGS

Introduction

In this chapter, the results of the data collected in the survey questionnaires are presented and summarized. The data collection was completed in accordance with the procedures identified in the previous chapter.

The data were collected through a survey of 31 MSU-E field staff . Twenty-four of the 31 returned completed surveys. This represents a return rate of 71%. The completed surveys (see Appendix A) were mailed to the Department of Agricultural and Extension Education in a pre-addressed stamped envelope. The field staff responded to the survey questionnaire by means of a modified Likert-type scale, rank ordered and/or open ended questions. The returned surveys were scrutinized by means of computer analysis using Microsoft Excel and SPSS, Statistical Package for the Social Sciences.

There were three general areas examined in this study. The first dealt with demographic information. The other two general areas reflected the research questions. These are:

1. How Extension field staff use the C-CAP program.

2. How Extension field staff value the C-CAP program.

This study is concerned with investigating how the users of the C-CAP computer program use and value the program. The following research questions guided the research:

1. In what ways is C-CAP used?
2. What are the strengths and weaknesses of C-CAP as seen by its users?
3. In what ways does C-CAP improve the competency of Extension educators?
4. In what ways can C-CAP be improved in order to help Extension educators achieve career, and therefore, personal success?

In the following pages, the findings of this study are presented. For the sake of clarity, the findings are presented in the general categories of the three areas previously discussed.

Population

The population for this study consisted of all the Michigan State University Extension field staff. Using the random selection method, 79 field staff were selected, of which 31 agreed to participate in the study. Of those, 24 returned the survey questionnaire. However, six of the returned survey questionnaires were incomplete and not useable: one participant no longer worked for MSU-E, one of them said he/she had no time to actually use C-CAP,

and four of them completed only the demographic section of questionnaire. This yielded a total of 18 useable survey questionnaires. In addition, the subjects were asked to return a diskette with their survey questionnaire that included certain files from the C-CAP computer program. A total of 14 of the 18 respondents returned the diskette also.

Respondent Characteristics - Demographic Variables

Throughout the survey questionnaire there were a number of items which provided insight into the sample.

Job Title

The respondents were asked to identify their current job title. Their responses are shown in Table 4.1.

Table 4. 1 What is your current job title?

Response Category	No. (%)
County Extension Director	7 (38)
Extension Home Economist	5 (28)
Extension 4 - H Youth Agent	2 (11)
Home Economist/Community Development/Land Use Agent	1 (6)
Community and Economic Development Agent	1 (6)
Extension Agriculture Agent	1 (6)
Resource Recovery Agent	1 (6)
Total	18 (100)

As is seen in Table 4.1, 38% were County Extension Directors, 27% were Extension Home Economists, 11% were Extension 4 - H Youth Agents, 6% were Home Economist/Community Development/Land Use Agents, 6% were Community and Economic Development Agents, 6% were Extension Agriculture Agents, and 6% were Resource Recovery Agents.

Program Area

The respondents were asked to identify their program areas. Their responses are shown in Table 4.2.

Table 4. 2 What is your program area(s)?

Response Category	No. (%)
Children Youth and Family (CYF)	9 (50)
Agriculture (AG)	3 (17)
Community and Economic Development (CED)	2 (11)
Home Economics (HE)	2 (11)
CED + AG	1 (6)
CED + HE	1 (6)
Total	18 (100)

As seen in Table 4.2, 50% were from the Children Youth and Family (CYF) area, 17% were from the Agriculture (AG) area, 11% were from the Community and Economic Development (CED) area, 11% were from the Home Economics area, 6% were from a combination of the Community and Economic Development (CED) area plus the Agriculture (AG) area, and 6% were from a

combination of the Community and Economic Development (CED) area plus the Home Economics (HE) area.

Years Worked for Michigan State University Extension.

The respondents were asked how many years they worked for MSU-E. Their responses are shown in Table 4.3.

Table 4. 3 How many years have you worked for MSU Extension?

Years Worked for MSU-E	N (%)
< 2 years	4 (22)
2 - 6 years	2 (11)
> 6 years	12 (67)
Mean	9.7 yrs
Standard Deviation	7.2 yrs

As seen in Table 4.3, the average length of time the respondents worked for MSU-E was 9.7 years. When the respondents are organized according to the C-CAP career stage , the data show that 22% worked for less than two years - Introductory Career Stage, 11% worked between two and six years - Early Career Stage; and 67% worked for more than six years - Continuing Career Stage.

Percentage of Assignment Providing Educational Services

The respondents were asked what percentage of their assignment with MSU-E was actually spent in providing educational services to clientele, rather

than supervising, administering, etc. Their responses are shown in Table 4.4.

Table 4. 4 What percentage of your assignment with MSU-E is actually spent in providing educational services to clientele (rather than supervising, administering, etc.)?

Percentage of Time Spent Providing Educational Service	N (%)
<25%	0 (0)
25% - 50%	6 (33)
51% - 75%	2 (11)
>75%	10 (56)
Mean	67.2
Standard Deviation	24.2

As seen in Table 4.4, the average percentage of time spent on education by respondents was 67.2%; 12 of them spent 50% or more of their time providing educational service.

Mileage from home to office

The respondents were asked how many miles they traveled from home to office. Their responses are shown in Table 4.5.

As seen in Table 4.5, the average mileage traveled by the respondents between home and office was 17.8 miles. The standard deviation was 18.3.

Table 4. 5 How many miles do you travel from your home to your office?

Miles Traveled Between Home and Office	N (%)
0 - 5 miles	6 (33)
6 - 10 miles	3 (17)
11 - 25 miles	3 (17)
26 - 50 miles	5 (28)
51 - 100 miles	1 (6)
Mean	17.8 miles
Standard Deviation	18.3 miles

Years used a computer

The respondents were asked how many years they had used a computer.

Their responses are shown in Table 4.6.

Table 4. 6 How long have you been using a computer?

Years used a computer	N (%)
0 - 5 years	5 (28)
6 - 10 years	9 (50)
> 10 years	4 (22)
Mean	8.8 yrs
Standard Deviation	4.3 yrs

As seen in Table 4.6, the average time field staff had used computers was 8.8 years; the majority of the respondents had used computers for over five years.

Using a Computer at Home

The respondents were asked if they used a computer at home. Their responses are shown in Table 4.7.

As seen in Table 4.7, 78% used a computer at home; 22% did not use a computer at home.

Table 4. 7 Do you use a computer at home?

Response Category	No. (%)
Yes	14 (78)
No	4 (22)
Total	18 (100%)

Purposes for Using a Computer at Home

The respondents were asked for what purposes they used a computer at home. Their responses are shown in Table 4.8.

Table 4. 8 Purposes for using a computer at home

Response Category	No. (%)
Word Processing	13 (72)
Games/Recreational uses	9 (50)
Educational/Learning uses	6 (33)
Accessing Information sources	5 (28)
Electronic Mail (E-Mail)	4 (22)
Connecting with bulletin boards	3 (17)
Spreadsheet	3 (17)
Database use	1 (6)
Other	3 (17)

As seen in Table 4.8, 72% used a computer at home for word processing purposes; 50% used a computer at home for games/recreational purposes; 33% used a computer at home for educational/learning purposes; 28% used a computer at home for accessing information sources; 22% used a computer at home for Electronic mail (E-Mail) purposes; 17% used a computer at home for connecting with bulletin boards; 17% used a computer at home for spreadsheet purposes; 6% used a computer at home for database purposes; and 17% used a computer at home for other purposes such as checkbook management, a spouse's business and reporting for consulting.

Assigned Own Computer at Office

The respondents were asked if they were assigned their own computer at the office. Their responses are shown in Table 4.9.

Table 4. 9 Are you assigned your own computer at your office?

Response Category	No. (%)
Yes	18 (100)
No	0 (0)
Total	18 (100%)

As seen in Table 4.9, 100% responded that they were assigned their own computer at their office.

Purposes for Using a Computer at Office

The respondents were asked for what purposes they used a computer at the office. Their responses are shown in Table 4.10.

As seen in Table 4.10, 94% used a computer at the office for word processing purposes; 78% used a computer at the office for database purposes; 72% used a computer at the office for Electronic mail (E-Mail) purposes; 56% used a computer at the office for educational/learning purposes; 44% used a computer at the office for accessing information sources; 28% used a computer at

Table 4. 10 For what purposes do you use a computer at your office?

Response Category	No. (%)
Word Processing	17 (94)
Database use	14 (78)
Electronic Mail (E-Mail)	13 (72)
Educational/Learning uses	10 (56)
Accessing Information sources	8 (44)
Spreadsheet	5 (28)
Connecting with bulletin boards	2 (11)
Games/Recreational uses	1 (6)
Other	3 (17)

the office for spreadsheet purposes; 11% used a computer at the office for connecting with bulletin boards; 6% used a computer at the office for games/recreational purposes; and 17% used a computer at the office for other purposes such as educational programs, graphic design and software programs, etc.

Total Hours per Week Using a Computer.

The respondents were asked how many hours per week they used a computer. Their responses are shown in Table 11.

As seen in Table 11, the average hours of computer usage by field staff each week was 11.2 hours. The majority of the respondents used a computer

Table 4. 11 How many total hours each week do you use a computer (at both home and the office)?

Total Hours Using a Computer per Week	N (%)
0 - 5 hours	5 (28)
6 - 10 hours	5 (28)
> 10 hours	8 (44)
Mean	11.2 hrs
Standard Deviation	7.0 hrs

more than 5 hours each week. The majority of the respondents had also used a computer for over five years in their career.

An additional analysis was done to compare the demographic information provided by the 6 respondents who did not actually use the program and the 18 respondents who used the program. These data are shown in Table 4.12.

As is shown in Table 4.12, there are two demographic areas that appear to differentiate between the 6 non-users and 18 users. The non-users apparently live considerably closer to their place of work. Additionally, the non-users seem to use their computers twice as much as the 18 users. This finding is very

Table 4. 12 Comparing the Demographic information of the 6 non-users of C-CAP with 18 users of C-CAP.

Demographic Information	6 non-users	18 users
How many years have you worked for MSU Extension?	10.5	9.7
What percentage of your assignment with MSUE is actually spent in providing educational services to clientele (rather than supervising, administering, etc.)?	51.7	67.2
How many miles do you travel from your home to your office?	4.8	17.7
How long have you been using a computer?	7.8	8.8
How many total hours each week do you use a computer (at both home and the office)?	22.7	11.2

confounding and it is very difficult to interpret specific meaning. It might be that the non-users chose to not participate in the study because of the large numbers of hours each week spent on using the computer. They may be too skilled in computer use to be attracted by the C-CAP program. Or, it may be that they use computers a considerable amount in conjunction with their regular office work and are not interested in using the computer for an additional task such as computer self-assessment. This area would have to be examined in closer perspective to begin to answer this question.

Summary of Demographic Information

The majority of the respondents worked for MSU-E for over six years, they used a computer at home for word processing purposes, all of them were assigned their own computer at the office, almost one hundred percent of them used a computer at the office for a combination of word processing purposes, database, E-mail, and educational/learning purposes. The majority of field staff used a computer more than five hours per week.

Usage of C-CAP

The second general area reflected in the research questions was how Extension field staff used C-CAP. The following questions were concerned with describing and assessing the Core Competency Assessment Program (C-CAP) by Extension field staff. The following two research questions guided the research:

1. In what ways was C-CAP used?
2. What are the strengths and weaknesses of C-CAP as seen by its users?

In the following section, the findings of the Extension field staff 's usage of C-CAP were presented. Throughout the questionnaire, there were a number of items which provided details about the Extension field staff's usage of C-CAP.

Times using C-CAP during C-CAP field test

The respondents were asked how many times during the field testing period they used C-CAP. Their responses are shown in Table 4.13.

Table 4. 13 Approximately how many times during the field testing period did you use C-CAP?

How many times was C-CAP used?	No. of Users (%)
1 time	3 (17)
2 times	5 (28)
3 times	2 (11)
4 times	3 (17)
5 times	1 (6)
6 times	1 (6)
10 times	3 (17)

As seen in Table 4.13, 18 of the respondents responded to the question. The average number of uses of C-CAP was 4, the majority of the respondents used C-CAP for more than one core competency area.

Where C-CAP was used

The respondents were asked where they used C-CAP. Their responses are shown in Table 4.14.

As seen in Table 4.14, 61% used C-CAP at the office; 17% used C-CAP at home; and 22% used C-CAP at both the office and home.

Table 4. 14 Where did you use C-CAP?

Where was C-CAP used?	No. (%)
At Office	11 (61)
At Home	3 (17)
At Home and Office	4 (22)
Other	0 (0)
Total	18 (100)

Minutes C-CAP was used each time.

The respondents were asked approximately how many minutes, on the average, they spent each time they used C-CAP. Their responses are shown in Table 4.15.

Table 4. 15 Approximately how many minutes (on the average) did you spend each time you used C-CAP?

Minutes spent using C-CAP each time	N (%)
0 - 15 minutes	2 (11)
16 - 30 minutes	7 (39)
31 - 60 minutes	5 (28)
> 60 minutes	4 (22)
Mean	46.9 minutes
Standard Deviation	26.7 minutes

As seen in Table 4.15, the average amount of time for each usage of C-CAP was 46.9 minutes; the majority of the subjects spent at least half an hour each time they used C-CAP.

Ease of Using C-CAP the first time and the last time

The respondents were asked how easy it was to use C-CAP the first time and the last time they used it. Their responses are shown in Table 4.16.

Table 4. 16 How easy was it to use C-CAP the first time and last time that you used it?

Response Category	How easy first time? No. (%)	How easy last time? No. (%)
Very hard to use (1)	0 (0)	0 (0)
Hard to use (2)	0 (0)	0 (0)
Neutral (3)	3 (17)	2 (11)
Easy to use (4)	9 (50)	5 (28)
Very easy to use (5)	6 (33)	11 (61)
Total	18	18
Mean	4.2	4.5
Standard Deviation	0.7	0.7

As seen in Table 4.16, 17% responded neutrally to how easy it was to use the first time; 50% responded it was easy to use the first time; and 33% responded that it was very easy to use the first time. In contrast, 11% responded neutrally to how easy it was to use the last time; 28% responded it was easy to use the last time; and 61% responded that it was very easy to use the last time. The mean of the last time usage of C-CAP had greatly improved in comparison to the first time usage of C-CAP.

Using C-CAP from hard drive or floppy drive

The respondents were asked how they configured the C-CAP program for use on their computer. The concept was whether they copied it to the hard drive of their computer or used it in floppy drive. Their responses are shown in Table 4.17.

Table 4. 17 How did you configure C-CAP for use on your computer?

Response Category	No. (%)
Copied it to hard drive	14 (78)
Used it in floppy drive	3 (17)
Both	1 (6)
Total	18

As seen in Table 4.17, 78% used it on their hard drive, 17% used it from their floppy drive; and 6% used both the hard drive and the floppy drive.

Rate the importance of each feature of C-CAP.

The respondents were asked to rate the importance of each feature of C-CAP. Their responses are shown in Table 4.18.

As seen in Table 4.18, 22% responded by rating “password protection” as high with either a 4 or 5 on a 1 to 5 rating scale; 50% rated “password protection” as low with either a 1 or 2. The mean rating for “password protection” was 2.5.

Table 4. 18 Rate the importance of each feature of C-CAP

N = 18	Password Protection	Show Bar Graph	Printout Wrong Answers	Review Previous Sessions	Function Keys	Screen Color	C-CAP Response Ability	C-CAP Manual	Use C-CAP at home
Response Category	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Not very important (1)	6 (33)	2 (11)	0 (0)	1 (6)	0 (0)	1 (6)	1 (6)	2 (11)	3 (17)
Not important (2)	3 (17)	3 (17)	2 (11)	3 (17)	3 (17)	5 (28)	3 (17)	2 (11)	1 (6)
Neutral (3)	5 (28)	4 (22)	2 (11)	6 (33)	11 (61)	10 (56)	6 (33)	9 (50)	6 (33)
Important (4)	2 (11)	7 (39)	6 (33)	5 (28)	3 (17)	2 (11)	6 (33)	5 (28)	4 (22)
Very important (5)	2 (11)	2 (11)	8 (44)	3 (17)	1 (6)	0 (0)	2 (11)	0 (0)	4 (22)
Mean	2.5	3.2	4.1	3.3	3.1	2.7	3.3	2.9	3.3
Standard Deviation	1.4	1.2	1.0	1.1	0.8	0.8	1.1	0.9	1.4

Fifty percent responded by rating “show bar graph” as high with either a 4 or 5 on a 1 to 5 rating scale; 28% rated “show bar graph” as low with either a 1 or 2. The mean rating for “show bar graph” was 3.2. Seventy-seven percent responded by rating “printout wrong answers” as high with either a 4 or 5 on a 1 to 5 rating scale; 11% rated “printout wrong answers” as low with either a 1 or 2. The mean rating for “printout wrong answers” was 4.1. Forty-five percent responded by rating “review previous sessions” as high with either a 4 or 5 on a 1 to 5 rating scale; 23% rated “review previous sessions” as low with either a 1 or 2. The mean rating for “review previous sessions” was 3.3. Twenty-three percent responded by rating “function keys” as high with either a 4 or 5 on a 1 to 5 rating scale; 17% rated “function keys” as low with either a 1 or 2. The mean rating for “function keys” was 3.1. Eleven percent responded by rating “screen color” as high with either a 4 or 5 on a 1 to 5 rating scale; 34% rated “screen color” as low with either a 1 or 2. The mean rating for “screen color” was 2.7. Forty-four percent responded by rating “C-CAP response ability” as high with either a 4 or 5 on a 1 to 5 rating scale; 23% rated “C-CAP response ability” as low with either a 1 or 2. The mean rating for “C-CAP response ability” was 3.3. Twenty-eight percent responded by rating “C-CAP manual” as high with either a 4 or 5 on a 1 to 5 rating scale; 22% rated “C-CAP manual” as low with either a 1 or 2. The mean rating for “C-CAP manual” was 2.944. Forty-four percent responded by

rating “use C-CAP at home” as high with either a 4 or 5 on a 1 to 5 rating scale; 23% rated “use C-CAP at home” as low with either a 1 or 2. The mean rating for “use C-CAP at home” was 3.3.

Copy C-CAP for other person

The respondents were asked if they copied the C-CAP program for other persons to use. Their responses are shown in Table 4.19.

Table 4. 19 Did you ever make a copy of C-CAP for another person?

Response Category	No. (%)
Yes	0 (0)
No	18 (100)
Total	18 (100)

As seen in Table 4.19, none of respondents copied C-CAP for another person.

Using C-CAP with another person

The respondents were asked if they used C-CAP with another person. Only one respondent said he/she used C-CAP with his/her colleague.

Reviewing a prior session of C-CAP

The respondents were asked if they reviewed a prior session of C-CAP

when doing the C-CAP field test. Their responses are shown in Table 4.20.

Table 4. 20 Using C-CAP, did you ever review a prior session of C-CAP?

Response Category	No. (%)
Yes	8 (44)
No	10 (56)
Total	18

As seen in Table 4.20, 44% responded that they reviewed a prior session; 56% responded that they had not used the reviewing a prior session function.

Reason for reviewing a prior session of C-CAP

The respondents were asked why they reviewed a prior session of C-CAP? Their responses are shown in Table 4.20.1.

As seen in Table 4.20.1, among those who reviewed previous sessions, 25% reviewed the previous sessions in order to see how the review feature worked; 63% reviewed previous sessions in order to compare two or more prior

Table 4.20. 1 Why did you review a prior session of C-CAP?

Response Category	No. (%)
To see how the review feature worked	2 (25)
To compare two or more prior scores	5 (63)
Both	1 (12)
Total	8

scores; and 12% reviewed previous sessions for both seeing how the review feature worked and comparing two or more prior scores.

Problems using C-CAP

The respondents were asked what problems they had when using C-CAP. Three respondents said that they did not have any problems at all, and fifteen respondents described their problems while using the C-CAP program. There were two types of problems described by these respondents. One type of problem, the type that is the focus for this research, was related to various aspects of the computer program. The other type of problem, not the focus of this research, was related to aspects of the core competency content. These are separated into two categories and shown below.

The following is a list of problems regarding the C-CAP computer program, written verbatim.

No printer so could not see wrong answers or have hard copies of scores, etc. to compare for improvement (1)

Offer an option to display the questions the agent got wrong on the screen, rather than having to print them out each time - save a tree! (1)

Not able to learn from my mistakes by printing (1)

Not seeing what answers I answered wrong (1)

Not enough time to use it.

Suggest that printouts of scores, questions, etc. be automatically dated by the computer so that when the agent reviews his/her past work there is a date reference. (1)

Current system requires student to choose between print out of either scores or answers. Need to be able to allow both. (1)

Offer an option to recall correct/incorrect questions and answers on any given test, rather than just being able to recall the scores (1)

Getting it started (1)

I had difficulty determining if I had tried all 10 core competencies. The program does not register them unless you exit and re-enter (1)

Having the time not getting the wrong answers (1)

Not having the ability to go back to a previous question (1)

I think I forget the first password I used so couldn't find what I'd done previously. I also would have liked being able to go back just one or two questions rather than all the way back to #1 (1)

Password (1)

Could not use the program from my hard drive (1)

The following is a list of problems regarding the C-CAP content, not the C-CAP computer program, written verbatim.

Was and still confused as to its purpose. The program's concept of Extension work is of the old ways, does not really "fit" me (1)

Not really but I did not find the questions very relevant so I never went through all the sections (1)

The questions are very academic level and not related as much to implementation and applying research to general audience "Sometime the

reality of doing something is quite different then the written academic methods" (1)

I would like to go back and look at questions on the computer screen after I had taken the test. I don't understand questions 37-45 of your questionnaire. I didn't find anything on C-CAP that give me answers. Did I miss something? (1)

Help from other people using C-CAP

The respondents were asked if they got help from other people during the C-CAP field test. Sixteen of the respondents said they did not get help from other people. Two of the respondents said they got help from other people such as getting it started and accessing the diskette.

Knowing other people using C-CAP

The respondents were asked if they knew anyone else in Michigan State University Extension that was using C-CAP during the C-CAP field test. Thirteen of the respondents said they did not know anyone else using C-CAP. Five of them said they knew other people using C-CAP. Of those five, three of them discussed their use of C-CAP with one another.

Helping others in their use of C-CAP

The respondents were asked if they helped others use C-CAP. None of the respondents helped other people.

Rating in terms of helpfulness of C-CAP

The respondents were asked how they would rate C-CAP in terms of helpfulness. Their responses are shown in Table 4.21.

Table 4. 21 How would you rate C-CAP regarding helpfulness?

Response Category	No. (%)
1 (Not at all helpful)	3 (17)
2	3 (17)
3	5 (28)
4	4 (22)
5 (Very helpful)	3 (17)
Total	18
Mean	3.1
Standard Deviation	1.3

As seen in Table 4.21, 39% responded by rating its helpfulness as high with either a 4 or 5 on a 1 to 5 rating scale; 34% rated its helpfulness as low with either a 1 or 2. The mean rating for helpfulness was 3.1.

Rating in terms of ease of use

The respondents were asked how they would rate C-CAP in terms of ease of use. Their responses are shown in Table 4.22.

Table 4. 22 How would you rate C-CAP regarding ease of use?

Response Category	No. (%)
1 (Not at all easy to use)	0 (0)
2	1 (6)
3	5 (28)
4	6 (33)
5 (Very easy to use)	6 (33)
Total	18
Mean	3.9
Standard Deviation	0.9

As seen in Table 4.22, 66% responded by rating the ease of use as high with either a 4 or 5 on a 1 to 5 rating scale; 6% rated the ease of use as low with a 2. The mean rating for the ease of use was 3.9.

Rating in terms of being worthwhile

The respondents were asked how they would rate C-CAP in terms of worthwhileness. Their responses are shown in Table 4.23.

Table 4. 23 How would you rate C-CAP regarding being worthwhile?

Response Category	No. (%)
1 (Not at all worthwhile)	3 (17)
2	3 (17)
3	3 (17)
4	3 (17)
5 (Very worthwhile)	6 (33)
Total	18
Mean	3.3
Standard Deviation	1.5

As seen in Table 4.23, 50% responded by rating its worthwhileness as high with either a 4 or 5 on a 1 to 5 rating scale; 34% rated its helpfulness as low with either a 1 or 2. The mean rating for worthwhileness was 3.3.

Computer Operating System

The respondents were asked what kind of operating system they used during the C-CAP field test. Their responses are shown in Table 4.24.

Table 4. 24 What kind of operating system did the computer have where you mainly used C-CAP?

Response Category	No. (%)
Windows	12 (67)
DOS	6 (33)
OS/2	0 (0)
Total	18 (100)

As seen in table 4.24, 67% responded that they used Windows, and 33% used DOS.

Time of day that C-CAP was used

The respondents were asked what time(s) of the day they primarily used C-CAP. Their responses are shown in Table 4.25.

Table 4. 25 At what time(s) of the day did you primarily use C-CAP?

Response Category	No. (%)
Early Morning (6:30 am - 8:00 am)	4 (22)
Morning (8:30 am - 10:00 am)	4 (22)
Late Morning (10:00 am - 12 Noon)	5 (28)
Lunch Time (12 Noon - 1:00 pm)	1 (6)
Early Afternoon (1:00 pm - 3:00 pm)	4 (22)
Late Afternoon (3:00 pm - 5:00 pm)	6 (33)
Evening (5:00 pm - 10:00 pm)	5 (28)
Late Night (10:00 pm - 6:00 am)	2 (11)

As seen in Table 4.25, 22% responded that they used C-CAP during the Early Morning (6:30 am - 8:00 am); 22% used C-CAP during the Morning (8:00 am - 10:00 am); 28% used C-CAP in the Late Morning (10:00 am - 12 Noon); 6% used C-CAP at Lunch Time (12:00 Noon - 1:00 pm); 22% responded that they used C-CAP during at Early Afternoon (1:00 pm - 3:00 pm); 33% responded that they used C-CAP in the Late Afternoon (3:00 pm - 5:00 pm); 28% used C-CAP in the Evening (5:00 pm - 10:00 pm); and, 11% used C-CAP in the Late Night (10:00 pm - 6:00 am).

Assessing C-CAP areas

The respondents were asked how many core competency areas they accessed each time they used C-CAP. Their responses are shown in Table 4.26.

Table 4. 26 How many different core competency areas did you typically access each time you used C-CAP?

Response Category	No. (%)
One area	2 (11)
More than one area	16 (89)
Total	18 (100)

As seen in Table 4.26, 11% responded they accessed only one area, and 89% responded that they accessed more than one area. Among them, 69% accessed less than four areas, 31% accessed more than four areas, and six percent accessed more than seven areas.

Feedback provided by C-CAP

The respondents were asked to describe the ways in which C-CAP provided feedback to them. Seventeen of the respondents described the ways in which C-CAP provided feedback as follows:

Printout of score (1)

Do not really know (1)

Compares what I know/believe/value with what MSU-E state staff feel I should know/believe/value (1)

Give a "quick fix" picture of core competency status (1)

Show areas I need to improve (1)

Not enough time (1)

Very little (1)

Self evaluation (1)

What I need to know, what I want to know, what I already know and I thought I would learn more (1)

Did not really tell me anything I did not already know (1)

It did not, I did not find many of the questions relevant to what Extension staff actually do in their jobs in the fields (1)

The scores and printouts of the questions missed (1)

Scores and wrong answers (1)

I repeated some progresses based on initial results (1)

I'd like to know the answers - why was wrong (1)

Given the scores for each competency to see where I need more in-service (1)

Helped to identify areas where I was not knowledgeable (1)

Strengths of C-CAP

The respondents were asked to describe the strengths of C-CAP.

Seventeen of the 18 respondents provided comments. The 17 comments regarding the strengths of C-CAP are as follows:

Easy of use (4)

Learn organization expectations (3)

Instant feedback as to what's wrong (2)

personal/private (2)

Good evaluation tool (1)

It is self-directed (1)

Review my skills (1)

Make you step back and consider overall goals and methods (1)

I could get a print-out of questions I missed (1)

Applicability, Relevance (1)

Weaknesses of C-CAP

The respondents were asked to describe the weaknesses of C-CAP.

Sixteen of the 18 provided comments. There were two types of weaknesses described by the respondents. One type of weakness, the type that is the focus for this research, was related to various aspects of the computer program. The other type of weakness, not the focus for this research, was related to various aspects of the core competency content. These are separated into two categories and shown below.

The following is a list of 5 weaknesses identified the respondents regarding the C-CAP computer program.

Not enough feedback (1)

Some groups are too long to do in one setting (1)

I would like to be able to see a print out of all questions (1)

May intimidate non-computer users of which Extension has many (1)

Does not give users a baseline for comparison (Is 65% terrible, OK, or great?) (1)

The following is a list of weaknesses regarding the C-CAP content, not the C-CAP computer program.

I did not like some of the ambiguity in possible answers (2)

Questions were ambiguous (1)

Looks at the extension educator through an old outdated perspective (1)

We have not been taught what they are attempting to test for in any systematic approach (1)

I'm sure some of these questions had no good answers or now I deemed right (1)

I like immediate feedback, questions were ambiguous (1)

Some questions seem repetitive and ambiguous (1)

By doing this you can see that academic level wrote the process. I'd like to have seen more input from field staff (1)

Same questions need to be checked for accuracy and interpretation (1)

Improvement of C-CAP

The respondents were asked to describe how C-CAP can be improved.

Fourteen of the 18 respondents provided comments. There were two types of

improvements described by the respondents. One type of improvement, the type that is the focus for this research, was related to various aspects of the computer program. The other type of improvement, not the focus for this research, was related to aspects of the core competency content. These are separated into two categories and shown below.

The following is a list of improvements regarding the C-CAP computer program.

Provide baseline for comparison (1)

Expanded (1)

Adding sound would be nice or expanding the system into a CD-ROM program where agents can access articles on areas in which they may not be knowledgeable. Note: (the greatest problem was finding time for the system during work hours) (1)

The following is a list of improvements regarding the C-CAP contents and not the C-CAP computer program.

Fix some of the ambiguity in possible answers (1)

Providing training to staff so that the material being tested is useful and relevant - otherwise why even have such an evaluation tool (1)

Changing the assessment tool on regular basis (1)

Provide set up so other areas of expertise can plug in their questions and answers. All the areas of expertise are of need of this (1)

More appropriate questions (1)

It would help to have some rationale for some (1)

Summary of Usage of C-CAP

During the field test, the majority of the respondents did the field test alone and did the field test at their office. They thought the more they used C-CAP the easier it was and that C-CAP was a good educational program. Other comments included that there are a lot of strengths in C-CAP, that C-CAP is a good way to learn about the organization and expectations, that skills can be evaluated, as well as ease of use, privacy, portability, instant feedback, identification of areas within cores that administrators feel are important, and that it is self-directed. The weaknesses of C-CAP included that some questions were repeated, that there was ambiguity in possible answers, and that some groups took too long to do in one sitting.

Value of C-CAP

The third general area reflected in the research questions was how Extension field staff valued C-CAP. The following questions concerned the description and assessment of the value of the Core Competency Assessment Program (C-CAP) by Extension field staff. The following two research questions guided the research:

1. In what ways does C-CAP improve the competency of Extension educators?

2. In what ways can C-CAP be improved in order to help Extension educators achieve career, and therefore, personal success?

In the following section, the findings of Extension field staff's value of C-CAP are presented. Throughout the questionnaire, there were a number of items which provided detailed responses of how Extension field staff valued C-CAP. Extension field staff were asked to respond to a five point Likert type scale for each item where 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly Disagree. Their responses are shown in Table 4.27.

As seen in Table 4.27, the mean of all questions regarding the value of C-CAP is above the midpoint of the scale. Two of them are rated at 4 and above. "C-CAP is a self-directed learning tool" is ranked highest, it is equal to 4.4. "C-CAP is a user-friendly program" is ranked second, and its mean is equal to 4.0. In contrast, "It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting" is ranked the lowest. "C-CAP is more motivational than attending a class" is ranked the second lowest.

Finally, the respondents were asked to give any final comments they might

Table 4. 27 Respondents' valuing of C-CAP by items.

Category/Item	Mean Agreement	S.D.
C-CAP is a self-directed learning tool.	4.4	0.5
C-CAP is a user-friendly program.	4.0	0.6
C-CAP is helpful for professional improvement.	3.9	1.0
C-CAP is a self-directed competency development tool.	3.9	0.8
C-CAP provides a motivational way to assess my core competency strengths/weaknesses.	3.9	1.0
C-CAP helped me to understand areas in which I need to improve.	3.9	1.0
C-CAP is not a very risky way to learn.	3.8	0.9
I feel that using C-CAP is an efficient method to learn about my core competencies.	3.7	1.0
The information was presented through C-CAP at a pace that enabled me to learn.	3.6	0.8
C-CAP's competency areas are clearly defined.	3.5	0.9
C-CAP is a good example of participatory learning.	3.5	1.0
C-CAP is more motivational than reading a book.	3.5	1.0
C-CAP topics are sequenced in a logical order to enhance learning.	3.3	0.8
I learned some new ideas and concepts from C-CAP.	3.4	1.1
Since I have used C-CAP, I have a better understanding of my core competency.	3.2	1.4
Through my use of C-CAP I now know more about my specific core competency.	3.1	1.2
C-CAP is more motivational than attending a class.	3.1	1.1
It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting.	3.1	1.4

have regarding the C-CAP program. Twelve of the respondents provided comments. There were two types of final comments described by the respondents. One type of comment, the type that is the focus for this research, related to various aspects of the computer program. The other type of comment, not the focus of this research, related to various aspects of the core competency content. These are separated into two categories and shown below.

The following is a list of final comments regarding the C-CAP computer program.

I think it could be a good program, but as you can see from my usage it wasn't interesting enough for me to utilize it, maybe if I felt it was really a learning tool - I didn't get that out of it (1)

I understand this to be a beta version. No doubt the questions will be checked for reliability and validity in the final version. This is necessary (1)

This was not high on my priority list but I finally got to it and enjoyed doing it. My computer at work is not hooked to a printer - we made a copy of what I had done on hard disk and I used it on a 2nd computer at work and mine at home. Diskette copy is enclosed (1)

Good tool for core competency development. However, it will not do the job by itself (1)

Loved it. Would like to continue to use. I like the reporting time limit. I really like the confidentiality (1)

There were times I felt very frustrated not being able to discuss questions and answers with someone else. If there were some suggested study materials that might help. I was also frustrated by not being able to go back to the last question I had completed. Though I'm becoming more adept at the computer I still don't know enough and only found out what I needed to know when I went to reinstall the program. Manual need to be very specific, I don't think passwords are needed (1)

The following is a list of final comments regarding the C-CAP content, not the C-CAP computer program.

Need to take a look at the role of the Extension educator before continuing. Needs a fresh look (1)

Having a device that we can periodically use for self-assessment and/or learning at our own pace without traveling is a great idea. However, I

found many of the items to involve issues never clearly presented to staff and/or more of a personal opinion/preference rather than important, basic fact (1)

I am still not sure what I gained from the time I put into this effort (1)

Test of relevant information that Extension staff need to know in order to be competent (1)

Sorry I did not take the time needed to really appreciate the value of C-CAP. I do believe it is a tool which has value in assisting staff in gaining a better understanding of core competencies (1)

Concept is good! (1)

I'd like to see answers given so you can use it more as a learning tool. Also the need to realize the counties have a variety of resources. In actuality we could have 83 different counties with all different resources. I found that the questions in applying and wording with program participants related more to a higher academic - social economic background (1)

Summary of Value of C-CAP

The majority of the respondents thought that C-CAP was a self-directed and user-friendly learning tool, and not a very risky way to learn. Other comments included that C-CAP was helpful for professional improvement, that it helped field staff to understand areas in which they needed to improve, that C-CAP also provided a motivational way to assess core competency strengths/weaknesses, and moreover, the majority of the respondents thought they learned some new ideas and concepts from C-CAP and that C-CAP was a good example of participatory learning.

Findings of Diskette Data

Based on the study, Core Competencies for Extension Service

Professionals: Selected Resource Materials for the MSU-E Core Competency

Development Team (Levine et. al. 1994), the contents of the C-CAP program

included the following ten areas of competency:

1. Professional and Career Development
2. Educational and Informational Technology
3. Written and Spoken Communication and Skills
4. Program Planning and Development
5. Program Implementation
6. Applied Research and Evaluation
7. Organizational Knowledge, Leadership and Management
8. Diversity and Pluralism
9. Marketing and Public Relations
10. Audience Identification and Development

Each area of competency included 11 to 49 questions, and 2 to 5 answers related to each question. The respondents could select each individual area, then C-CAP guided the respondents to either complete the questions according to their own pace, to terminate the program, to access more than one area.

There were a total of 14 respondents who returned the diskettes. The number of uses of C-CAP and the number of users of each C-CAP program area were analyzed, and responses are shown in Table 4.28.

As seen in table 4.28, the minimum number of uses for a C-CAP program area was 15 times in area 10 - Audience Identification and Development, and the maximum number of uses for a C-CAP program area was 31 times which was area 3 - Written and Spoken Communication and Skills. The average usage of C-CAP was 4 times. The total usage time for all areas was 210.

Table 4. 28 Statistics of collecting diskette data

C-CAP Area	No. of Uses	No. of Users per Area	Uses per User
Area 1 - Professional and Career Development	22	14	1.6
Area 2 - Educational and Informational Technology	25	14	1.8
Area 3 - Written and Spoken Communication and Skills	31	11	2.9
Area 4 - Program Planning and Development	20	12	1.7
Area 5 - Program Implementation	22	12	1.8
Area 6 - Applied Research and Evaluation	20	11	1.8
Area 7 - Organizational Knowledge, Leadership and Management	18	10	1.8
Area 8 - Diversity and Pluralism	20	12	1.7
Area 9 - Marketing and Public Relations	17	12	1.4
Area 10 - Audience Identification and Development	15	10	1.5

There were a total of 14 respondents who returned the diskettes whose responses are shown in Table 4.29.

As seen in Table 4.29, the majority of the respondents accessed more than three core competency areas. Only one respondent accessed only one area, and one respondent accessed two areas.

Relationship Between the Use, Value of C-CAP and Demographic Variables

The relationship between how long a person had been using a computer, the ease with which C-CAP was used, and the relationship between how many hours of use per week and ease of use of C-CAP was analyzed. The results are shown in Tables 4.30 and 4.31.

Table 4. 29 Number of users for competency areas

Number of Categories	Number of Unique Users
Used C-CAP in all 10 areas	3
Used C-CAP in 9 of 10 areas	1
Used C-CAP in 8 of 10 areas	1
Used C-CAP in 7 of 10 areas	1
Used C-CAP in 6 of 10 areas	1
Used C-CAP in 5 of 10 areas	1
Used C-CAP in 4 of 10 areas	2
Used C-CAP in 3 of 10 areas	2
Used C-CAP in 2 of 10 areas	1
Used C-CAP in 1 of 10 areas	1
Total	14

Table 4. 30 Relationship between how long a person has been using a computer and ease of use of C-CAP

Dependent Variable	Relationship to Years of Using a Computer
Easy the first time	0.1361
Easy the last time	0.2463

As seen in Tables 4.30, the correlation coefficients between how long a person had been using a computer and the ease of using C-CAP for the first time is 0.1361. The correlation coefficients between how long a person had been using a computer and the ease of using C-CAP for the last time is 0.2463. Both coefficients are considered to show a weak relationship.

Table 4. 31 Relationship between how many hours per week used and ease of use of C-CAP

Dependent Variable	Relationship to Hours Used per Week
Easy the first time	0.1966
Easy the last time	0.5184*

As seen in Tables 4.31, the correlation coefficients between total hours of using a computer per week and the ease of using C-CAP for the first time is 0.1966. The correlation coefficients between total hours using a computer per

week and the ease of using C-CAP for the last time is 0.5184, this coefficient is considered to be a moderately strong relationship.

A supplementary analysis was conducted to further examine the C-CAP program in relation to its value. This supplementary analysis is presented in Appendix E.

Summary

In this chapter, the findings of the pertinent data have been presented. Because the data are interrelated, for the sake of clarity, the chapter was divided into several sections. The first section examined the field staff demographic characteristics. The second section examined the MSU-E staff usage of C-CAP. The third section examined the MSU-E field staff value of C-CAP.

In the next chapter, a summary of the data will be provided, conclusions will be drawn, and an analysis, as well as recommendations, will be shared.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This study is concerned with investigating how the users of the C-CAP program use and value the program. There are four main research questions which served to focus the investigation. These research questions are:

1. In what ways is C-CAP used?
2. What are the strengths and weaknesses of C-CAP as seen by its users?
3. In what ways does C-CAP improve the competency of Extension educators?
4. In what ways can C-CAP be improved in order to help Extension educators achieve career, and therefore, personal success?

Summary of Findings

As has been presented in Chapter IV, findings have been derived for all four of the study's research questions. Regarding Research Question One, "In what ways is C-CAP used?," the study has shown the following:

The C-CAP program is used by the Michigan State University Extension staff mainly in their offices. This finding is easily understood when it is known that 100% of the respondents have access to office computers for their own use. The majority of the respondents indicated that the primary times for use of C-CAP at their offices was either in the late morning - 10:00 am until 12:00 noon, or in the late afternoon - 3:30 pm until 5:00 pm. As could be expected, the least used time for C-CAP was during the mid-day period of 12:00 noon until 1:00 pm, with the assumption being that most of the respondents would be eating lunch at that time.

The majority of the respondents used the C-CAP program by themselves without involving other people. This includes the actual use of the program for their self-assessment and also the need to gain assistance from others if they had problems with the program. In only two instances did respondents ask others for help in some aspect of getting the C-CAP program to initially operate on their computer. Additionally, when asked if they had discussed their use of the C-CAP program with other persons, the majority indicated that they had not.

This finding is supportive of the concept of self-directed learning, self-directed learning describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing

and implementing appropriate learning strategies, and evaluating learning outcomes (Knowles, 1975).

The majority of the respondents indicated that the C-CAP program was easy to use the very first time that they tried it. The major problem associated with the use of the C-CAP program was the user forgetting his/her password and not being able to review prior scores on the program due to this. The qualities of the C-CAP program that they found most important were that it was easy to use, self-directed in nature, user friendly, private, able to provide immediate feedback and it accommodated their individual learning pace.

Though the C-CAP program is designed as a non-Windows program and can be used in either a Windows or non-Windows environment, 67% of the respondents used the program within a Windows environment. No single problem was identified by a large group of the respondents regarding their use of C-CAP.

The C-CAP program consists of 10 different self-assessment areas and it was found that the majority of the C-CAP users accessed more than one of these areas during their field trial use of the program. Only two respondents used the C-CAP program in a limited manner and accessed only one of the self-assessment areas. The written and spoken communication and skill area was the most used area which was used nearly three time per user. The marketing and

public relations area was the least used area which was used less than one and half times per user. The review feature of the C-CAP program, allowing the user to review scores of prior sessions, was used by the C-CAP users.

Research Question Two focused on the strengths and weaknesses of the C-CAP program. "What are the strengths and weaknesses of C-CAP as seen by its users?" The findings associated with Research Question Two clarify that the extension educators found the C-CAP program to be private, user-friendly, and self-directed. These are all viewed as strengths of the C-CAP program.

Since the C-CAP program is designed for self-assessment it is designed with a safeguard to limit who can access the scores of the user. By using a password at the beginning of the program, the C-CAP program will only allow the viewing of prior scores by a user who knows the password of the individual whose prior scores are to be seen. This concern for privacy was seen as an important feature and a strength by the users of the program, when they were asked directly on the survey form.

However, an entirely different understanding can be drawn from the data collection diskette. On this diskette, which documents all of the times each study participant accessed/used the C-CAP program, it is apparent that a number of the respondents could not remember their password at each use of the program and continually created new user's Ids in order to gain access to the C-CAP program.

By so doing, it was impossible for these subjects to review prior uses of C-CAP. This unique situation, whereby they responded on the survey that password protection was good yet in use found it to stand in their way, is a very confounding finding of the study.

Another strength of C-CAP as seen by the users is that it is a user friendly program - reported by 83% of the users. Aspects of user friendliness included the availability of the program to be used at a time convenient to the extension educator and the ability of the program to allow the user to operate at his/her own pace. Respondents also indicated that they viewed the C-CAP program as an example of participatory learning.

An important strength of the C-CAP program in the view of the extension educators who participated in the field test was that it allowed them to be self-directed in their use of the program. The C-CAP program could be used by them without having to depend on anyone else for the assessment of their competency.

The program provided immediate feedback on their skills. This is in support of (Belasco and Trice, 1969) who suggest that learning persistence and effectiveness are enhanced if adults can obtain feedback about (1) the things they are learning, and (2) the extent and type of change in competency that results from educative activity.

In terms of weaknesses in the C-CAP program, respondents indicated two different categories of weaknesses - those weaknesses associated with the design of the program and those weaknesses associated with the content of the specific questions/answers. Since the focus of this research was on the design of the program, this discussion will only examine the weaknesses in that area. It should also be understood that the actual questions/answers included in the C-CAP program were created for the purposes of the field testing and were not designed to be the questions/answers eventually defined for full usage by the Extension staff.

There were identified by the users two main weaknesses in the C-CAP program. The first of these weaknesses was the concept of a baseline for comparison of one's scores derived by the C-CAP program. Though the design of the C-CAP program allows the user to compare his/her scores attained in successive uses of the program, there is no indication within the program of how the user compares to some normative standard. In other words, if a user achieves a score of 65%, there is no indication of how "good" or "bad" such a score is.

The second weakness identified by the users was the manner in which C-CAP provided feedback to the user regarding his/her incorrect responses. The C-CAP program provides a printout of the incorrect answers without any indication of which answer choice might be the correct one. It was felt that it might be

helpful if the correct answer was provided within the feedback mechanism. This would allow the user to know not only which items he/she got incorrect but also what the correct response to each item was.

Research Question Three focused on the ways in which the C-CAP program is able to improve the competency of Extension educators. "In what ways does C-CAP improve the competency of Extension educators?"

The findings associated with Research Question Three show that the users of the C-CAP program felt that it assisted them in understanding and learning more about their competency, helped them know areas in which they needed to improve, and that such a program as C-CAP is helpful for professional improvement.

Users of the C-CAP program during the field test felt that it was a motivational way to improve their professional competency and the majority agreed that they were able to learn new ideas and concepts through the use of the C-CAP program.

Research Question Four focused on the ways in which the C-CAP program can be improved in the future. Regarding Research Question Four, "In what ways can C-CAP be improved in order to help Extension educators achieve career, and therefore, personal success?" the study has shown the following:

The C-CAP program would be improved if, in addition to recalling the scores of previous sessions when the review feature is activated, the C-CAP program also redisplayed the correct and incorrect items. This redisplaying of the correct and incorrect items would allow a more detailed review of progress by the user.

In addition to providing feedback to the user in terms of the score and incorrect items, it was felt by the field test users that the C-CAP program would be improved if actual learning resources were identified. This listing of learning resources could assist the user in improving his/her competency. A detailed manual to assist the user was identified as another improvement that would improve the C-CAP program. Such a manual would provide clarity of the C-CAP program features and therefore provide more of a guarantee that users would make full use of the program.

The users suggested that a way to guarantee the quality of the questions used in the C-CAP program would be to regularly change/update the content. This would allow the program to be more dynamic and to more accurately reflect the practices of Extension educators. In addition, ambiguous items could be identified and removed and more appropriate questions in some areas could be brought into the program.

Limitations

It is important for the reader to understand the very severe limitations of this study and care should be taken into trying to extend these findings to other situations. These limitations are evident due to the very small sample size, the large number of non-respondents and the exploratory nature of the research. Exploratory studies of this type are important as initial steps into a new area but can not, and should not, be used to explain situations in other studies and populations.

Conclusions

The following conclusions are drawn from the findings of this study.

Conclusion 1. It is possible to develop a computer-based self-assessment program to facilitate the learning of Extension field staff.

Clearly, the C-CAP computer program was designed as a functioning self-assessment computer program that could be used by individuals to assist in their own self-assessment. However, the real question was not so much in the development of the program as it was in the issue of whether or not the field staff of Michigan State University Extension would actually use the program. Would individuals go through the steps to install the program on a computer? For many field staff who are not assigned their own computer, would they find a computer

that they could access for their use during the field testing? Would the field staff take time out of their busy schedule to actually use the program? It is these questions that the research attempted to more fully understand. If the field staff would not go through the steps to put the C-CAP computer program to use, then regardless of how good the program was as a self-assessment tool it would have limited value in actual practice.

The findings of this research clearly indicate that it is possible to develop such a program and that the program was, in fact, used by the Extension field staff. The concept of the C-CAP program was compelling enough for field staff to take the time to actually install it on a computer and the computer was most typically at their office and not at home. The flexibility and ease of use of the C-CAP program allowed the field staff to fit their use of the program into their very busy and demanding schedule. Regardless of the time of day, if the Extension field staff member had a few minutes of available time the program was available to be used.

Conclusion 2. Maintaining one's privacy while using a self-assessment computer program is not an important concern of the user.

A major design feature of the C-CAP self-assessment computer program was the inclusion of password protection that allows the user to effectively hide the results of his/her self-assessment from the view of others. The findings of

this research indicate that the inclusion of such a privacy feature was not an important concern of the users. In fact, analysis of the actual computer files returned to the researcher show that, for a number of users, the password was potentially more of an annoyance than it was a help. For this group of users the concern was not so much on privacy as it was on actually remembering the password that they had chosen. In subsequent uses of the C-CAP program these users were blocked from reading their prior scores due to their entering of unique passwords each time they used the program. In essence the C-CAP program responded to these users as if each use by them was by a different person. The privacy feature was not important enough for them to remember from use to use. However, it should be pointed out, that only selected individuals from throughout Michigan State University Extension participated in this research and in no case was there a situation where an entire county office staff were given access to the C-CAP program. It could be expected that in such situations, which would more closely resemble the actual implementation of C-CAP throughout Michigan State University Extension, where each user knew that many others were accessing the program on the same computer that the value of the privacy of a password would be increased. The motivation, therefore, to remember one's own password could be expected to be considerably stronger.

Conclusion 3. The instruction manual that accompanied the C-CAP self-assessment program was an important feature of the total self-assessment package.

Computer programs have "grown up" with a tradition that seems to clearly indicate that a manual must be included with the program but the quality of the manual is often less than acceptable. Frequently written by computer programmers, the manuals that accompany computer programs are often written in awkward language, lack consistency of presentation, and are not prepared with a clear understanding of the user needs that must be facilitated through the manual. In many cases the manual is included more as a requirement of the sale of a computer program rather than to actually facilitate the use of the program.

For this research the manual was included in two forms - as a printed publication that accompanied the disks and also as a printable file included with the other files needed for running the program. The label on the program disk included clear instructions on how to print the manual that was included as a file.

The users of the C-CAP program indicated that the manual was an important part of the total package. However, it was evident that a number of the users did not consult the manual due to the type of problems that they experienced and reported. Some users had initial difficulty in installing the program - a topic that was presented at the beginning of the manual. And, for

one user who made a number of phone calls to the researcher regarding help in using the program, each of the questions that were asked of the researcher were dealt with in the manual.

It becomes clear that the inclusion of a manual is important but it is also important to create some mechanism whereby the user actually reads the manual and is able to easily derive the needed information from the manual.

Conclusion 4. An important aspect of a self-assessment computer program is the feedback that is provided to the user.

The availability of feedback on their progress with the C-CAP computer program was a strong concern of the users. It is through the availability of timely and meaningful feedback that the learning potential of a program such as the C-CAP program can be enhanced. The inclusion of such feedback appears to be an essential element in the program and without feedback it could be expected that the importance and value of the program to the user would be greatly diminished.

Conclusion 5. The investment in the development and dissemination of a self-assessment computer program for Extension field staff is a good choice.

The actual cost of the development of the C-CAP computer program was not very large. In fact, since the researcher was going to use the program as the basis for this research, much of the time needed for program development was done by the researcher on his own and not charged to Michigan State University

Extension. The other tangible costs associated with the C-CAP program, computer disks and printing, were minimal in nature and did not incur much expense.

The reported value of the C-CAP program, as perceived by the users, far outweighs the very small investment made to prepare the program. Certainly it will be difficult to maintain such an equitable cost situation in the future, but computer programs as a vehicle for self-assessment should not be avoided without first identifying real costs associated with the development. And, through the inclusion of students as a major aspect of such development it is possible to keep costs extremely low.

Conclusion 6. A concern has emerged from this research regarding whether or not Extension field staff will really use a device like C-CAP when it is made available to them. Though this research has looked primarily at the strengths and weaknesses of the C-CAP program it should not be assumed that the program will actually be used regardless of the strengths of it. In particular this research indicates that it was difficult getting a large percentage of those who volunteered to participate in the research to actually use C-CAP and complete the post-use survey. It may be necessary to accompany the general dissemination of C-CAP with an extensive promotional program to attempt to entice field staff to actually use the program.

Conclusion 7. It is difficult for the respondent in survey research of this nature to differentiate between providing feedback on the medium of the self-assessment rather than the content of the self-assessment.

Many of the respondents continually went beyond the computer program focus of the research and the questions asked on the survey instrument and provided comments and regarding the content that was included in the C-CAP program. Though not solicited from the users, concerns were raised regarding the validity of questions, the comprehensiveness of questions and the potential alternative answers to questions. Since the C-CAP program that was used for the research was a preliminary version and the included questions were only tentative in nature, the survey instrument only focused on the workings of the computer program itself and not the content of the program. Through this research it has become clear that such a division between the medium of the self-assessment and the content of the self-assessment is an artificial one and not consistent with the expectations of the users. In fact, it becomes apparent through this research that the medium of the self-assessment and the content should not be separated but, in fact, should both be examined through the research. This would be consistent with the reality of the users of the program who do not differentiate between the medium and the content.

Recommendations

The following recommendations are made as a result of this research.

Recommendation 1. It is recommended that the manual for the C-CAP program be reexamined and rewritten with the views of the user clearly in mind. The information that is presented in the manual must respond to the problems that were identified in this research. In addition, it would seem most appropriate if a committee of Extension field staff cooperated in the development of the revised manual so that it might best fit their learning styles.

Recommendation 2. It is recommended that computer programs such as C-CAP can become a viable development focus for university-based organizations such as Extension if the organizations are able to effectively capitalize on the involvement of students in the development efforts. The potential for including students in the development of such programs is a major cost saving factor that makes such development extremely reasonable. In addition the opportunity for the students to gain direct experience in the development of software is in direct support of their academic pursuit.

Recommendation 3. It is recommended that in further research of this nature that the examination of a computer program be conducted with a parallel

concern for the content of the program. The two concerns, the medium and the content, should not be assumed to be separate and non-interacting functions.

Recommendation 4. It is recommended that when conducting research of this nature that the researcher carefully examine the potential of the research throughout the beginning stages and to periodically decide whether to proceed as planned, or to make changes in the plan. For instance, it might have been most appropriate in this research study to have stopped the study at an early stage in order to define a larger population base from which to draw a large sample.

Recommendation 5. It is recommended that steps be taken in the redesign of the C-CAP program to compensate for the inability of some subjects to remember their password. This might be best accommodated by structuring the selection of the password (“what is your birthday? what is the color of your car?”, etc.) rather than the unstructured procedure of selecting any password that was used with C-CAP.

Recommendation 6. It is recommended that other areas of Extension practice that can benefit from self-assessment and reflection be identified and examined for potential implementation through a computer self-assessment procedure.

Recommendation 7. It is recommended that future research of this nature focus more on a qualitative approach to build a stronger foundational view.

Through a qualitative approach it would be possible to collect richer data that would inform the researcher from the perspective of the subject which is essential in exploratory studies of this nature using a telephone survey technique or in-person interviews would seem to be approaches that would hold merit for research of this nature.

APPENDICES

APPENDIX A

APPENDIX A
LETTERS AND CONSENT FORM

January 10, 1995

Guilin Cui
1441 D Spartan Village
East Lansing, MI 48823

[Extension Agents First and Last Name
Street Address
City, State and Zip]

Dear [Extension Agents First Name];

I'd like to ask your assistance in participating in the field testing of the MSU-E Core Competency Assessment Program (C-CAP) computer program which will be the focus of my doctoral dissertation research. As you may be aware, I have been working with Dr. Joe Levine for the past several months in the development of a computer program that is designed to be used by MSU Extension staff to self-assess their core competency. The program has been through a series of revisions and is now at a point where we need to have some feedback from MSU-E staff on the program - its use and its value. If you would like to participate in this field testing of C-CAP, here is what will be expected of you:

- a) Use the C-CAP computer program.
The latest version of C-CAP will be sent to you for your use and exploration. You can use it at home, at the office, with colleagues, or wherever you'd like.

b) Complete and return a questionnaire.

The questionnaire will be sent out approximately 10 weeks after you initially receive C-CAP. The questionnaire will include questions regarding your use of C-CAP and your perceptions of the value of C-CAP.

c) Copy some of the C-CAP files for returning to us for analysis.

This will provide further information regarding how often you used C-CAP, the specific subtests that you used, items that appear confusing, etc.

If you agree to participate in this field testing, your identity will be kept confidential and you will not be asked at any time to reveal your name on either the questionnaire or the returned data files. Further, the identities of those participating in the field testing will only be known to me and not disclosed to any other person. All records that show names of participants in this research will be destroyed as soon as the data collection has been completed. The clear intention of this research is to examine the use and value of the C-CAP computer program to provide the basis for further improvement of it and not to evaluate the competency of Extension staff.

I am in the process of identifying 30 members of MSU-E to participate in this research and I hope you will agree to be one of them and try the new C-CAP program. I think you will find the experience interesting and not at all intrusive in your busy schedule. In fact, you can easily adjust your tryout of C-CAP to whatever constraints you have.

Would you please fill out the enclosed consent form to let me know whether or not you would like to participate.

Thank you for considering this request.

Sincerely,

Guilin Cui
Doctoral Candidate

Field Test of the C-CAP Computer Program**CONSENT FORM**

Please complete the appropriate section of this form and return in the enclosed stamped envelope as soon as possible.

____ No, I do not want to participate in the field testing of C-CAP.

I understand that I am in no way obliged in any way to participate in this research and my refusal to participate will be known only to the researcher and not reported to any other person.

Name _____

____ Yes, I would like to participate in the field testing of C-CAP.

I understand that I will be receiving a computer diskette with the C-CAP program on it, that I will be expected to use it in my own way for approximately 10 weeks, and that after that time I will be expected to complete a questionnaire to assess my reactions to the use and value of C-CAP. In addition I will be expected to copy some of the C-CAP files for returning with the questionnaire.

I further understand that my name/identify will in no way be used throughout this research and that all my responses will be made anonymously, that data will be reported in aggregated ways and no attempt will be made to identify me by name. In addition, the recording of my participation in this research along with the names of all participants in the research will be destroyed once the data collected phase has been completed.

Name _____

Signature _____

Mailing Address _____

Date _____

Return this form to:

Guilin Cui
Agricultural & Extension Education
410 Agriculture Hall
East Lansing, MI 48824-1039

April 19, 1995

Guilin Cui
1441 D Spartan Village
East Lansing, MI 48823

[Extension Agents First and Last Name
Street Address
City, State and Zip]

Dear [Extension Agents First Name];

Thank you for your participating in Core Competency Assessment Program (C-CAP) field test, there is ten weeks since the C-CAP was shipped out.

Enclosed are a C-CAP data collecting diskette and survey questionnaire to access your reactions to the use and value of C-CAP.

I hereby declare that your name/identity will in no way be used throughout this research and that all of your response will be made anonymously.

If you have any technical problems for extracting the C-CAP data, please feel free to contact me. My Email address is cui@msuces.canr.msu.edu.

When you extract the C-CAP data, only thing you need to do is type
a:\extract.exe or b:\extract.exe on DOS prompt.

Sincerely,

Guilin Cui
Doctoral Candidate

May 26, 1995

Guilin Cui
1441 D Spartan Village
East Lansing, MI 48823

[Extension Agents First and Last Name
Street Address
City, State and Zip]

Dear [Extension Agents First Name];

Three weeks ago I sent to you a questionnaire regarding the pilot testing of the C-CAP computer program. As of this time I have not yet received your questionnaire and was hoping that it might soon be on the way to me. I know how busy this time of year is for Extension staff and hope that it will be possible for you to find a few minutes to complete the questionnaire. In the event that you might have misplaced the original questionnaire and diskette, I am including in this envelope a second copy for your use. Please read over the original cover letter that is attached - it clarifies exactly what information I need from you.

Please let me know if you have any questions or concerns that I may be able to answer. I certainly appreciate your willingness to have tried C-CAP and look forward to your reactions on the questionnaire.

Sincerely,

Guilin Cui
Doctoral Candidate

June 20, 1995

Guilin Cui
1441 D Spartan Village
East Lansing, MI 48823

[Extension Agents First and Last Name
Street Address
City, State and Zip]

Dear [Extension Agents First Name];

Two month ago I sent to you a questionnaire regarding your participation in the field testing of the C-CAP computer program. Two weeks ago I sent a follow-up note and included another copy of the questionnaire. As of this date I have yet to receive your completed questionnaire.

If you have not received the questionnaires that I have sent, would you please contact me at your convenience and I can send another copy. If you have any questions about your participation in the study I would be happy to answer them.

As you know, the data from this study will be used to improve the C-CAP computer program. I am hoping that it will be possible to include your reactions to C-CAP in the results/recommendations.

Sincerely,

Guilin Cui
Doctoral Candidate

August 25, 1995

Forth Request

Guilin Cui
1441 D Spartan Village
East Lansing, MI 48823

[Extension Agents First and Last Name
Street Address
City, State and Zip]

Dear [Extension Agents First Name];

This will be the last time that I write to ask for your cooperation in providing me with your reactions to the C-CAP program. Once again I am enclosing a copy of the questionnaire, a diskette for copy some of your C-CAP files and a return envelope. I hope I will be able to include your information in the final write-up for this project.

As you know, this research is a part of my doctoral degree requirements and the final report will also be used by MSS-E to assist in the refinement and continued development of C-CAP. I would really appreciate receiving your completed questionnaire.

If for any reason you are not able to complete this question would you please get in touch with me.

Sincerely,

Guilin Cui
Doctoral Candidate

encl.: Copy of original consent form

September 25, 1995

Final Request

Guilin Cui
1441 D Spartan Village
East Lansing, MI 48823

[Extension Agents First and Last Name
Street Address
City, State and Zip]

Dear [Extension Agents First Name];

Help! I am trying to collect as much information as I can on the C-CAP program and I hope that I can include your information. Please take just a few minutes to complete the enclosed questionnaire.

Sincerely,

Guilin Cui
Doctoral Candidate

APPENDIX B

APPENDIX B

INSTRUMENT

Core Competency Assessment Program (C-CAP) Field Test User Survey

This survey instrument has been designed to assess C-CAP user reactions to the preliminary field testing of the C-CAP computer program

Background Information

1. What is your current job title?

2. What is your program area(s)?

3. How many years have you worked for MSU Extension? _____ years

4. What percentage of your assignment with MSUE is actually spent in providing educational services to clientele (rather than supervising, administering, etc.)?

_____ % of time providing educational services

5. How many miles do you travel from your home to your office? _____ miles

6. How long have you been using a computer? _____ years

7. Do you use a computer at home? __ YES __ NO (If NO, go to question #8)

7a. If YES, for what purposes do you use it? (check all that apply)

- ☐ Word processing
- ☐ Spreadsheets
- ☐ Database use
- ☐ Games/Recreational uses
- ☐ Electronic mail (E-Mail)
- ☐ Accessing information sources
- ☐ Educational/Learning uses
- ☐ Connecting with bulletin boards
- ☐ Other (please specify _____)

8. Are you assigned your own computer at your office?

- ☐ YES (If YES, go to question #9)
- ☐ NO (If NO, go to question #8a)

8a. If NO, is there a computer at your office that you are able to use?

- ☐ YES ☐ NO (If NO, go to question #10)

If YES, what is the position/title of the person whose computer you usually use?

9. For what purposes do you use a computer at your office? (check all that apply)

- ☐ Word processing
- ☐ Spreadsheets
- ☐ Database use
- ☐ Games/Recreational uses
- ☐ Electronic mail (E-Mail)
- ☐ Accessing information sources
- ☐ Educational/Learning uses
- ☐ Connecting with bulletin boards
- ☐ Other (please specify _____)

10. How many total hours each week do you use a computer (at both home and the office)?

_____ hours

C-CAP USAGE INFORMATION

This section of the survey asks about how you used C-CAP during the field testing period.

11. Did you actually use the C-CAP computer program that was provided to you?

____ YES ____ NO

(If NO, please disregard remaining survey items - return questionnaire in stamped envelope)

12. Approximately how many times during the field testing period did you use C-CAP?

____ times

13. Where did you use C-CAP?

____ at home

____ at office

____ at home and office

____ other (please specify) _____

14. Approximately how many minutes (on the average) did you spend each time you used C-CAP?

____ minutes/each time used

15. Please rate how easy it was to use C-CAP the first time that you used it (circle appropriate number).

Very hard
to use the
first time

1

2

3

4

5

Very easy
to use the
first time

16. Please rate how easy it was to use C-CAP the last time that you used it (circle appropriate number).

Very hard to use the last time	1	2	3	4	5	Very easy to use at last time
--------------------------------------	---	---	---	---	---	-------------------------------------

17. How did you configure C-CAP for use on your computer?

___ copied it to my hard drive

___ used it in my floppy drive

18. Rate the importance to you of each of the following C-CAP features:

	Not very important				Very important
My scores protected by a password	1	2	3	4	5
Presentation of my scores on a bar graph	1	2	3	4	5
Printout of my wrong answers	1	2	3	4	5
Able to review my previous sessions	1	2	3	4	5
The availability of F(function) keys	1	2	3	4	5
Color of the screen	1	2	3	4	5
Capability of program to wait for me	1	2	3	4	5
The C-CAP manual	1	2	3	4	5
Able to use program at home	1	2	3	4	5

19. Did you ever make a copy of C-CAP for another person?

☐ YES (times)

☐ NO

20. Did you ever use C-CAP with another person?

☐ NO (I always used it alone)

☐ YES (I used it with others)

If YES (you used C-CAP with another person):

How many other people?

Who were they? (colleagues? family? friends? etc.)

21. When using C-CAP, did you ever review a prior session of C-CAP?

☐ YES ☐ NO

If yes, why?

☐ to see how the review feature worked

☐ to compare two or more prior scores

☐ other _____

22. What problems did you have in using C-CAP?

23. Did you get help from other people in using C-CAP?

☐ YES ☐ NO

If YES, what kind of help?

24. Did you know anyone else in MSUE that was also using C-CAP during this field test?

___ YES ___ NO

If YES did you discuss C-CAP with them? ___ YES ___ NO

25. Did you help others in their use of C-CAP during this field test period?

___ YES ___ NO

If YES, what kind of help?

26. If you were to talk about C-CAP to others in MSUE, how would you rate it?

	Not at All				Very
In terms of helpfulness?	1	2	3	4	5
In terms of ease of use?	1	2	3	4	5
In terms of being worthwhile?	1	2	3	4	5

27. What kind of operating system did the computer have where you mainly used C-CAP?

___ Windows
 ___ DOS (Non windows)
 ___ OS/2

28. At what time(s) of the day did you primarily use C-CAP? (check all that apply)

___ Early Morning (6:30 am - 8:00 am)
 ___ Morning (8:00 am - 10:00 am)
 ___ Late Morning (10:00 am - 12 Noon)
 ___ Lunch Time (12 Noon - 1:00 pm)
 ___ Early Afternoon (1:00 pm - 3:00 pm)

- ☐ Late Afternoon (3:00 pm - 5:00 pm)
☐ Evening (5:00 pm - 10:00 pm)
☐ Late Night (10:00 pm - 6:30 am)

29. How many different core competency areas did you typically assess each time you used C-CAP?

- ☐ only one core area each time I used C-CAP
☐ more than one core area each time I used C-CAP (how many?)

30. Describe the ways in which the C-CAP program provided feedback to you?

31. What are the strengths of C-CAP?

32. What are the weaknesses of C-CAP?

33. How can C-CAP be improved?

C-CAP's VALUE TO YOU

This section of the survey asks about the value that you feel C-CAP has for you. Please circle the answer which best indicates your degree of agreement with each statement.

KEY.

1 = I strongly disagree with this statement

2 = I disagree with this statement

3 = Neutral

4 = I agree with this statement

5 = I strongly agree with this statement

34. C-CAP helped me to understand areas in which I need to improve.

1 2 3 4 5

35. C-CAP provides a motivational way to assess my core competency strengths/weaknesses.

1 2 3 4 5

36. It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting.

1 2 3 4 5

37. I feel that using C-CAP is an efficient method to learn about my core competencies.

1 2 3 4 5

38. Through my use of C-CAP I now know more about my specific core competency.

1 2 3 4 5

39. Since I have used C-CAP, I have a better understanding of my core competency.

1 2 3 4 5

40. I learned some new ideas and concepts from C-CAP.

1 2 3 4 5

41. C-CAP is more motivational than reading a book.

1 2 3 4 5

42. C-CAP is more motivational than attending a class.

1 2 3 4 5

43. C-CAP is a self-directed learning tool.

1 2 3 4 5

44. C-CAP is helpful for professional improvement.

1 2 3 4 5

45. C-CAP is a self-directed competency development tool.

1 2 3 4 5

46. C-CAP is a user-friendly program.

1 2 3 4 5

47. C-CAP is not a very risky way to learn.

1 2 3 4 5

48. C-CAP's competency areas are clearly defined.

1 2 3 4 5

49. The information was presented through C-CAP at a pace that enabled me to learn.

1 2 3 4 5

50. C-CAP is a good example of participatory learning.

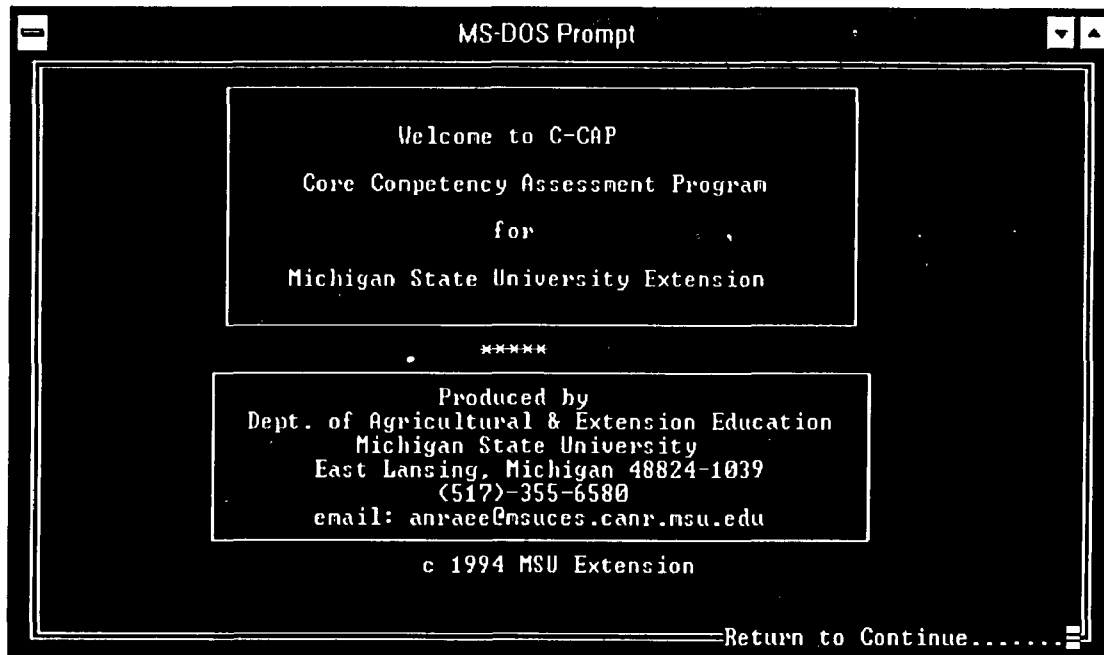
1 2 3 4 5

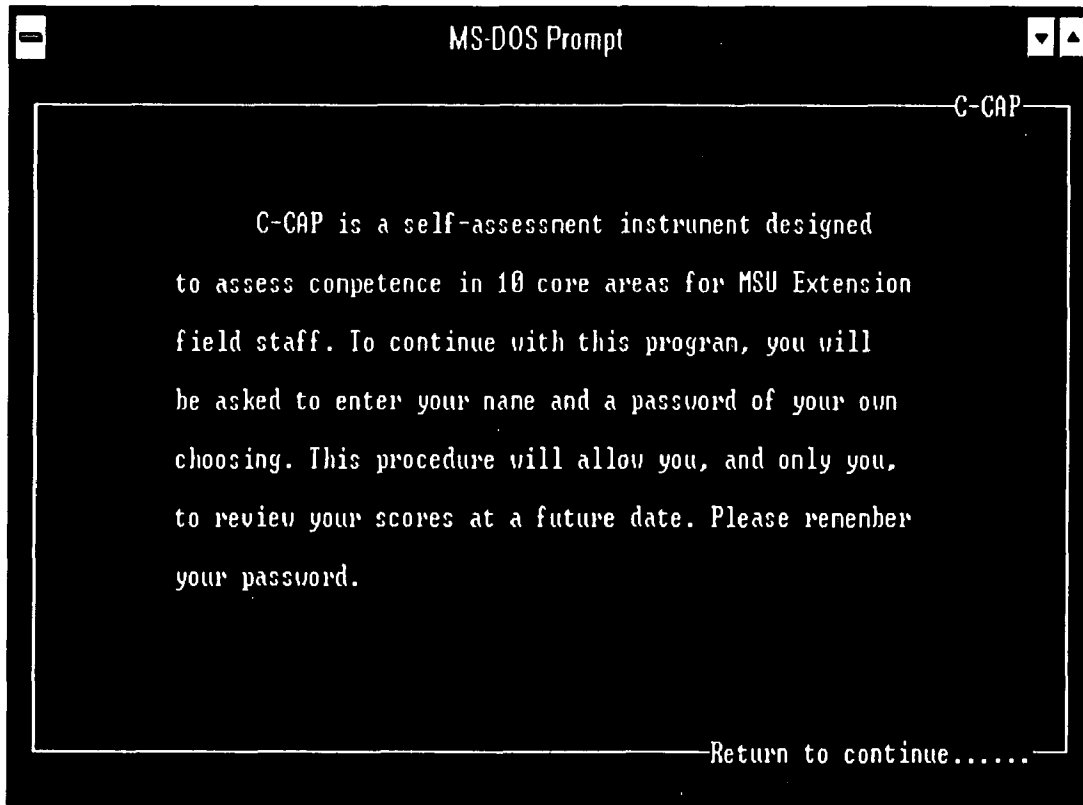
51. C-CAP topics are sequenced in a logical order to enhance learning.

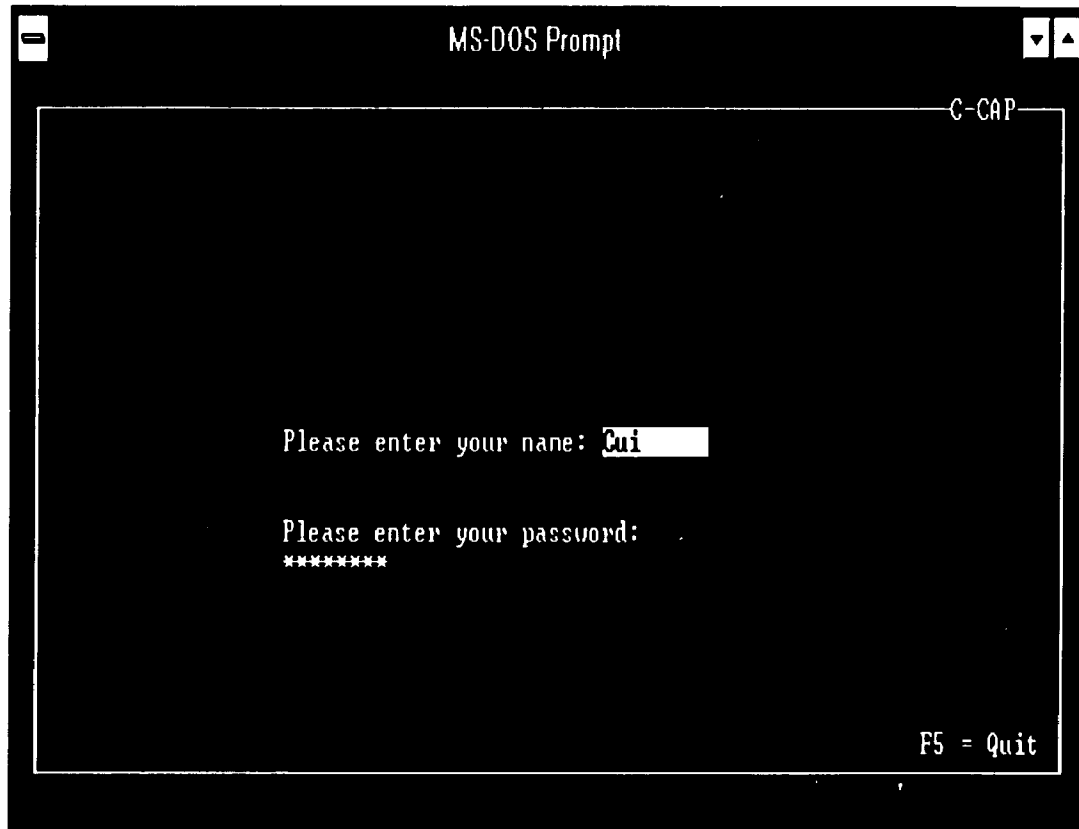
1 2 3 4 5

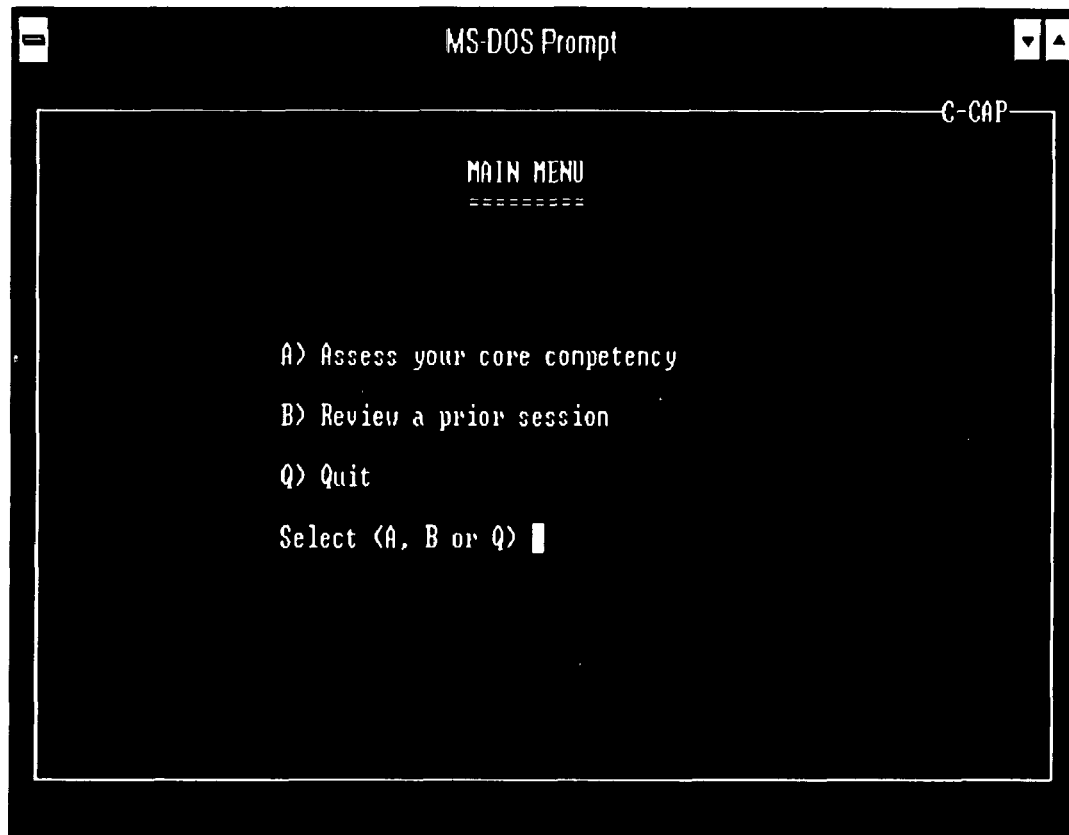
APPENDIX C

APPENDIX C
SAMPLE SCREENS FROM C-CAP









MS-DOS Prompt

C-CAP

Which CORE COMPETENCY AREA would you like to work on?

- 1). Professional and Career Development (14 Questions)
- 2). Educational and Information Technology (11 Questions)
- 3). Written and Spoken Communication and Skills (31 Questions)
- 4). Program Planning and Development (20 Questions)
- 5). Program Implementation (16 Questions)
- 6). Applied Research and Evaluation (44 Questions)
- 7). Organizational Knowledge, Leadership & Management (49 Questions)
- 8). Diversity and Pluralism (11 Questions)
- 9). Marketing and Public Relations (16 Questions)
- 0). Audience Identification and Development (16 Questions)

Select (1-0) █

Select M to return to Main Menu F1 = Help

MS-DOS Prompt

C-CAP

Professional and Career Development

Question 1 of 14

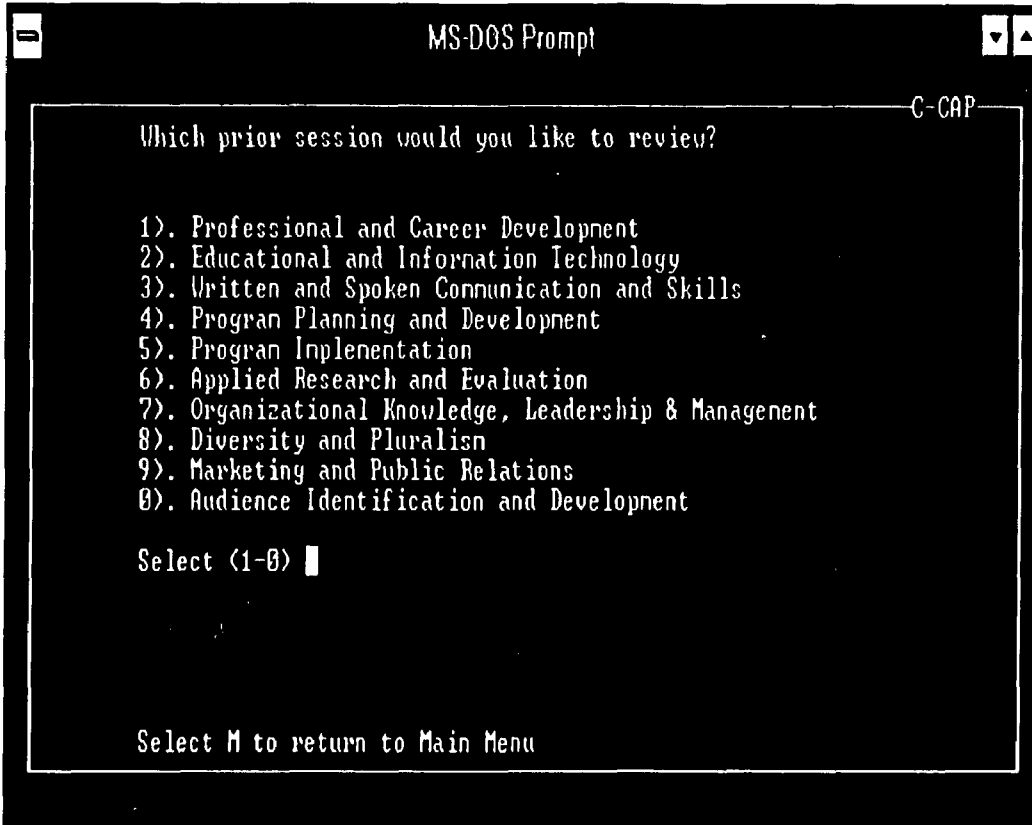
An essential role of an extension educator is:

Answers:

- A Lecturer
- B Learning needs assessor
- C Marketer
- D Convener

Choice:

F1 = Help
F2 = Return to 1st question in this CORE COMPETENCY AREA
F3 = Restart program from Main Menu
F4 = Quit and save a record of what I completed
F5 = Quit but do not save this record



APPENDIX D

APPENDIX D
INCORRECT QUESTIONS/ANSWERS

Professional and Career Development
Early Career Stage
Incorrect Questions/Answers

1

An essential role of an Extension educator is:

- A Lecturer
- B Learning needs assessor
- C Marketer
- D Convener

5

During the past few years I have had an opportunity to participate as a mentor for a newer staff member.

- A Yes
- B No

This area included 14 questions
Early Career Stage
Score = 85.71

**Professional and Career Development
Introductory Career Stage
Incorrect Questions/Answers**

1

An essential role of an Extension educator is:

- A Lecturer**
- B Learning needs assessor**
- C Marketer**
- D Convener**

This area included 14 questions

Introductory Career Stage

Score = 92.85

Educational and Information Technology
Continuing Career Stage
Incorrect Questions/Answers

1

CEENet is an acronym for:

- A Communication and Extension Evaluation Network
- B Cooperative Extension Education Network
- C Communication and E-mail Extension Network
- D Cooperative Extension E-mail Network

This area included 11 questions

Continuing Career Stage

Score = 90.90

Professional and Career Development

This area included 14 questions

Introductory Career Stage

Score = 92.85

Early Career Stage

Score = 92.85

Continuing Career Stage

Score = 85.71

APPENDIX E

APPENDIX E

SUPPLEMENTARY ANALYSIS

The T-test was used to analyze the value of the C-CAP program. To do the T-test, the respondents were grouped into 3 categories based on years worked for MSU-E. Each group consisted of 6 respondents. The lowest and highest groups were used for the T-tests. One group included the six respondents who had worked for Extension the shortest period of time. The mean amount of year that this group worked for Extension was 2.4. The other group consisted of the six respondents who had worked for Extension the longest period of time. The mean amount of year that this group worked for Extension was 18.3. These data are shown in Table E.1.

As seen in Table E.1, the lowest and highest group scores of respondents who had been working for MSU-E showed a significant difference regarding the question, “I feel that using C-CAP is an efficient method to learn about my core competencies”. In other words, the group who had worked for Extension the shortest period of time thought that C-CAP was an efficient method to learn about his/her core competencies. The other group, who had worked for Extension

the longest period of time, thought C-CAP was not an efficient method to learn about one's core competencies. None of the other values of C-CAP accounted for differences between the groups.

Table E. 1 Value of C-CAP relative to length of MSU-E service

Dependent Variable	GROUP		T Values
	Mean scores for the shortest length of services (n=6)	Mean scores for the longest length of services (n=6)	
C-CAP helped me to understand areas in which I need to improve.	3.8	3.8	1.000
C-CAP provides a motivational way to assess my core competency strengths/weaknesses.	4.2	3.7	0.451
It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting.	3.0	2.8	0.828
I feel that using C-CAP is an efficient method to learn about my core competencies.	4.2	3.2	0.044*
Through my use of C-CAP I now know more about my specific core competency.	3.3	3.2	0.813
Since I have used C-CAP, I have a better understanding of my core competency.	3.5	3.2	0.679
I learned some new ideas and concepts from C-CAP.	3.2	3.5	0.614
C-CAP is more motivational than reading a book.	4.0	3.3	0.260
C-CAP is more motivational than attending a class.	2.5	3.3	0.231
C-CAP is a self-directed learning tool.	4.5	4.2	0.260
C-CAP is helpful for professional improvement.	3.8	4.2	0.363
C-CAP is a self-directed competency development tool.	4.0	3.8	0.734
C-CAP is a user-friendly program.	4.2	3.8	0.363
C-CAP is not a very risky way to learn.	3.3	4.0	0.260
C-CAP's competency areas are clearly defined.	3.5	3.7	0.787
The information was presented through C-CAP at a pace that enabled me to learn.	3.8	3.3	0.296
C-CAP is a good example of participatory learning.	3.2	3.8	0.267
C-CAP topics are sequenced in a logical order to enhance learning.	3.2	3.3	0.780

* $P \leq 0.05$

The respondents were grouped into 3 categories based on percentage of assignment spent in providing educational service. Each group consisted of 6 respondents. The groups including the least and most amount of time providing educational service were used for the T-tests. One group consisted of the six respondents who spent the least percentage of their assignment time in providing educational services. The mean amount of time that this group spent providing educational service was 36.7%. The other group included the six respondents who spent the greatest percentage of their assignment time in providing educational services. The mean amount of time that this group spent providing educational service was 89.2%. These data are shown in Table E.2.

As seen in Table E.2, the lowest and highest group scores of respondents whose percentage of assignment time was spent in providing educational services has a significant difference regarding the following questions:

“C-CAP is a user-friendly program.”

“C-CAP is a good example of participatory learning.”

“C-CAP topics are sequenced in a logical order to enhance learning.”

The group that had the least percentage of assignment time spent in providing educational services thought that C-CAP was a user-friendly program, that C-CAP was a good example of participatory learning, and that C-CAP topics were sequenced in a logical order to enhance learning, significantly more so than

the group that had the highest percentage of assignment time spent in providing educational services.

Table E. 2 Differences in valuing based on amount of time spent providing educational services

Dependent Variable	GROUP		T Values
	Mean scores for the least amount of on-job time as educator (n=6)	Mean scores for the most amount of on-job time as educator (n=6)	
C-CAP helped me to understand areas in which I need to improve.	4.3	4.3	1.000
C-CAP provides a motivational way to assess my core competency strengths/weaknesses.	4.3	4.3	1.000
It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting.	3.3	2.8	0.574
I feel that using C-CAP is an efficient method to learn about my core competencies.	4.0	3.7	0.563
Through my use of C-CAP I now know more about my specific core competency.	3.8	3.2	0.310
Since I have used C-CAP, I have a better understanding of my core competency.	4.2	3.3	0.220
I learned some new ideas and concepts from C-CAP.	4.0	3.5	0.341
C-CAP is more motivational than reading a book.	3.3	3.7	0.619
C-CAP is more motivational than attending a class.	3.2	3.3	0.813
C-CAP is a self-directed learning tool.	4.5	4.3	0.599
C-CAP is helpful for professional improvement.	4.3	4.2	0.664
C-CAP is a self-directed competency development tool.	4.3	3.7	0.188
C-CAP is a user-friendly program.	4.3	3.7	0.049*
C-CAP is not a very risky way to learn.	3.5	3.8	0.614
C-CAP's competency areas are clearly defined.	4.0	3.3	0.207
The information was presented through C-CAP at a pace that enabled me to learn.	4.0	3.5	0.270
C-CAP is a good example of participatory learning.	4.3	3.0	0.010*
C-CAP topics are sequenced in a logical order to enhance learning.	4.2	3.0	0.016*

* $P \leq 0.05$

The respondents were grouped into three categories based on the number of years of computer usage. Each group consisted of six respondents. The lowest and highest groups were used for the T-tests. One group included the six respondents who had used a computer the shortest period of time. The mean amount of year that this group used a computer was 4.3. The other group consisted of the six respondents who had used a computer the longest period of time. The mean amount of year that this group used a computer was 12.8. These data are shown in Table E.3.

As seen in Table E.3, there was a significant difference regarding the question, “C-CAP helped me to understand areas in which I need to improve” between those who had been using computers the shortest period of time and those using computers the longest period of time.

The respondents were grouped into three categories based on the number of times the C-CAP program was used during the C-CAP field testing period. Each group consisted of six respondents, the fewest number of usage group and greatest number of usage group were used for the T-tests. One group included the six respondents who had used C-CAP program the fewest number. The mean amount number of usage that this group used C-CAP program was 1.6. The

Table E. 3 Differences in valuing based on years using a computer

Dependent Variable	GROUP		T Values
	Mean scores for the shortest period of time using computers (n=6)	Mean scores for the longest period of time using computers (n=6)	
C-CAP helped me to understand areas in which I need to improve.	4.7	3.5	0.016*
C-CAP provides a motivational way to assess my core competency strengths/weaknesses.	4.0	3.8	0.804
It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting.	3.8	2.5	0.136
I feel that using C-CAP is an efficient method to learn about my core competencies.	3.8	3.7	0.813
Through my use of C-CAP I now know more about my specific core competency.	3.7	2.5	0.081
Since I have used C-CAP, I have a better understanding of my core competency.	3.8	2.7	0.143
I learned some new ideas and concepts from C-CAP.	4.0	3.2	0.156
C-CAP is more motivational than reading a book.	3.8	3.3	0.411
C-CAP is more motivational than attending a class.	3.8	3.0	0.156
C-CAP is a self-directed learning tool.	4.3	4.3	1.000
C-CAP is helpful for professional improvement.	4.3	3.3	0.092
C-CAP is a self-directed competency development tool.	4.2	3.5	0.177
C-CAP is a user-friendly program.	4.0	4.2	0.687
C-CAP is not a very risky way to learn.	3.5	3.7	0.787
C-CAP's competency areas are clearly defined.	3.2	3.5	0.541
The information was presented through C-CAP at a pace that enabled me to learn.	3.5	3.8	0.541
C-CAP is a good example of participatory learning.	3.8	3.3	0.360
C-CAP topics are sequenced in a logical order to enhance learning.	3.5	3.0	0.341

* P ≤ 0.05

other group consisted of the six respondents who had used C-CAP program the greatest number. The mean amount of usage that this group used C-CAP program was 7.5. These data are shown in Table E.4.

As seen in Table E.4, the fewest and most usage group scores showed a significant difference regarding the following questions:

“C-CAP helped me to understand areas in which I need to improve.”

“C-CAP provides a motivational way to assess my core competency strengths/weaknesses.”

“Through my use of C-CAP I now know more about my specific core competency.”

The group that had used C-CAP the greatest number of times during the field testing period thought that C-CAP helped him/her to understand areas in which he/she needed to improve, C-CAP provided a motivational way to assess his/her core competency strengths/weaknesses, and through his/her use of C-CAP he/she now knew more about his/her specific core competency significantly more than the group that had used C-CAP the fewest number of times.

The T-test was also used to examine the independent variables of miles traveling between home and office, total hours of computer usage per week, and the average minutes spent on C-CAP each time. However, no significant differences were found between the lowest and highest groups.

Table E. 4 Differences in valuing based on number of times of using C-CAP during the field testing period

Dependent Variable	GROUP		T Values
	Mean scores for the fewest usages of C-CAP (n=6)	Mean scores for the most usages of C-CAP (n=6)	
C-CAP helped me to understand areas in which I need to improve.	2.8	4.7	0.001*
C-CAP provides a motivational way to assess my core competency strengths/weaknesses.	3.5	4.7	0.004*
It is possible to learn as much about my core competency through C-CAP as it is through learning in a workshop setting.	3.2	3.7	0.590
I feel that using C-CAP is an efficient method to learn about my core competencies.	3.7	4.0	0.628
Through my use of C-CAP I now know more about my specific core competency.	2.2	3.8	0.044*
Since I have used C-CAP, I have a better understanding of my core competency.	2.3	4.0	0.065
I learned some new ideas and concepts from C-CAP.	2.7	4.0	0.073
C-CAP is more motivational than reading a book.	3.5	3.8	0.541
C-CAP is more motivational than attending a class.	2.8	3.5	0.358
C-CAP is a self-directed learning tool.	4.3	4.5	0.599
C-CAP is helpful for professional improvement.	3.3	4.5	0.057
C-CAP is a self-directed competency development tool.	3.7	4.3	0.122
C-CAP is a user-friendly program.	3.8	4.0	0.687
C-CAP is not a very risky way to learn.	3.7	3.7	1.000
C-CAP's competency areas are clearly defined.	3.5	3.7	0.787
The information was presented through C-CAP at a pace that enabled me to learn.	3.5	3.7	0.734
C-CAP is a good example of participatory learning.	3.0	3.7	0.341
C-CAP topics are sequenced in a logical order to enhance learning.	3.0	3.8	0.111

* $P \leq 0.05$

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