ATHABASCA UNIVERSITY

A STUDY OF DISTANCE EDUCATION STUDENTS CHOOSING

COMPUTER-MEDIATED COMMUNICATIONS AS A FUNCTION OF

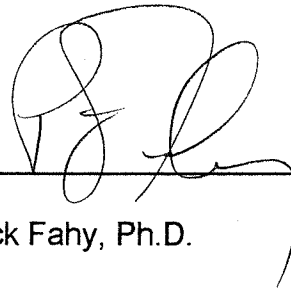CULTURAL CAPITAL: PERCEPTIONS, ACCESS, AND BARRIERS REVISITED

BY

LAUREL M. ARCHER

A thesis submitted to the

Athabasca University Governing Council in partial fulfilment

Of the requirements for the degree of

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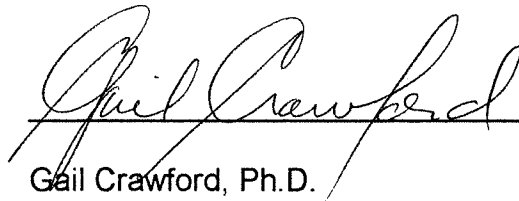
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ATHABASCA UNIVERSITY

The undersigned certify that they have read and recommend to the Athabasca

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EDUCATION STUDENTS CHOOSING COMPUTER-MEDIATED

COMMUNICATIONS AS A FUNCTION OF CULTURAL CAPITAL: PERCEPTIONS,

ACCESS, AND BARRIERS REVISITED submitted by LAUREL M. ARCHER in

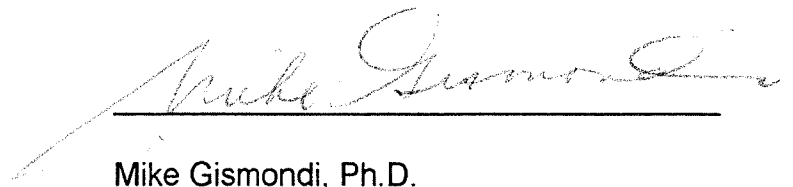partial fulfilment of the requirements for the degree of MASTER OF DISTANCE

EDUCATION.

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Date: _____May_____, 1998

i

DEDICATION

I would like to dedicate this thesis to my mother, May Partridge, for her vision of

social justice and her work in education, and in memory of my father, Charles

Hinkley Archer, who went back to school at age 60 because he loved to learn.

ABSTRACT

Distance education institutions are increasingly using computer-mediated communications (CMC) to deliver undergraduate university courses. It is important that distance educators know who this mode of delivery attracts, who it does not, and who may have difficulty accessing it and why. Without knowing students' perceptions of the inducements for and barriers to registering in CMC-based courses, the barriers they encounter in accessing CMC-based courses, and their demographics, misperceptions and barriers are unlikely to be addressed effectively. With this information, student counselling, marketing strategies, course technology selection, and resource allocation may be performed more effectively.

The purpose of this study was to discover the reasons why distance education students choose, do not choose, or cannot choose to study by CMC. The study explored the inducements for and barriers to studying by CMC, those that students articulate and those inferred from demographic information. Additionally, the question of whether a student might choose to study by CMC as a function of their possession of cultural capital (Bourdieu, 1986; Persell & Cookson, 1987) was investigated. Bourdieu's (1977, 1984) theory of social reproduction was used as the theoretical base of the study.

The study was designed to gather the required data from ViTAL/CMC and Homestudy/correspondence students in Athabasca University's (AU) Accounting 253 course. Using data provided by AU=s student record system, all the current and complete ViTAL students registered between April 30, 1996, and September 30,

1997, and a random sample of current and complete Homestudy students registered in the same period were surveyed by telephone. The sample consisted of 58 participants, 29 in each of the groups, ViTAL (CMC-based) and Homestudy (print-based).

It was found that ViTAL and Homestudy students differed in their needs and in their ability to access the required equipment to study by CMC. A significant number of Homestudy students did not know what CMC was. Students with more education, higher occupational status, higher income levels, more distance education experience, and who did not declare visible minority status in the telephone interview were more likely to choose CMC. Gender, geographical location, age, and employment status did not act as predictors of choosing CMC. Socio-economic background was not significantly related to choosing CMC, possessing symbolic and instrumental cultural capital, or socio-economic status. Possessing cultural capital and having higher socio-economic status were related to choosing CMC.

The results suggest that there are barriers to choosing CMC. Low socio-economic status and a lack of symbolic and instrumental cultural capital appear to be barriers. For distance education institutions to meet the needs of the wider student population and to not reproduce inequities, it is suggested that pre-requisite undergraduate courses should be available by both modes of delivery, correspondence and CMC. Policies should be developed and implemented to enable students without the necessary equipment and skills to access CMC.

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My thanks to my family and friends for their support and faith in me. Thank you for the love and the space. Most importantly, I would like to thank my husband, Brad Koop, whose strength and determination is an inspiration to me, and whose unconditional support gave me comfort and security during this great challenge.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

Introduction

<u>Research Problem</u>

The delivery of distance education courses by computer-mediated communications (CMC) has been generally regarded as a great leap forward in providing students with more effective means of studying at a distance. Many distance educators have outlined the benefits of this mode of delivery (Burge, 1994; Harasim, 1989; Kaye, 1989; Mason & Kaye, 1990; Paulsen, 1995). However, some distance educators have also expressed concern about the accessibility of CMC (Wells, 1991, 1993; Fage & Mills, 1996; Glastonbury & Sitaram, 1994; Kirkup, 1988; Byers, 1996; Lauzon, 1991). Currently, many distance education institutions are concentrating their resources on offering more pre-requisite and introductory undergraduate university courses by CMC, yet the potential barriers to accessing CMC have not been the focus of much of the empirical research on the implementation of CMC.

Without detailed information on who this mode of delivery attracts and why, and who may have difficulty accessing it and why, potential barriers cannot be addressed, and the optimal conditions for using CMC in the delivery of distance education cannot be met. With more empirical information on these aspects of CMC delivery and a better understanding of the implications of the implementation of CMC, the selection of course technology and course design, marketing, resource allocation, and student support and counselling services may be made more

21

effective.

Statement of Purpose

The purpose of the study was threefold. Firstly, the study was designed to explore distance education students' perceptions of CMC, and to identify the inducements for and barriers to choosing CMC from the students' perspectives. Secondly, the purpose of the study was to compare the two self-selected groups of students on the basis of demographic data in order to produce a profile of the typical CMC student in comparison to the typical correspondence student, and to determine whether there are demographic predictors for choosing CMC. Finally, a third aspect of the study was to explore whether there are barriers related to students' socio-economic status and backgrounds, and the extent to which the students appear to possess the technology and skills required for studying by CMC. The theoretical approach for the third aspect of the study, the concept of cultural capital used in the analysis, was derived from the work of Bourdieu (1977, 1984, 1986) and Persell and Cookson (1987). The research was carried out to add to a growing body of research on the optimal conditions for using CMC in providing undergraduate university education at a distance.

Research Questions

1. What inducements and barriers do students give as reasons for their choice of delivery mode (i.e. CMC/ViTAL or homestudy/correspondence)?

2. How do the two self-selected groups, ViTAL and Homestudy, compare with each other in terms of demographic variables and selected variables related in theory and practice to the adoption of computer communications technology?

3. To what extent does cultural capital mediate the relationship between socio-economic status, socio-economic background, and choice of delivery mode?

Assumptions of the Study

1. Exploratory research into the barriers or incentives arising from the use of CMC in distance education is necessary and will be useful to distance educators.

2. Athabasca University's (AU) Accounting 253 student population is representative enough of typical undergraduate distance education students as it is an introductory and pre-requisite course.

3. Given that the students made a choice to study by ViTAL or by homestudy, they will have some reasons for their decision which they can articulate via a telephone interview.

4. There are barriers that are related to the functioning of the social structure that disadvantage some students in accessing CMC. Students may not be aware of these or articulate them when asked about the barriers they encountered.

5. Distance education delivered by CMC has more social prestige as a result of the public's growing interest in information age technology, so students must have significant reasons for choosing the homestudy/correspondence mode of delivery and not CMC.

6. Publicly funded distance education institutions, though concerned about equality

of opportunity and learning condition for all in their programming, may inadvertently be disadvantaging certain groups because they are unaware of the role of cultural capital in education.

Significance of the Study

This study is unique in that it addresses aspects of the implementation of CMC in distance education delivery that have not been systematically and thoroughly studied previously. Very few empirical studies have compared CMC and correspondence students by their demographic and socio-economic characteristics, and not much is known about CMC student populations. The study seeks to discover whether there are predictors and barriers to accessing CMC, and if so, what they may be, why they are predictors and barriers, and what the implications of them are for the implementation of CMC in undergraduate distance education courses.

There are very few, if any, theoretically based explorations of the sources and implications of the barriers to accessing CMC in distance education. It is not enough to know what the presenting barriers to accessing CMC are; it is imperative to understand the underlying reasons why some students are not prepared to make the choice to study by CMC, why they may not see the benefits, and why they may not allocate their resources to acquiring the required cultural capital. This study utilizes Bourdieu's (1986) concept of cultural capital and theory of social reproduction in addressing the question of why some students are more prepared to study by CMC and in explaining the implications of implementing CMC when some

students are disadvantaged in accessing it. It is hoped that the findings of the study will permit distance educators to address the underlying causes of some of the commonly identified barriers to studying by CMC.

Limitations

1. Only one course, AU=s Accounting 253, was surveyed for lack of another course in a different discipline that was also offered by dual medium delivery.

2. Financial and time restrictions limited the inquiry to a telephone survey of approximately 15 minutes.

Delimitations

1. Given the time constraints, the researcher chose to focus on exploring a limited number of perceptions, characteristics, and relationships in the analysis.

2. The sample was derived from a single course at one tertiary distance education institution in Alberta, Canada.

3. The population that was sampled did not include those students with withdrawal, failure, or incomplete status at the time the survey was carried out because their status may have influenced their perceptions of the mode of delivery and their willingness to participate in the survey.

4. The description of a student's socio-economic status and their parents' socio-economic background was limited to three social and economic characteristics: education level, occupational status, and income level.

Definitions of Terms

Computer-mediated Communication (CMC): CMC is a method of communication that uses computer, modem, and telecommunications technology as a transfer medium permitting individuals to communicate without geographical or time restrictions (Holden & Wedman, 1993, p. 5).

CMC/ ViTAL Delivery Mode: According to the 1997-98 Athabasca University Calendar, "The Virtual Teaching and Learning Community has been developed using Lotus Notes, a popular and easy-to-use `groupware' package@ (p. 19), and "ViTAL allows people to communicate by exchanging documents, messages, software, and graphics. In a ViTAL course you will communicate with students and academic staff, participate in learning conferences, prepare and submit assignments electronically, and use specially designed interactive learning activities" (p. 5).

Correspondence/ Homestudy Delivery Mode: AU's homestudy courses are print-based courses in which a qualified tutor is assigned to each student to assist the student in understanding the material, provide motivation, and facilitate feedback and discussion of assignments. Students are provided with a course materials package which includes a study guide, texts, exercises etc. Most tutor contact is via the telephone and mail. Most courses are self-paced within a six-month contract (Athabasca University, 1997, p. 5).

Cultural Capital: Bourdieu's concept of cultural capital shows how power is conferred upon certain groups in society through their possession and consumption of goods, activities, and knowledge (of most importance in this

study) deemed by the members of society to be rare and desirable. Cultural capital (of which knowledge is an example) and economic capital are alike in a number of ways: both can be invested and accumulated, transmitted from generation to generation, especially in the form of access to elite educational institutions, and the accumulation processes of both function as stratifying devices in society (Miller, 1992, p. 64).

Demographics: For the purposes of this study, this is an umbrella term for the personal and social characteristics most often explored in the literature on cultural capital, technological adoption, and CMC student populations. The demographic characteristics used in this study are: gender, geographical location, age, ethnicity, occupation, education level, income level, martial status, and number of children.

Distance Education: According to Keegan (1990), distance education is a form of education characterized by: the quasi-separation of teacher and learner; the influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services; the use of technical media to unite teacher and learner and carry the content of the course; and, the provision of two way communication so that the student may benefit from or even initiate dialogue (p. 4).

Occupational Status: According to the Harper Collins Dictionary of Sociology, occupational status is the prestige status, social standing, and/or class position of an occupation ranked by income and education level.

Self-selected Groups: This terms refers to the AU Accounting 253 ViTAL and

Homestudy student groups. They are self-selected in that the students have chosen to register in one mode of delivery or the other.

Socio-economic Background: For the purposes of this study, this term refers to a measure of three characteristics that indicate the social and economic status of a student's mother or father. These characteristics are: education level, occupational status, and income level.

Socio-economic Status: For the purposes of this study, this term refers to a measure of three characteristics that indicate a student's social and economic status. These characteristics are: education level, occupational status, and income level.

CHAPTER II

Review of the Related Literature

Introduction

Many distance education researchers have investigated the benefits of using

CMC in distance education (Burge, 1994; Harasim, 1989; Kaye, 1989; Mason &

Kaye, 1990; Paulsen, 1995). CMC is regarded as effective in distance education

delivery because it is interactive and it affords opportunities for collaborative work

and faster feedback. However, what are the consequences of the increased use of

CMC as a distance education mode of delivery? The personal, social, and economic

barriers students may encounter in accessing CMC have been investigated at a

cursory level, but the underlying bases of these barriers have not been examined in

any depth in the current empirical research. There is a concern that students who

are already disadvantaged by their place in the social structure will experience

further inequality of condition in their educational endeavors (Wells, 1991, 1993;

Fage & Mills, 1996; Glastonbury & Sitaram, 1994; Kirkup, 1988; Byers, 1996;

Lauzon, 1991).

This chapter will report on the literature and research related to student

perceptions of CMC, the adoption of innovative technology, and access barriers to

studying by CMC. A review of Pierre Bourdieu's concept of cultural capital and his

theory of social reproduction will establish the context and importance of the current

study. The underlying theoretical position to be explored is the extent to which

students' cultural capital level may be a mediating factor between their socio-

economic status and background and their choice of study method.

<div align="center">Perceptions</div>

Introduction

       There is very little empirical research on why distance education students may or may not choose to study by CMC. Possible barriers are alluded to, but a significant gap exists in terms of empirical evidence of the students' perceptions of CMC and the realities they face in accessing it. There is a lack of empirical research on the underlying reasons for students' choice of delivery mode, and few explanations of the barriers to accessing CMC. Richards, Gabriel, and Clegg (1995) comment that "there are limited data on computer/ modem students -- their background, reasons for enrolment, and drop out rate" (p. 2).

Research on Reasons for Choosing or Not Choosing CMC

       In their literature review, Richards et al. note that Phillips and Pease (1987) found that students' interest in computer education was the primary reason for enroling in computer and/or modem classes (in Richards et al., 1995, p. 5). Richards et al. found that the reasons most students gave for enroling in a computer and/or modem course instead of a classroom course were work schedule and convenience (p. 19). Most indicated excitement and interest about computer and/or modem instruction (p. 28). The students' perceptions of the disadvantages of CMC before taking the class were: social interaction between students and instructor, lack of assignment feedback, difficulty contacting the instructor, computer problems, and

concerns about their organizational skills (pp. 28-29).

Schrum (1995) suggests that "there must be a personal and compelling reason for the adoption and implementation of any innovation" (p. 4). She reaches some general conclusions from a case study based on 95 enrolments in a CMC course on CMC for educators. The reasons the students gave for taking the course included: living in isolated communities; nothing like it available at their university; wanting to learn in the privacy of their own home; validating what they learned themselves; the subject itself; and a desire to learn the technology itself (p. 6).

Rekkedal (1990) collected information on why a group of Norwegian distance education students chose the mode of delivery they did. One interview question asked CMC and prospective students why they actually became interested in the CMC option. Eighty percent of the CMC students gave "the application of computer conferencing for communication" as the determining reason, while only 55% of the prospective students mentioned communication at all (p. 87). In terms of prospective students' perceptions of CMC, Rekkedal states that there is little understanding of what the study method entails and the costs involved: "Many prospective students over-estimate the costs involved in telecommunications" (p. 89).

The Norwegian distance education students differed in their distance education experience. The CMC students had more experience with correspondence education than the correspondence students (p. 84). Rekkedal speculates that "it may be that confidence gained through distance education makes it more probable for a person to wish to try new forms of distance studies" (1990, p.

84). Additionally, Rekkedal (1990) found that there was very little difference between the CMC, correspondence, and prospective student groups in terms of previous experience with PC's and modems for computer-based communications. He concludes, "thus, it does not seem that lack of experience with modems and computer communication has determined the decision not to enrol for electronic distance studies or to choose correspondence studies" (p. 90).

Rekkedal (1990) posits that at the Norwegian distance education institute he studied, correspondence students make a deliberate choice when they enrol in correspondence rather than computer-based distance studies. He concludes that the alternate modes available to students seem to reach different target groups, thus giving study opportunities for prospective students with different needs: "Correspondence study and electronic distance study seem today to attract different student groups who deliberately choose their preferred method" (p. 103).

Hodes (1993) studied 26 students in a university print-based distance education course, and found strong agreement among the students that a print-based course is more convenient than a traditional classroom course or computer-based course (p. 5). The participants were technical professionals, and many had taken other distance courses. The sample included all geographic regions of the U.S. and included the four principal modes of distance learning. "Since the subjects were all technical professionals, fear of computer delivery systems or `technophobia' was not thought to be a confounding factor" (p. 5).

Thus, the evidence for experience with distance education as a predictor for choosing CMC is contradictory. Rekkedal (1990) found CMC students had more

experience with correspondence, while Hodes (1993) found that students with a great deal of experience with correspondence distance education continued to choose correspondence because they found it more convenient. It is not clear from this limited research which view has the greater validity. The role of distance education experience as a confidence factor in the decision to study by CMC requires more investigation, as does the possibility that students may not know what CMC courses entail.

Thompson (1990) surveyed post-secondary students not well disposed towards correspondence study to determine the primary disadvantages they saw and to gather some recommendations as to how to improve correspondence study. The major perceived disadvantages were "the reduced interaction with the instructor and the resultant constraints upon receiving direction and feedback from the instructor" (p. 59). Other comments indicated there is a perception that greater motivation is required to succeed and that it is too easy to fall behind in correspondence courses (p. 59). Some perhaps surprising results in terms of recommendations for improving correspondence courses were found. Namely, students perceived periodic meetings with the instructors as the primary way to improve correspondence, and there was limited interest in telephone meetings with the instructor or any interaction with other students (p. 59).

The above studies show the appreciation of students for advantages and disadvantages of distance education as a method of learning. What seems clear is that the choice to enrol in one mode of delivery or another is made for specific reasons which students can articulate at one level. It appears that many students

enroling in CMC courses have an interest in computers and the technology itself. Correspondence is chosen for convenience, since one can study anywhere and at any time, and no equipment is necessary. However, its greatest drawback is restricted interaction with the instructor.

Hodes (1993) and Rekkedal (1990) both observe that computer anxiety does not appear to be a reason for choosing correspondence over CMC. This supports the suggestion that students make a very definite decision to study by correspondence rather than CMC, and that decision appears to have nothing to do with being comfortable with computers. This is a crucial observation that requires further examination. It is also important in that it opens up the possibility that the advantages of CMC in the eyes of the students are not as great as they appear to distance educators. Most of the research indicates that an interest in CMC and computer technology is a major inducement for choosing CMC, not necessarily the benefits extolled by many educators. Students who did not have a positive attitude towards correspondence study said they wanted more interaction with the instructor, not other students. It seems then that it is the instructor feedback that may attract them to CMC, not the peer interaction or collaborative learning opportunities.

More research is required to discover the reasons students choose the learning media they do in order for distance education institutions to make effective decisions about which course delivery modes to utilize and when. It is also necessary, however, to look for reasons for choice of delivery mode that students do not articulate, ones that are embedded in their socio-cultural experiences and viewpoints.

<u>Attitudes Towards the Implementation of a CMC System</u>

Since it appears that some students enrol in CMC because of their interest in computers, research on students' attitudes toward the implementation of a CMC system in a distance education institution may shed some light on the inducements for enroling in CMC courses. In a 1991 study, Athabasca University (AU) surveyed students' attitudes towards CMC. One question elicited students' responses to the attractiveness of adopting a CMC system at AU and found that "Almost twice as many students found computer mediation `more attractive' than `less attractive'" (Conway, 1991, p. 2). Though there was reasonable support for the principle of CMC in distance education, "the bimodality of several responses suggests a strong base of `opposition' to such a system" (pp. 2-3). The majority of students' perceptions on the use of computers in distance education were: "It's a good idea -- faster"; "Go for it"; or "What about those without access to computers, and the older people without experience?", "Go slowly as some will be disadvantaged" (Table Five). The results showed that those who supported the CMC scenario were slightly younger (average 30.9) than those that did not (36.8 years) (p. 3).

There appear to be strong feelings on both sides of the issue of using CMC in distance education. One attitude is that it is imperative because of the need to keep up with technological development. The other attitude shows concern about the impact on older students and those without the means to access computers and modems. These two views are common ones and represent two theories about the nature and use of technology. These views and others will be looked at more closely

in the next section.

A 1997 AU student satisfaction survey found that nearly two-thirds of students responded positively when asked about using a computer in their AU studies (AU Student Satisfaction Survey, 1997, p. 2). Also, in 1991 over one-half of the AU students surveyed claimed they would have registered in a CMC course if it had been available (Conway, 1991, p. 2). (However, as reported later in this thesis, in the period from April 30, 1996, to September 30, 1997, only 66 AU Accounting 253 students registered in the ViTAL option, whereas over 840 registered in the homestudy section. A key question motivating this study is: Why have more students not enroled in the CMC option? The choice to enrol in CMC must be based on more factors than the ones students articulate.)

Technological Adoption

Due to the limited amount of research on students' reasons for enroling in CMC and their perceptions of CMC, it may be rewarding to look at the theories and research about the adoption of information age technology and computers in order to develop a clearer picture of who enrols in CMC courses and why. Atkin (1995) points out that there is a number of competing schools of thought as to the impact of information technologies on society. Utilitarian views generally see information technology as either positive or neutral -- a harmless tool to fulfil user's needs (p. 2). Diffusion theory (Rogers, 1983) "suggests that adoption of technological innovations is a function of one's innovativeness, or willingness to try new products" (in Atkin, 1995, p. 3). According to Rogers, Ainnovators@ are characterized by higher levels of

achievement motivation than ⒜nonadopters⒝. Innovators are perceived as low risk

perceivers (Atkin & LaRose, 1994, p. 97). Previous experience is also important.

The more compatible an innovation is with the consumers' background, the more

likely its adoption (Atkin & LaRose, 1994, p. 98). One might expect that innovators of

information services would have more experience with personal computers.

Atkin and LaRose (1994) reviewed the literature on diffusion studies and

concluded that the empirical evidence points fairly consistently to a positive

relationship between early adoption and higher income, more education, and higher

occupational status. The authors suggest that high income correlates highly with

purchasing a new product. In addition, educational attainment could be linked to a

higher need to process and understand information services. Finally, higher

occupational status might imply the individual has a greater occupational need to

receive constantly updated information, for example, stock reports (p. 96). Adopters

of information services approximate the demographic profile of general `innovators',

in as much as they are typically younger and better educated (Garramone,

Anderson, & Harris, 1986, in Atkin, 1995, p. 2).

Compatibility between innovations and the existing values, past experiences,

and needs of potential users is another framework for understanding information

services adoption (Dickerson & Gentry, 1983, in Atkin, 1995, p. 2). Subsequent

research indicates that "experience with technology represents a key determinant of

adoption in the literature addressing cable and computer media ..." (Atkin & LaRose,

1988, in Atkin, 1995, p. 3). In exploring innovativeness among consumers, Ettema

(1984) found that technologies are most likely adopted if they are functionally similar

to existing ones (in Lin, 1994, p. 113). Vitalari, Venkatesh, and Gronhaug (1985) found personal attributes to be of importance as experience with computers was a key predictor, and adopters were relatively more comfortable with new technologies generally (in Atkin & LaRose, 1994, p. 99). Characteristics of adopters of innovative technology include being young, male, and better educated (Reagan, 1987, p. 3). Innovation studies have yielded conflicting results with respect to age. Since information services are rather expensive and income greatly increases with age, one would expect typical adopters of information services to be age 30-50. Younger people lack the resources to adopt these technologies readily, but are more likely to adopt symbolic innovations (Atkin & LaRose, 1994, p. 96).

A third view on the adoption of technology, the Alifestyle@ explanation, suggests that the need for greater information along with compatible beliefs or attitudes is the reason for technological adoption. According to this perspective, true "innovators" would likely adopt any technology without regard to its compatibility with one's past beliefs or technology uses. Marketing studies (Yankee Group) maintain that consumption of new information technology and services is a lifestyle pattern. Some have adopted it, making them likely to adopt still other innovations regardless of their function or compatibility (in Lin, 1994, p. 113). Even so, research suggests that adopters are relatively more comfortable with new technologies (Rogers, 1986; Dutton et al., 1987; Smith, 1994; in Atkin, 1995, p. 3).

Lin (1994) found that users with more computer experience expressed less apprehension about the computerization of society, since they are already more likely to use information services. This result could be explained by the "mere

exposure" hypothesis that suggests that one's evaluations of an item might increase with exposure to it (p. 4).

Media use behavior may be related to the perceived benefits of engaging in the behavior. In their analysis of phone service use, LaRose and Atkin (1988, 1992) found that perceived benefit was the most important predictor of use for those technologies. Reagan (1989) found further support for the existence of this predictor in his analysis of computer technology adoption (in Lin, 1994, p. 113).

Parallel to this empirically based tradition there has been an emergence of a more qualitative, critical perspective on possible ill-effects of computer technology. Recent work addresses the growing knowledge and information gaps between the "information rich" and "information poor". If information is bought and sold in a market-driven manner, some people will be disadvantaged in accessing it. "Information is increasingly portrayed as a commodity ..." (Atkin, 1995, p. 3). According to knowledge gap research, the adoption of computer technology signifies "a lower level of computerization apprehension, as well as an acceptance of the evolving information society@ (Lin, 1994, p. 113).

The above theories seem to describe the attitudes of the AU students surveyed by Conway (1991). There is support for using computers in distance education as they are seen as the wave of the future, but there is also a concern for the disadvantaged. From the literature on the theories of technological adoption one can begin to see a basis for predicting who is most likely to choose CMC as a medium for distance learning. Further empirical evidence from technological adoption research provides more specifics.

David Atkin has published an extensive amount of research on the adoption of new technologies. In a study he undertook in 1995, Atkin assessed the psychological dimensions of interest and apprehension concerning the use of computer-mediated communication services. He focused on a college sample because he believes it "offers clues about user attitudes amidst the first computer literate generation ..." (Atkin, 1995, p. 2). He is particularly interested in why consumer CMC services have not generated the interest expected: "...even though 30% of U.S. homes now have a computer, fewer than a quarter of them receive an on-line service" (p. 2).

Atkin's (1995) results showed attitudinal variables related to the social utility of on-line services to be more explanatory than demographics. However, as he states himself, the limited age and education distributions of the college student sample "may have naturally understated certain demographic influences" (p. 6). Only marital status correlated to technology attitudes. Married respondents were more likely to express income gap concerns (p. 7). He states this may be a function of their lifestyle status, that they are more aware of the importance of technology literacy in professional and financial attainment (p. 7). The predictive role for "full-time employment" suggests that those employed have the greatest appreciation for the potential of computer information services (p. 8). However, the negative relationship for electronic mail use and perceptions of life improvement suggests that exposure does not equal "affection." This runs counter to the expectation that information junkies would display greater liking for computers and their social impact (p. 8). Atkin concludes that on the whole, the findings imply a new set of attitudinal

variables to supplement demographics, and research on technology adoption patterns is necessary to explain public reaction to computer-based services (p. 8).

Lin (1994) explored the underlying attitudinal and motivational factors that may predict information service adoption. Lin adopted a combinatory approach for her research. She pooled the theoretical perspectives discussed above to assess such personal factors as: perceived benefits (relative advantage), user needs (gratifications), computerization apprehension, and information overload to construct a profile of information service users. In addition, she measured media use, literacy, and demographic factors to provide additional background explanations (p. 114).

Lin (1994) found each of the predictor constructs -- information overload, time budgeting, self-actualization, and computer apprehension -- did achieve a certain degree of success in predicting information service adoption. Although this study adopted an unconventional approach, integrating several disparate theoretical approaches, its initial success warrants further testing and refinement (p. 119).

Dutton, Rogers, and Jun (1987) found in a meta-research study that social status is a consistent predictor of adoption and use of personal computers. Ten of the eleven studies reported relationships between adoption and education, income, or occupation which indicates an association between higher social status and the adoption of computing (p. 228). The strength of the association between socio-economic status and the adoption of personal computers leads to policy concerns about inequity as a social impact of technological adoption: "An affluent family ... has greater access to computers, and thus gains more of their benefits" (p. 231).

However, the authors speculate that if computer prices continue to decline, so will the importance of the socio-economic relationship.

The meta-research study also found that, in six of the studies, middle-aged individuals were more likely to adopt home computers. Though few surveys identify gender or race as a major determinant of adoption, three studies found males more likely to adopt and use personal computers (Dutton et al., 1987, p. 231). Clearly there is a case for investigating socio-economic barriers to the use of CMC.

Atkin & LaRose (1994) claim that diffusion research studies suggest that the leveling of demographic variables over time applies not only to cable, but increasingly to all information services. So, one might expect to find that the pronounced differences noted with personal computers will also disappear as that technology reaches the flat part of its diffusion curve (p. 99).

However, Reagan (1987) brings forward the argument that there may be different predictors for the adoption of different types of media. It may be a case of function, whether the media are being used for entertainment, education, or information seeking. He also suggests that technologies go through different stages; early adoption, later adoption, and maturity. It is not clear, he asserts, that all technologies will follow this pattern or that all will have the same relations with predictor variables at each stage. He asks, "Would this be the same for technologies that take a longer time to mature or have different functions, like personal computers and information services?" (p. 15). Reagan sees a need for future research into predictors for specific technologies.

Daniel warns distance educators that CMC may not be as popular with

students as they think. He quotes from a British survey, 1996 Campaign for

Learning, that ranked people's favourite learning technologies:

> The question, `which of these learning tools do you prefer to use?' drew the following responses: books 67%; lecturing 36%; videos 36%; CD ROM/Computers 19%; audio tapes 11%; Internet 7%; none of these -- no preference 3%; none of these -- do not want to learn 3%. (Campaign for Learning, 1996, in Daniel, 1996, p. 138)

He describes a "revised" technological adoption life cycle as a bell curve with

potential time gaps between adoption of the product by the different groups,

innovators, early adopters, early majority, late majority, and laggards. He warns

distance educators that Moore (1991), in doing marketing research, found a

"chasm" between the early adopters and the early majority (Daniel, 1996, p. 139).

The analogy to the use of technology-based distance teaching methods is

clear, says Daniel (1996):

> Some students will be attracted to new technology for its own sake (the innovators). Others will quickly see the potential for more convenient or efficient learning (the early adopters). The key question is whether the pragmatic solid citizens, on whom the success of any institution depends, will be attracted to form an early majority of users? (p. 141)

He says the key lesson for distance educators is that the early enthusiasms of some

students may not be a good guide to the reactions of the majority (p. 141).

Though many of the above research studies do not address CMC directly,

their results make a case for investigating students= perceptions and demographic

and socio-economic characteristics as predictors of choosing CMC. Conversely,

these predictors may also act as barriers to enroling in CMC-based distance

education courses.

<u>Summary</u>

The research on students' perceptions of CMC is often contradictory, and thus its usefulness is limited. It does not provide distance educators with enough information to decide whether CMC is a mode of delivery that will best provide for the needs of the majority of students. The research suggests that CMC is attractive to people interested in computer technology. Though some may appreciate the potential of computer communications technology, this does not necessarily translate into affection or a belief that it will have a positive impact on society. Some students may not choose CMC because they do not know anything about it.

The research in technological adoption shows that there is a basis for establishing predictors of CMC adoption. The studies suggest that higher socio-economic status, more education, and being middle-aged and male are predictors of adopting computer technology and information services. Whether these predictors are as strong as they were when CMC was still a new innovation is an important question. Though some technologies tend to diffuse throughout the population, is this the case with CMC? The extent of the popularity of CMC technology with students is also in question. The underlying causes for technological adoption and diffusion have not been examined.

There are unanswered questions in technological adoption theory and research. For instance, why are white males more often innovators with technology? Why are socio-economic characteristics so often associated with the adoption of

computing? It is important to consider the social context in which the perceptions

and diffusion of new technology exist and access to it occurs. CMC, as it relies

heavily on technology, should be investigated in the context of the social structure. It

is here that the underlying reasons for students choosing or not choosing CMC will

be found.

<u>Access</u>

<u>Introduction</u>

Many distance educators have written position papers claiming that CMC is a

democratic medium. However, many also have concerns about access to CMC. Is it

a question of information "haves" or "have nots" or, is it a question of information

"can" and "cannots"? Who has access, who does not, and -- especially -- why?

<u>Open Access Issues</u>

Pingree et al. (1996) claim that to do anything about enabling the

disadvantaged groups to ride the "information highway" one must start by

distinguishing between the kinds of explanations for the unequal access. The

authors claim that the lack of access to the information highway is largely an

economic and policy issue, and that explanations based on lack of skills, motivation,

or information-oriented media habits locate much of the problem with the individual

(p. 331). They state that the gap between the information rich and the information

poor is typically associated with the separate but highly related issues of income,

education, and race (p. 333). The information "have nots" are often the

economically and socially disadvantaged.

Pingree et al. (1996) claim that the already advantaged groups in society can afford new technologies first. This has been true of past innovations such as colour television, VCRs, and computer technologies (Dutton et al., 1987, in Pingree et al., 1996, p. 333). Attempts to provide access to information services more broadly, as was the case with the provision of public terminals in the Santa Monica PEN project (Public Education Network), have attracted a broad spectrum of people. However, in the initial trials of PEN, it was found that PEN still largely served those who already had access to the system at home or at work (Rogers, Collins-Jarvis, & Schmitz, 1994, in Pingree et al., 1996, p. 333).

Perhaps only some will ever be able to afford the costs of CMC, and some will never. This may be disturbing to those concerned with access and equity, because computer technology correlates to employment and education opportunities more than TVs and VCRs. Pingree et al. (1996) argue that differential access to technology by rich and poor may be overcome if technology becomes very cheap or if access by the poor is subsidized (p. 333), but differential access is a social issue rather than just an individual one, and proposing to solve problems that stem from the nature of a society by such cursory measures is likely to prove futile. The reasons for choosing or not choosing CMC go beyond those of costs.

Wells writes that the open democratic nature of CMC may be compromised by variables like gender, which result in differential access to the necessary equipment (1991, p. 323). She refers to important open access prerequisites like convenient access to computers, communication software, and modems, as well as

to computer literacy training.

While decreasing costs of computer hardware and software increase the likelihood that students will already have access to a computer, what of those who do not? What of those students who may own a computer that is incompatible with any minimum computer standards established by their institution? (Wells, 1991, p. 323) Wells' review of some research on access to computers and modems indicates that access to CMC courses is dependent on technical support and subsequent training on the system. Students may sustain expensive long distance charges if the student's geographic location necessitates a long distance call to the university's computer (p. 326).

Wells (1991) questions the responsibility of the distance education institution in developing CMC systems. Some CMC systems require students to have powerful machines, where others require less powerful machines (p. 327). Wells' significantly points out the fact that the choice an institution makes is based on a value judgement. Ultimately, the decision will probably depend upon the Aavailability of institutional resources, expediency, and a value judgement regarding which party bears the primary responsibility for access to CMC courses@ (p. 327).

In her conclusions, Wells (1991) remarks that she presents these open access issues as a reminder that access to distance education courses is often related to the gender and socio-economic status of distance education students (p. 327). She asserts that it is the responsibility of universities to insure that the openness within a CMC classroom is uncompromised by elitist skill and equipment requirements. The openness of CMC should not begin only after the equipment is in

place (p. 328).

At a tele-teaching conference in 1993, Wells reiterated the existence of access barriers to CMC. After discussing the work being done in software development specifically for distance education to minimize long distance communication charges and the need for extensive user support and training, she makes a very important point:

> ...the primary barriers to successful CMC implementation are human not technological. The point cannot be taken lightly. It is critical to recognize the human source of the major problems because without remedy the result may be ineffective and costly. (p. 83)

Ultimately, Wells claims, problems of student access to computers and modems will not be removed by institutional inactivity and passive hopes that students will one day decide to purchase computers. At some point, an institution must inevitably disadvantage some students. The decisions as to which group to disadvantage at what point in time, and which options to pursue like rentals or loans to minimize deprivation of any student must be made (p. 84).

Interaction through CMC may also cost students in terms of the flexibility of location and study time, generally one of the strengths of distance education. "Requiring interaction makes students synchronize their study time and patterns, especially in collaborative work assignments" (Wells, 1993, p. 85). Ironically, she comments, "Students who are `socialized' to the isolation of self-study may even need to be `resocialized' to the educational benefits of interaction!" (p. 85).

There are a number of open access issues, the need for expensive equipment, the restrictions it places on convenience of location and time, and the

need for training and support. "In contrast to other forms of educational technology, the issue of who bears the primary responsibility for the technology seems to arise only with CMC" (Wells, 1991, p. 327). But, as Wells claims, all of what seem to be technological questions are based in human decisions. The democratic nature of CMC is presumed. The decisions made about how it will develop and when, are human decisions based on socio-cultural values. As Wells points out, distance education institutions are making value judgements, whether they know it or not.

Access to Computers and Modems

Do students have access to the required equipment? Access to computers and modems and the associated costs of using them for distance learning are possible economic barriers to studying by CMC. The research on access to computers and modems discussed below is presented in reverse chronological order so as to look at the present situation and then to see if the situation has changed over time.

In a 1997 student satisfaction survey, AU researchers found that 80% of students had access to some kind of computer at home (Athabasca University, 1997, p. 2). Over half of the students with a home computer said they had a 14,400 baud modem or better, and over half said they also had an Internet connection (p. 2). The sample was representative of the AU urban and rural student ratio (p. 3), but access by gender was not investigated.

Barbrow, Jeong, and Parks (1996) investigated the access of a group of distance education students to computers and found that 71% of students had

49

access to a computer at home or work, but only 24% of the students had computers at home. This finding appears low compared to the national average of 35% of US households with computers (p. 1281). In the Barbrow et al. study, 46% of the students had access to a modem and the Internet (p. 1281).

Judith Fage and Roger Mills (1996), from The United Kingdom=s Open University (UKOU), wrote an evaluative report on the integration of CMC into the university's program delivery. They looked at the paradox of the arrival of information age technology in open learning. The authors considered four groups in the UK, all of which potentially could gain from new technologies, but all of which potentially could be disadvantaged by their use. These groups were disabled students, women, older people, and people living on low incomes.

Fage and Mills (1996) conclude that disabled students' needs will always be a special case: "New technology needs assessment for accessibility to disabled students in the same way as all other learning media" (p. 8). For instance, a partially sighted man was unable to participate at a summer school because he could not read what was on the computer screen (p. 8). However, the authors cite comments from other handicapped students that show the benefits of new technology in their learning experiences.

The second group, women, face traditional barriers to access like previous lack of computer learning opportunities at school. At work, fewer have access to the work computer, and more of them have restrictions on access. Women have access to less equipment at home, such as a colour monitor. They were more likely to have slightly older equipment and to have competition from other members of the

household. Lower income or financial dependency is also still a problem (Fage and Mills, 1996, p. 8).

In one OU foundation course, the enrolment of women dropped from 21% in 1995, to 18% in 1996, with the introduction of the new version with the additional technology requirement. By contrast, the proportional enrolment of women in a new mathematics course (which did not require either a computer or a summer school) was higher than in earlier mathematics foundation courses (Fage and Mills, 1996, p. 8).

Fage and Mills (1996) also report that older people constitute a high proportion of students with no access to a PC. In the UKOU around 55% of older students did not have access to a PC compared with just over 30% of younger students (p. 8).

The last group, those with low incomes, encompass many in the first three groups and represent the major problem, according to Fage and Mills. Costs of computers have come down, but the level of sophistication needed to take advantage of new educational technology has kept costs relatively the same for students (p. 8). And, the low income group is no longer a minority. Fage and Mills (1996) cite recent economic issues studies to point out the growing income gap in the UK: "Over 50% of people eligible to work thus live either on poverty incomes or in conditions of permanent stress or insecurity" (Hutton, 1995, in Fage and Mills, 1996, p. 8).

Fage and Mills (1996) also cite a 1994 internal survey of foundation level students that showed that 61% of students responding had access to a computer.

However, "access" does not imply that the computer meets the OU's specifications, which have become steadily higher. Nor, often, can students easily make use of their computers for their OU studies: "Many students share a computer with other users, with restrictions imposed" (p. 7). The percentage of UKOU students overall with access to some kind of computing equipment is growing steadily: 57% in 1993, 63% in 1994, 66% in 1995 (p. 7). This is partly a result of institutional policy, claim Fage and Mills:

> However, this is likely in part to be due to the increasing number of courses that require good access to a PC. As the balance shifts in this direction, the exclusion of students without access to equipment and the proportion of students with access to equipment will thereby grow. (1996, p. 7)

In November 1994, the U.S. Current Population Survey included questions on ownership and usage of computers and modems. In a report by Brown, Barram, and Irving (1995) based on this research data, income, race, age, educational attainment, region, and geographic category (rural, urban, and central city) were cross tabulated to create a profile of those not connected to the National Information Infrastructure.

Native American minorities in rural areas have the lowest telephone penetration (75%). Rural Blacks have the lowest computer rates (6.4%) followed by central city Blacks, Hispanics and urban Blacks. Computer households composed of Asian and/or Pacific Islanders and Native Americans in rural areas have the least modem penetration, yet the Asian and/or Pacific Islanders group leads all others in terms of computer penetration (Brown et al., 1995, pp. 3-4).

In terms of age, rural seniors (55 years and older) possess the lowest computer penetration (11.9%) followed by seniors in central cities (12.0%) and the youngest (under 25 years) in rural areas (12.3%). These groups are also very low ranking in terms of modem penetration as a percentage of computer households. Yet, the youngest households with computers in rural areas rank number one in taking courses (21.7%) (Brown et al., 1995, p. 4).

For those taking on-line courses, the highest degree of participation is among those with the lowest level of education (zero to eight years) located in urban (31%) and rural (24.3%) areas, and the lowest in the central cities (13.7%) (p. 4). Generally, the lower the level of education, the lower the level of telephone, computer, and computer-household modem penetration (p. 2). The rural poor had the lowest computer penetration (4.5%) and, among households with computers, were least likely to have modem. However, the most likely users of on-line classes were low-income users in all areas, and participation in on-line courses was highest among those with the lowest educational attainment (Brown et al., 1995, p. 3). This finding is surprising in light of the other research on technological adoption. The survey did not look at gender, which is surprising considering it looked at race, age, and geographical location. These kinds of omissions result in accusations of disrespect for women's issues. In this case, only a partial picture of the nature of social groups' access to information technology is produced.

An Australian study performed in 1994 at Edith Cowan University discovered that external students' access to personal computers had risen from 13% in 1983 to 50% ten years later (Wilson, 1994, p. 250). "Access to fax machines and modems

was far less widespread and appeared to be related to the gender and employment patterns of the respondents" (p. 250). Wilson also notes that resistance to purchasing new technology was high. Most students adopted a "wait and see" attitude to purchasing the equipment required to access the "Virtual Campus". However, there were many comments about financial hardship and unwillingness or inability to purchase or lease any more equipment (p. 250).

Conway (1991) performed a telephone survey that examined attitudes toward CMC and computer ownership, literacy, and usage levels. The sample was considered an accurate reflection of the entire AU student body in terms of new versus returning status, age, and gender" (p. 1). It was concluded that "over one half of AU's students have reliable (for example `at home') access to computing equipment" (p. 1). However, the equipment was extremely diverse, and the majority of the students did not know the processing power, RAM memory capacity, or hard disk capacity of their computers. About one third of the computers had modems (p. 2). Conway concludes his report with the following comments:

> The requirements for successful implementation of computer-mediated instruction at AU (or anywhere else) are lengthy. First, that the appropriate computing technology is available to students. Second, that student attitudes and interests are supportive of computer mediation. Thirdly, that students be sufficiently `expert' to use the system in the intended fashion. (p. 3)

In reality, this may mean that other alternatives to students purchasing personal computing equipment would need consideration. Conway asserts that a substantial percentage of AU students have no computer access, and no apparent interest in computer-based AU courses. Therefore, the implementation of computer-mediated

delivery in the longer term suggests "the need to preserve (and perhaps even enhance) the existing print-voice delivery model" (Conway, 1991, p. 4).

The Rekkedal study (1990) also investigated the availability of PC's and modems finding that there was no marked difference between the CMC, correspondence, and prospective student groups concerning availability of computers. Close to 70% in all three groups had their own PC (p. 88). Whether the PC was powerful enough for the CMC system requirements was not addressed. Rekkedal concludes that "equipment does not seem to be a major barrier towards recruitment to electronic distance studies ..." (p. 88). This somewhat contradicts the conclusions of the AU study.

However, Rekkedal (1990) found lack of access to modems to be a barrier. All the CMC students had access to modems (50% at home only and 30% at work only, and 20% both at work and home) while only 35% of the prospective students (15% only at work) and 28% of the correspondence students (only 8% at home) had access to modems. It appears that the availability of modems is one barrier to accessing CMC courses (pp. 88-89).

Rekkedal (1990) found there were no significant differences in terms of geographical distribution:

> One might expect that a new method such as electronic distance education, demanding technical equipment and updated information would recruit more people from centralized areas (with a highly developed service sector industry) than would correspondence. This seems not to be the case. (p. 87)

Rekkedal found that the number of non-starters was higher among the CMC students, a fact that he assumes relates to the students experiencing technical

difficulties (1990, p. 82). However, the CMC students were more likely to complete their courses (p. 82). He concludes by stating that the "lack of modems and familiarity with the technology involved is still a major barrier for recruitment to electronic studies" (p. 103). Rekkedal did not look at gender or ethnic background. As well, the sample was very small so categories were collapsed in the analysis. Thus, the generalizability of the study results is low.

The research on access to computers shows that access is less of a problem now than it was. However, it is still a problem for a significant number of students, and the quality of the access and equipment is also an issue. Thus it is probably the case that convenient access to institutional standard computer equipment is still a barrier to participating in CMC. There is evidence that access to modems is a significant barrier for potential CMC students. It appears that disadvantaged social groups may have inequitable access to the required equipment.

Summary

CMC is a mode of delivery that requires students to have access to expensive and sophisticated equipment. Many, if not most, distance education institutions have chosen to leave the responsibility for access to the equipment completely with the student. Some students will not be able to access CMC because they do not have access to computers and modems. However, there may be other barriers for some students beyond quality access to the required CMC equipment. The socio-economic characteristics of CMC students may provide a basis for discovering further barriers to access, and are discussed below.

Introduction

Attitudes toward computer technology and access to equipment are only two possible barriers. The literature suggests that disadvantaged social groups are more likely to experience economic barriers in accessing CMC. This is noted in the Dutton et al. (1987) meta-research study and Fage and Mills (1996). Wells' (1991) claims that the barriers distance education students face are related to their gender and socio-economic status. In this section, the literature related to these barriers to CMC will be reviewed as well as a related barrier -- computer literacy.

Demographic Research on Students Studying by CMC

From the demographic research on students studying by CMC (hereafter, CMC students), one may be able to discover whether socio-economic characteristics act as barriers to accessing CMC. Some research does exist on the demographics of the CMC students, but it is limited. However, keeping in mind the research on technological adopter profiles and access to computer technology, it may be possible to find demographic predictors for the adoption of CMC as an educational medium.

Rekkedal (1990) found that correspondence students had less previous education than the CMC students (p. 84). The groups also differed in their experience with distance education. The CMC students had more experience with correspondence education than the correspondence students (p. 84). Rekkedal

(1990) also found that CMC students were older than the correspondence and prospective students (p. 83). All the CMC students were employed with 65 percent in what were defined as higher positions, and a large percentage of the correspondence and prospective students were not employed, or employed in lower level positions (p. 85). CMC students were to a larger extent established in a family situation (pp. 85-86). Finally, as mentioned earlier, there was no significant difference in terms of geographical distribution.

Richards et al. (1995) investigated the demographics and experiences of 217 students studying by CMC compared to a group of 263 students enroled in traditional classes at a large urban multi-campus community college. They found that the typical computer/modem student was part-time (64%), female (71%), older than the traditional student (26-35 years old), white (76%), and employed full-time (49%)(p. 38). It was found that the variables of age, employment, enrolment, and final grade differed significantly between computer and/or modem students and traditional students. Two variables, gender and ethnicity, showed no difference (p. 14).

Attempting to find demographic predictors for the selection of CMC as a learning medium yields the conclusion that CMC students are more likely to be part-time students, employed, and older than traditional and correspondence students. Dutton et al. (1987) also found that higher socio-economic status, education level, and being male are also predictors for computer adoption. The two studies also support the suggestion that there are economic barriers to accessing CMC. Barriers like gender, geographical location, age, previous education level and distance

education experience, ethnicity, and computer literacy need further investigation as the demographic research on CMC is very limited and some data are contradictory. After an extensive search to find more demographic research on CMC students, very little information was found. Developing a profile of the typical CMC student appears to be a worthwhile enterprise.

Gender. Kirkup (1988) has investigated the implications of the increasing use of microcomputers in DE at the Open University. She claims that unless the "new medium [CMC] is accessible to all potential students and staff, it will disadvantage and discourage some" (p. 1). She is particularly concerned about the effect it might have on women. "For the first time in developed countries, we are beginning to use a medium in distance education which is unequally accessible to both sexes" (p. 1).

In addition to some old OU statistics which have been updated (they were cited in the previous section on access), Kirkup cites other statistics to make her case. For example, at OU "Women are less likely than men to register for courses which contain a compulsory computing component, even when the computing facility is provided..." (1988, p. 7).

UK surveys suggest that most computers are bought for adult males or boys for work-related activities and games (p. 7). Eighty-five percent of boys with a microcomputer reported it as being bought for them or another male; none said that it was for their mother or sister. Of the girls with a computer at home, only 14% reported that it was bought for them (p. 8). Between 1981 and 1986, the number of women applying to university computer science dropped by half (p. 8). "At school in informal computer clubs' girls form a very small proportion of regular attenders:

10%" (Culley, 1986, in Kirkup, 1988, p. 8).

Conway (1991) found some significant associations between responses to questions related to computer usage, experience, and gender. Male students were more likely than female students to claim knowledge of computing terminology and males were more frequent users of computers and software (p. 3).

Pingree et al. (1996) state that new technologies are traditionally seen as more friendly and used more frequently and fully by men than women. This raises the concern that greater reliance on new technologies for information and social power will further disadvantage women. They note that even when PEN's public terminals made information services more accessible to women, only 30% registered for access to the system. And, many did not follow through to use the system (Rogers et al., 1994, in Pingree et al., 1996, p. 333). In the Pingree et al. (1996) study, however, they found that women were heavier users of a CMC system than men when access and equipment were supplied in their own homes without cost.

In contradiction to Kirkup's (1988) findings, Richards et al. (1995) found no significant difference between the number of women registered in CMC as opposed to traditional courses (p. 38). Barbrow et al. (1996) and Morris (1988-89) found no difference between gender and attitudes towards computing. And, Pingree et al. (1996) found that women used the CHESS system more heavily than did men (p. 342). This contradicts Conway's (1991), Dutton et al.'s (1987) and other technological adoption studies' findings that males used computers more frequently.

Kirkup's figures are old, but the 1994 OU statistics cited previously in Fage

and Mills (1996) showed women students still without the same level of access as male students. The Conway (1991) and Dutton et al. (1987) studies are also dated, but they support Kirkup's suggestion that women in general do not adopt computer technology as readily or in as much depth. The Roger et al. (1994) findings on the PEN project cited in Pingree et al. (1996) also affirms that there may be a gender barrier. The other research on technological adoption also points to the conclusion that adopters of information technology and services are usually men. Will the gap widen or close over time? Looking again to technological adoption theory and research, it appears that technological diffusion curves tend to flatten out. From that perspective it will just be a matter of time before gender is not an issue. However, none of the research is particularly convincing one way or the other, and some researchers suggest that technological adoption patterns differ depending on the technology in question.

The situation is far from clear, but the evidence points to the importance of considering gender inequities like access when designing and implementing CMC programs. There is a need for more research to determine if women do not register in CMC courses for strategic reasons, because of economic inequities, and/or computer comfort and literacy levels.

Is women's access an economic issue or a social issue, or both? It has been suggested that women are not as visible or active in the computer world because of socialization patterns in society. This suggests that women's life strategies do not include learning about and using computer technology to the same extent because the social and economic rewards for women are not the same as they are for men.

61

Further discussion of this issue will come in the section on cultural capital.

Geographical Location. Lauzon's (1991) concern is that rural groups will be disadvantaged in accessing CMC courses. He examines rural groups in terms of their access and attitudes to CMC. For rural people there are situational barriers. These barriers include: geographic isolation, weather, course and/or program scheduling, family responsibilities, time constraints, and limited access to advanced instructional technology (Gray and Sullins, 1988, in Lauzon, 1991, p. 2). Lauzon thinks CMC can help rural communities overcome these barriers, but there are other barrier. "The very technology that has allowed us to overcome those situational barriers may form the basis of a dispositional barrier, namely computer anxiety" (Lauzon, 1991, p. 3). Lauzon warns distance educators that just because they may use computers daily, not everyone else has the use of this tool, and they may not perceive the same benefits from its use (p. 3). His study found that only 44% of the students enroled in a sponsored Independent Study Program of the University of Guelph felt that computer-conferencing would be useful in their studies, and only 33% would feel comfortable using this technology (Lauzon and Moore, 1987, in Lauzon, 1991, p. 3). Despite these limitations, Lauzon argues, the disadvantaged can benefit indirectly through computerized education. They can develop some computer literacy that can then be used to their advantage in the job market (Lauzon, 1991, p. 3).

Anne Byers (1996) suggests that rural communities face barriers of access such as lack of physical infrastructure due to low population density and high installation costs. Lack of awareness of the benefits of information technologies is

another, while technophobia, the need for training in the use of information technologies, and the cost of information technologies relative to their perceived value are other barriers (pp. 1-2). "The issue is not really information have and have nots, but rather information can and cannots" (Michael Staman, 1994, in Byers, 1996, p. 2). However, the issue goes beyond access and computer literacy. Being geographically on the periphery, what benefits of CMC do rural people perceive? What would motivate them to access it? The cost of the equipment and the long distance charges may not seem a worthwhile investment when their life is intimately tied up with the land.

Rekkedal (1990) found no significant difference in the geographical location of CMC students compared to prospective or correspondence students. Rekkedal's findings contradict the findings of the other researchers. Perhaps this is because his study was performed in 1989 and the users of computer technology were "early adopters" as described in diffusion studies. However, the Brown et al. (1995) report on the 1994 U.S. study on access to the National Information Infrastructure found that access to computer technology is much more limited in rural areas. Rural users often face higher costs for long distance charges as they must connect to an Internet node in a larger centre. Access to and experience with computers may be more of a problem for farming and northern communities as many urban students have access to and experience with computers as a result of the nature of their work.

Age and Education. David Morris (1988-89) performed a telephone survey to examine the relationship between age, education, gender, and household income,

and attitudes towards computing. The results showed that for this rather large

sample (n=380) sex and household income did not seem to be related to attitudes

toward computers. Years of education and age, however, do relate significantly to

such attitudes (p. 76). Furthermore, age is indirectly related to attitudes toward

computer-based education. As a group, those who are older tend to have less

formal education:

> Indeed, education is more likely to be of greater importance in
> determining attitudes toward computers than is age, in-and-of-itself.
> Education is more likely to have an effect on attitudes toward
> computers regardless of age. Those better educated, whether young
> or old, will probably be more favourably disposed to those rapid
> advances in technology. (p. 77)

Conway (1991) found that non-users of computers tend to be somewhat

older (average age 37.5) than users (32.4). Supporters of the computer-mediated

scenario tend to be slightly younger (average age 30.9) than those who did not

support it (36.8) (p. 3).

Barbrow et al. (1996) focused their research on the relationship between

computer attitudes and demographic variables such as age, gender, and

educational levels. Their results contradict the suggestion that social attributes affect

attitudes towards CMC or computers. Respondents overall attitudes toward

computers were relatively positive and unaffected by age and type of work (p. 1281).

Barbrow et al. conclude that, overall, respondents' experiences with and attitudes

toward using computers did not seem to be a barrier to implementing interactive

computer systems in distance education (p. 1281). Again there is contradictory

evidence as to whether a negative or uncertain attitude toward computers is a

barrier to accessing CMC. Though Barbrow et al. found age and education not to be a barrier, the other studies' results indicate that age does make a difference in experience and attitudes towards computer technology. Education and age together make a difference.

Pingree et al. (1996) state that in terms of the education level of users, there is a real danger that the sophistication and complexity of new technologies (often computer-based, print dependent, requiring keyboard use or otherwise assuming background skills) will allow those with more successful formal education to understand them well enough to use them first, and forever better (p. 333). Age is also an issue as younger people are more likely to be more familiar and comfortable with computers and other technologies (p. 333). The authors contrast the disenfranchisement-perpetuating nature of the gender barrier scenario with age barriers claiming that new technologies could equalize or reverse current age-related social power differentials (p. 333). Younger people with computer skills may increase their social power to the detriment of older workers.

Taking the technological adoption research into account, one can conclude that age and education probably do make a difference in accessing CMC in a number of ways. Younger, more educated students have more experience with computers and would be more likely to support and register in CMC courses, if they had access to the equipment. Age and education level are attributes that can be barriers to accessing and using CMC technology. This suggests that computer anxiety and literacy levels may in fact act as barriers to CMC participation.

Ethnicity. Access by minorities to CMC is also an issue. As Harvey (1986-87)

points out, it is often minorities like Blacks and Hispanics (and in Canada, the native people) who are the poorest groups and have less education than whites. Also, new technologies run the risk of being seen as "white and therefore irrelevant" (Pingree et al., 1996, p. 333). If information or other services, in this case distance education, provided through new technologies are used less by the poor, the less educated or minorities, and if these technologies are beneficial in any of several expected ways, then gaps between advantaged and disadvantaged will grow (Pingree et al, 1996, p. 333). Pingree et al. claim that differences between educational, ethnic, gender, and age subgroups (beyond their covariance with income) "all would rest instead on skills, media use habits, or motivation" (p. 334). There are still concerns that if they solve the access problem some groups may have insufficient skills or training to use information rich media. Also, they found that some groups' expectations of the benefits of the use of such media may make them see little utility in using them. They may see little prospect of improving their lot, and thus be generally unmotivated to spend time and effort on information seeking to do so. (p. 334)

Pingree et al. claim that though differences are found between social groups in these areas, a skills-based explanation has been difficult to support (p. 334). Therefore, they claim habit or motivation-based explanations to be more useful as an explanation for most existing knowledge gaps. However, they concede that motivation alone may not be sufficient to close gaps and that education level may affect what is gained from information media, even when motivation is high. Finally, equal access does not equate to equal use: "... the experience of the PEN project cautions that while access broadens participation and creates new opportunities for

participation by the disadvantaged, it does not necessarily equalize use" (Rogers et al., 1994 in Pingree et al. 1996, pp. 334-335).

Many sociologists would disagree with the Pingree et al. (1996) assessment of the usefulness of a habit or motivation-based explanation for differences in use of computer technology. It is too simplistic and lacks a social and historic context. Bourdieu's theory of social reproduction, which will be examined in the fourth section of the review, suggests that inequities in education, income, and social mobility that lower status groups experience are based in the nature of the capitalist society. Commonalities of lower skill, expectation, and motivation levels in social groups must be connected to the social groups' experience. They are not individuals' attributes, but a consequence of the groups' experiences in the social structure and the amount of capital they can inherit and acquire.

Pingree et al. (1996) performed a study with a group of HIV+ out patients who were provided with the access in their homes to an interactive computer system called CHESS. The situation was such that motivation was high to use the system as the patients wanted information about their illness. There was obvious social support available as well as technical support. Access was not an issue as everything they needed to be on-line was provided. Who used CHESS? Younger HIV+ individuals, as expected, used CHESS more often and for longer. Women were heavier users than men of the information services overall, and minorities were as well (p. 342). However, minority group members actually used CHESS slightly less overall, primarily because they made less use of Discussion Group than whites, but used all other services more. The data were analyzed in reference to particular

services available on CHESS so the results are not particularly useful for present purposes. For example, education was a predictor for the use of the library service, but not for other services.

The CHESS sample was not representative of the general population, and the number of women was extremely small. It should be noted that the small sample size limits the researcher=s ability to avoid falsely rejecting the null hypothesis. This is particularly true for the race and gender results because there were only 17 women and 22 minorities among the sample of 107 (Pingree et al, 1996, p. 344). As well, the average education level of the sample was quite high. As such, the results of the study, though very interesting, are not particularly generalizable.

However, Pingree et al. (1996) conclude that CHESS appears to have successfully avoided traditional selection biases of information systems. Heavy overall use was spread evenly across social groups. Variations between groups were relatively small, generally accounting for little of the substantial variation in amount of use. More importantly, the researchers claim, is that where such differences were found they were "generally not those that would perpetuate differences in social power" (1996, pp. 345-346). "In summary, it is clear that a computer-mediated system does not present a barrier to groups usually on the low end of knowledge gaps" (Pingree et al., 1996, p. 347). This may be so in this instance where the participants were motivated, trained, and provided free access in a supportive context, but is this true of the average student studying by distance education? The other research suggests that it is not.

The Brown et al. (1995) report suggests that ethnic groups do have unequal

access to computers and modems. Minorities may face barriers to CMC that are based on their experiences as social group. Income and education level inequities appear to be barriers to access to CMC for minorities, and so is the perception that the benefits of computer technology do not outweigh the effort of learning to use it and the cost of purchasing it. The effort and cost of going on-line may simply not appear to translate into the same rewards as they might for whites, thus leaving disadvantaged groups with little reason to overcome the economic and skill barriers they may encounter. As we will see in the last section, this may be true for certain groups of women as well.

Computer Skills. Harvey (1986-87) writes:

For those with poor educational backgrounds, especially if they simultaneously bear the burden of racial or sexual discrimination, the changeover from an industrial society to an information society presages a decline in job prospects and economic opportunity. (p. 54)

Harvey further argues that this is inevitable given the conspicuous absence of official policies regarding the development and use of high technology (p. 54). The existing social structure and its consequent school assignment patterns separate students according to their race and socio-economic standing. This means that those who have the lowest income and status also tend to be those who receive the least education, and vice versa (p. 54). Harvey's point is that if education is going to be an even more critical factor in the high tech society than in earlier generations, the income and status gap could become even wider (p. 55).

Harvey (1986-87) claims there is varying access to computer technology for learners nationwide, but it is quite clear that "persons from higher income

69

backgrounds are far more likely to have access, whether through school, jobs, or homes" (p. 55). Harvey quotes David Moursand, editor in chief of <u>Computing Teacher</u>: "Computer equity, rich versus poor, is one of the biggest problems we have" (p. 55). This inequity will be passed on to the next generation. In the future, computer skills will become even more important in employability.

Blacks, because they have lower incomes and occupational status, are also less likely than whites to acquire computer mastery on their jobs. It is also less likely that there will be training programs for their children in the schools that they attend, which extends the computer literacy gap into the next generation (Harvey, 1986-87, p. 55). As might be expected, Harvey says, the availability, and consequently the utilization of computers in schools, seems related to the social class grouping of the student body. While 80% of the 2000 richest school districts own micro-computers and have them available for student use, only 40% of the poorer school districts own microcomputers. In the case of school districts where there is a high level of poverty among the students enroled, only 12% own microcomputers (Cole, 1985, in Harvey, 1986-87, p. 55). This situation obviously provides those students who are already in more favoured circumstances with an even greater advantage over their less fortunate counterparts in the long run.

ᴀIs there a new type of illiteracy? Will computerization create so many new divisions so much as it will exacerbate those that already exist?@ asks Harvey (1986-87, p. 57). He claims the trends suggest that those persons who are at the bottom of the socio-economic order and who disproportionately female and people of colour, will not gain as a result of computerization, but in fact will find themselves

falling even further behind those persons who are able to capitalize on their superior levels of education and their more favoured status in society (p. 57). Harvey is in agreement with Bourdieu's position that it is cultural capital and social position that enables the already advantaged social groups to reap the rewards from the education system.

Schrum (1995) argues that a low level of computer skill is a barrier to learning by CMC. Learners need to have technological skills so that they are comfortable with computers and able to use a word processor. Individuals who try to learn information technologies as they learn about computers seem to give up easily. Change in practice and continued use of information technology is dependent on the ease and costs of access (p. 8).

Conway (1991) also points out the importance of experience and comfort with computers in using CMC for distance education. "The pattern of computer usage among AU students is essentially bimodal, with 31% having never used a computer, and 48% using it at least every few days" (p. 2). In terms of experience in computer usage, familiarity with common computer terminology, and formal computer training, Conway found AU students are "moderately experienced and comfortable with computers" (p. 2).

On the other hand, Pingree et al. (1996) suggest that, in reality, differences in information seeking and computer skills do not present a great barrier to using CMC systems. In situations that motivate people to seek information and services, providing access to such systems may be sufficient to overcome pre-existing difference in skills and information-use habits. The final question that remains, she

71

suggests, is exactly how to provide such access beyond research settings (p. 349).

Hodes (1993), Rekkedal (1990), and Pingree et al. (1996) all suggest that computer experience and skills are not determining factors in participating or not participating in CMC. However, the Rekkedal and Pingree et al. empirical evidence is methodologically unconvincing because of the small sample size. Harvey (1986-87), Schrum (1995), Conway (1991) and others in the research on technological adoption claim that computer skills and experience are likely to be a factor in using information age technology. As the evidence is either unconvincing or dated, the issue of computer skills as a barrier to choosing CMC requires more thorough investigation.

Summary

It appears that age when related to education level and education itself affect attitudes towards CMC and computer skill and comfort levels. Computer skills and comfort level appear to be a factor in adopting CMC. However, skill, motivation, demographic, and technological adoption explanations only partially illuminate the reasons why students may or may not choose to study by CMC. These explanations do not sufficiently capture the social processes that create barriers for some students. Lack of income and ownership of computer and modem equipment are economic barriers. These are more easily discernible and perhaps even more easily addressed than the "social" barriers that may be hidden by the explanations themselves. It is for this reason that a sociological perspective on the barriers to accessing CMC may be of use. The question as to whether women, groups with low

socio-economic status, aboriginal Canadians and other minorities, and rural dwellers may encounter other barriers related to the functioning of social structures requires further investigation.

<div align="center">Cultural Capital and Access to CMC</div>

Introduction

Pierre Bourdieu, a French sociologist, has developed what he calls a theory of "social reproduction." In his view, those in power do not just pass on their material wealth, or economic capital, to their offspring, they also try to insure that their children acquire cultural capital. The inheritance of cultural capital provides their children with social advantages and helps them maintain their social position. For instance, in a society that has very few literate members, knowing how to read and write gives one an enormous advantage over those who are illiterate (Bourdieu & Passeron, 1977, p. 211). In this same way, computer literacy is cultural capital: "Similarly, in a culture that depends increasingly on computers, those with early training in sophisticated computer skills may have valuable advantages over those who do not" (Persell and Cookson, 1987, in Zweihenhaft, 1993, p. 211).

Cultural Capital

This section of the literature review will investigate the idea that the mediating factor between socio-economic status and background and choice of delivery mode is cultural capital. CMC requires some confidence and skill in using computer and

<div align="center">73</div>

modem technology. Comfort with using computers, computer skills, and the motivation and confidence to approach new innovations like information age technology may be seen as a new form of cultural capital. As in the accumulation of economic capital, it is the cultural capital that one possesses already that enables one to possess more. It may be that students with more "traditional" forms of cultural capital are able to appreciate the value of and appropriate this new form more readily. This possession of computer and modem technology and computer comfort and skills may be the best predictor for choosing CMC.

Bourdieu (1977, 1984, 1986) claims that we live in a capitalist society, not just a capitalist economy, and therefore there are other forms of capital which can be accumulated. Bourdieu (1986) posits that capital can present itself in three fundamental guises: economic, cultural, and social (p. 243). Each of these types of capital function at both macro and micro levels, for a class and for an individual. Having "inherited" cultural capital from one's parents to begin with, means one will be able to accumulate it better in the education system. Having capital, one can gain more capital. Bourdieu claims that cultural capital can itself exist in different forms:

> ... in the embodied state, that is, in the form of long-lasting dispositions of the mind and body; in the objectified state, in the form of cultural goods (pictures, books, dictionaries, instruments, machines, etc.), which are the trace or realization of theories or critiques of these theories, problematic, etc.; and in the institutionalized state, a form of objectification which must be set apart because, as will be seen in the case of educational qualifications, it confers entirely original properties on the cultural capital which it is presumed to guarantee. (p. 1986, p. 243)

Bourdieu (1986) sees the domestic transmission of cultural capital as the

74

"best hidden and socially most determinant educational investment" (p. 244). Academic ability is itself a product of an investment of time and capital (p. 244). The educational system contributes to the reproduction of the social structure by sanctioning the hereditary transmission of cultural capital (p. 244). Since one can accumulate cultural capital in the education system as well, regardless of one's inheritance of it, it makes the system appear to be more democratic than it is.

The embodied state of cultural capital, culture or cultivation, costs time, which must be invested personally by the investor. Like the acquisition of a suntan, Bourdieu (1986) claims, it cannot be done second hand (p. 244). Because it is linked to the individual as a biological singularity and is subject to hereditary transmission that is always heavily disguised or even invisible, it manages to combine the prestige of innate property with the merits of acquisition (p. 245). Embodied cultural capital is predisposed to function as symbolic capital as it is unrecognized as capital and recognized as legitimate competence. Furthermore, any cultural competence (for example, being able to read in a world of illiterates) derives a scarcity value from its position in the distribution of cultural capital and yields profits of distinction for its owner (p. 245). Not everyone has a share of the profits which cultural capital secures in a class society. This is because all parents do not have the economic and cultural means for prolonging their children's education beyond the minimum necessary for the "reproduction of the labour-power least valorized at a given moment" (p. 245).

The accumulation period for cultural capital covers the whole length of socialization, and the link between economic and cultural capital is established

through the mediation of the time needed for acquisition (Bourdieu, 1986, p. 246).

For instance, if one has a graduate degree, one would have spent more time not

working than someone who needed to support a family right out of high school.

However, there are exceptions which Bourdieu recognizes and explains.

It is through competition between the individual and the other possessors of

capital competing for the same goods and the scarcity of the necessary resources

that the social value of the goods is generated. The structure of the field, that is, the

unequal distribution of capital, is the source of the specific effects of capital, for

example, the appropriation of profits and the power to impose the laws of

functioning of the field most favourable to capital and its reproduction (Bourdieu,

1986, p. 246). This is why the education system rewards forms of cultural capital like

language and style. They are not taught, they will have already been accumulated.

And, the expectation is there to have them, and those with them are rewarded. Is

this the case with computer comfort and skills in CMC courses? Presently, students

are expected to have the required equipment and skills when they register for CMC.

If one does have the "prerequisite" forms of cultural capital then one is rewarded by

attaining a more prestigious academic qualification, one obtained by CMC, not

Ajust@ correspondence.

Cultural capital in the objectified state is transmissible in its materiality.

However, to possess the machines (a computer modem for example) or cultural

artifacts, one needs only economic capital. However, to appropriate them and use

them in accordance with their specific purpose (defined by cultural capital of

scientific or technical type incorporated in them), one must have access to

76

embodied cultural capital, either in person or by proxy (Bourdieu, 1986, pp. 246-47). To have a computer is symbolic cultural capital, to be able to use it is instrumental cultural capital (Persell and Cookson, 1987).

The institutionalized state of cultural capital is the objectification of cultural capital in the form of academic qualifications. By conferring institutional recognition on the cultural capital possessed by a student, the academic qualification makes it possible to compare qualification holders (Bourdieu, 1986, p. 248). "Furthermore, it makes it possible to establish conversion rates between cultural capital and economic capital by guaranteeing the monetary value of a given academic capital" (p. 248). Institutionalized cultural capital's worth is also dependent on scarcity and competition. Academic qualifications are devalued when more people possess them. Once something becomes available to all, it must be devalued to keep the logic of distinction going and the advantage on the side of the dominant class. Bourdieu's focus then is on the processes through which cultural knowledge and styles operate as carriers of social inequality.

The concept of cultural capital enables Bourdieu to analyze general cultural background, knowledge, disposition, and skills as analogous to economic goods produced, distributed and consumed by individuals and groups.

> As such, culture -- whether viewed as objective forms (books, works of art), practices (museum visits, concerts), or the institutional currency of academic credentials -- is susceptible to treatment in terms of the laws governing macro and micro-economic relationships. (Swartz, 1977, p. 547)

Using the concept of cultural capital in regards to the barriers to accessing CMC illuminates the social context of the problem.

Cultural Capital Studies. Most of the empirical studies investigating the concept of cultural capital show support for the proposed relationship between cultural capital and educational system outcomes. For example, Bourdieu's ideas have been used as theoretical constructs for explaining the social mobility of public versus prep school graduates (Zweihenhaft, 1992, 1993). Persell, Catsambis, and Cookson (1992) have used Bourdieu's theory of cultural capital to illuminate the relationship between class and gendered pathways in education. DiMaggio (1982) showed the impact of cultural capital on students' high school grades. DiMaggio and Mohr (1985) performed a follow up study to the 1982 DiMaggio study to demonstrate the effects of cultural capital on the educational attainment, college attendance, college completion, graduate attendance, and marital selection for both the men and women studied in 1982. Katsillis and Rubinson (1990) performed a national study on high school seniors to investigate the role of cultural capital in the relationship between social background and educational attainment, and found a positive relationship between the possession of cultural capital and social background. This is only a selective listing of previous research using the concept of cultural capital.

Bourdieu has been at the centre of the debate about the "new" educational sociology, but his prominence outside Europe is limited. This may be partially due to the lack of availability and the quality of the translations of his work and the critical nature of his sociology. It has been seen as irrelevant for the study of North American education systems because they are structured differently from those in France and England. However, a significant number of educational sociologists

dispute this, and Bourdieu's 1977 book, co-authored by Passeron, <u>Reproduction in Education, Society and Culture</u>, has become one of the most widely cited social science books in print.

<u>Social Reproduction Theory</u>

It is beyond the scope of this review to discuss Bourdieu's complex theory of social reproduction in its entirety and the scope of the empirical research and theoretical debates it has initiated. However, a general discussion is required to establish the context of the concept of cultural capital and its role in the study's investigation of the implications of using CMC in distance education delivery. Using CMC in distance education may appear at one level to be a mini-information revolution, making learning more democratic. However, at another level it may simply be widening the gap between educational conditions, if not opportunity. Institutions implementing new technologies in trying to be more effective and efficient in offering their programs of study, may in fact be reproducing the social inequities they may wish to alleviate. Technology alone cannot solve social problems of inequity, and it can be used unwittingly to maintain them, or worse.

The following is a list of points on which Bourdieu's (1977, 1984) theory of social reproduction rests:

< The education system serves to maintain rather than reduce social inequality by reinforcing status inequities among classes. This explains his conception of the school as a conservative force.

< Bourdieu complicates the category of class according to the effects of cultural

capital and many other factors like age, sex, geographical location, trajectory, etc., conceiving of it in a Weberian sense.

< Through the apparently meritocratic workings of the education system, upper class interests are preserved without violating the principles of democratic ideology. They are obscured and legitimated in the process of reproducing social hierarchies through transmuting them into academic hierarchies. Cultural capital is the key to this reproduction.

< Cultural capital becomes an important intervening variable as a society becomes more democratic. Demands for equality of opportunity and meritocratic selection increase which leads to the emergence of indirect mechanisms of reproduction, particularly those that work through education.

< The educational system itself promotes unequal levels of academic performance and attainment by rewarding students who already have higher levels of cultivation.

< Academic performance and opportunities are linked to cultural and parental background through Bourdieu's concept of class ethos -- "a system of implicit and deeply interiorized values which, among other things, helps to define attitudes toward cultural capital and educational institutions" (Swartz, 1977, p. 548). A student with a class ethos congruent with the structure of the education system is more likely to succeed.

< The educational system "retranslates" the initial degree of educational opportunity and amount of inherited cultural capital into characteristically

academic traits. Academically successful lower-class students rely more heavily on the school for their acquisition of cultural capital.

< Certain forms of cultural capital bring different rewards for different social groups.

< Bourdieu's emphasis is on selection through self-selection. Agents are not powerless, but they are also products of their class. Since working class youths stand little chance of attending a university, they do not aspire to high educational attainment.

< Class "habitus" is the generative, unifying principle of conducts and opinions of a class. It is durable yet transformable and it provides the individual with a set of objective probabilities tied to his/her particular class.

< To move from one class to a higher one, individuals and groups must change their habitus by acquiring the appropriate forms of cultural capital.

< Macro-level patterns of social-class inequality and unequal distribution of cultural capital are linked to micro-level processes of pedagogy, evaluation, and curriculum.

< Style rather than content is the mechanism whereby cultural privilege is reinforced and cultural disadvantage is unattended.

< The educational system is "relatively autonomous" in relation to the rest of the social structure.

< Devaluation of academic qualifications or any cultural products or practice occurs when they become too available, or too easily accessible.

<   What the competitive struggle for capital makes permanent is not different

conditions, but differences in condition.

Bourdieu has been criticized for not investigating the possibilities of

resistance to the logic of distinction. Critics claim he does not take into account

working class strategies and the possibility that academic institutions may also have

within the seeds of contradiction, that they may change social relations, rather than

reproduce them. He has been accused of being too functionalistic, not accounting

for human agency. For instance, he does not explain how habitus can change. As

well, critics say the exact nature of the relative autonomy of the schools needs

clarification. Bourdieu has also been criticized for lacking an empirical basis for

some of his concepts.

Social Reproduction Studies. A number of researchers have used Bourdieu's

ideas about the role of the education system in the reproduction of class relations.

For example, Valadez (1993) studied the institutional arrangements in a U.S.

community college that reproduced the social inequities found in the social structure.

Valadez (1996) illuminated the impact of cultural capital levels on the experiences of

students in a community college. Rinne & Kivinen (1993) attempted to discover who

is using or not using the adult education system in Finland. They hoped to

determine whether this "second chance" system actually acts as an opportunity for a

second beginning for those deprived of social status through inadequate education

and training. As well, they hoped to discover if it serves the already advantaged,

reproducing the social inequities already present in Finland. They concluded that

disadvantaged social groups make up only a small fraction of the users of the adult

education system. David Corson (1993) used Bourdieu=s work to show the role

language and cultural capital have in regards to the negative educational

experiences of minorities and girls in the traditional education system. Persell,

Catsambis, and Cookson (1992) showed how gendered pathways in education are

related to social class relations and the reproduction of the relations between the

genders. As will be described in detail in the next section, Persell and Cookson

(1987) showed why elite boarding schools adopt educational innovations, like the

computer. Their work illuminates the role of schools in the adoption of educational

innovations and in the reproduction of the social and economic status quo.

Bourdieu's work is important in that it demonstrates the complexity of the

social reproduction process. His theories provide a framework for understanding the

relationship between the education system and the workings of the social structure.

As such, Bourdieu's concepts of cultural capital, class ethos, and class habitus are

applicable to investigating socio-economic barriers to accessing CMC and the

implications of increasing use of this mode of delivery. The problem is placed in the

larger picture.

A New Form of Cultural Capital

Computer access and "know how" and comfort with new technologies may be

accumulated through the family, the workplace, and the education system. The

ability and motivation to appropriate it is related to one's class ethos and habitus.

However, it is no longer an elite form of cultural capital. Those students possessing

this cultural capital will have more of a choice when presented with the option of

taking distance education classes by CMC or correspondence. They are familiar with computers, have more confidence in adopting new technology, less anxiety about trying CMC, and they perceive the rewards these skills make possible.

As mentioned earlier, Persell and Cookson (1987) have investigated the adoption of microcomputers as an educational innovation in elite boarding schools. Their investigation was based on Bourdieu's theory of social reproduction which suggests that the inevitability of change requires that elites adopt and channel innovation to retain control over emerging forms of knowledge. They argued that one of the key intellectual resources of the present is the computer, a tool that allows users to create new knowledge and control existing knowledge. Persell and Cookson examined how 48 private secondary boarding schools and their students responded to the emergence of microcomputers.

Persell and Cookson (1987) distinguish between two forms of cultural capital acquisition pertaining to their study: symbolic and instrumental. Symbolic acquisition suggests possession of cultural capital without necessarily implying its use. Instrumental acquisition, on the other hand, involves the use of new cultural capital goods (p. 124).

The schools are in a competitive market. They are expected to offer the best education available. One of their marketing strategies is to develop impressive computer centres. Persell and Cookson (1987) suggest that the facilities act as indicators of symbolic acquisition of cultural capital. The formation of a computer science department is another. "By adopting this new cultural capital and displaying it in highly visible ways, these boarding schools can claim that they offer computer

literacy" (p. 126). And, by their actions, these schools, at least some for the families sending their children there, are defining this new knowledge and equipment as important and worthy of ownership (p. 126).

What is surprising from a purely instrumental perspective, but not from a symbolic perspective, is how infrequently most students use computers. "If this new form of cultural capital was seen as primarily instrumental, nearly everyone would be using computers frequently" (Persell & Cookson, 1987, p. 126). The relatively low rates of use are consistent with Bourdieu's view that, in some cases, the possession of cultural capital is more important than the use of such capital (p. 127).

The results of the study show that indeed elite schools were concerned with offering both symbolic and instrumental forms of cultural capital concerning computers. As early as 1982, over half the schools had already established extensive computer centres and departments. The larger, better endowed schools were more likely to have computer centres, and boys' schools and co-ed schools were more likely than girls' schools to have them (Persell & Cookson, 1987, p. 126). "Only 25% of girls' schools had computer facilities, compared to 60% of boys' schools and 55% of co-ed schools, and this may reflect differential computer usage" (p. 130).

Most of the variance in frequency of microcomputer use was explained by the existence of a computer centre in the school. However, two other factors -- expected college major and ownership of a home computer -- were also related (p. Persell & Cookson, 1987, 127). The existence of a computer facility at their school was significantly related to frequency of use for whites and Asians, but not for Blacks.

Being male correlated to the frequency of use among white and Asian students --
although it was statistically significant only among whites. Among whites, boys are
more likely to use microcomputers than girls (p. 127). Persell and Cookson suggest
that for white and Asian girls attending elite boarding schools, computer competency
is probably not as much a requirement for their social and academic futures. Upper
class women's social and political labour does not depend on the mastery of
computers (p. 130). As such, this form of cultural capital cannot be converted for
women as in the same manner as it can for men, so it is not a vital class
reproduction strategy among these girls (p. 130). Some students seemed more
interested in computer use than others and this may be related to parental influence.
Those students whose families owned computers were somewhat more likely to use
them frequently at school and were less likely to never use them than students
whose families did not own computers (p. 129).

Persell and Cookson's (1987) conclusions about computer cultural capital
follow from Bourdieu. The continuity of class position implies the willingness of class
members and their agents to adapt to innovation as part of their strategy of
reproduction:

> This is consistent with boarding schools' adoption of a new form of cultural
> capital; it appears that organizational concerns propel certain elite schools to
> adopt new forms of cultural capital as they want to stay competitive; as such,
> they become active constructors of dominant ideologies and knowledge,
> putting symbolic and instrumental capital in the hands of existing and future
> elites; hence, reproduction of class relations and class positions is not an
> automatic outcome of a well-functioning system, it depends to some degree
> upon strategic decisions made by key educational personnel. (Connell et al.,
> 1981, in Persell and Cookson, 1987, p. 130-131)

Schools may be relatively autonomous, but their functioning is related to social class relations.

The acquisition of computer skills and computer literacy as a new form of cultural capital depends on, as with other forms of capital, the existence of capital already. There are unequal conditions in the social structure for accumulating cultural capital. The division between groups with it and those without it will be greater when new forms such as computer skills become part of the hidden transmission of privilege. Harvey (1986-87) and Persell and Cookson (1987) show the importance of having computer skills in the information age, and they show the social processes at work that make them cultural capital. As cultural capital, computer skills translate into economic and academic capital, which convert into greater opportunity for economic and social gains.

The notion of reproduction stands as a healthy reminder that changes, whether in the form of social mobility or educational reform and innovations, may indeed be compatible with a profound and enduring stability (Swartz, 1977, p. 554). The distance education system, in using high technology to pursue the "virtual classroom," may create more barriers to equal education for people with less cultural capital. It may further benefit those who have the "traditional" forms of cultural capital as well as computer literacy. As such, the inequities experienced by certain social groups will be reproduced because they lack cultural capital and the income to access a more effective and prestigious method of studying by distance education.

The game is always changing. What is valued today, may not be tomorrow.

Frequently the actions whereby each class (or class fraction) works to win new

advantages, are countered by the reactions of the other classes, directed toward the

same objective (Bourdieu, 1984, p. 157). The prestige associated with using

information technology, like "surfing the Net," is a case in point. Where once seen

as prestigious, now it is more like "a fact of life" for the middle class. It no longer has

the same scarcity value. CMC has advanced the status of distance education

because of its use of new information technology, making it less of a "poor cousin."

If CMC is adopted by the majority of distance education students it may become

less prestigious.

> According to Bourdieu (1984),
>
> The dialectic of down classing and up classing, which underlies a whole set
> of social processes, presupposes and entails all the groups concerned to run
> in the same direction, toward the same objectives, and the same properties;
> those which are designated by the leading group and which, by definition, are
> unavailable to the groups following. Since, whatever these properties may be
> intrinsically, they are modified and qualified by their distinct rarity and will no
> longer be what they are once they multiply and are made available to groups
> lower down. (p. 163).

Devaluation of academic qualifications or any educational practice occurs when it

becomes too available, or too easy to access. One could argue that this is the basis

for the perception of correspondence learning as "second class" in the first place. It

is not an issue of quality of teaching method, but of distinction, an arbitrary

judgement that is a function of the competition for scarce goods -- the logic of

capital.

<u>Chapter Summary</u>

The focus of this chapter has been a review of the literature that pertains to students' perceptions of CMC, their access to the means to participate in it, and the socio-economic barriers they may face. Additionally, the work of Bourdieu (1977, 1984, 1986) and Persell and Cookson (1987) was reviewed to establish a theoretical context for understanding at a deeper level why some students are more able to choose to participate in CMC than others. The review of the literature suggests that there are barriers to participating in CMC for some students. However, as the empirical evidence about the potential barriers is contradictory, it is difficult to know the extent of the problems students face in participating in CMC. It is possible that the research on perceptions, barriers, and technological adoption provide contradictory evidence because the studies only touch the surface of the social processes at work in the relationships between technology, education, and social inequities. Bourdieu's educational sociology invites a deeper view of these relationships and the impact of using CMC in distance education.

Some conclusions can be drawn from the existing literature. It appears that one of the main reasons students enrol in CMC courses is an interest in electronic communication and computer technology. These students may be an innovative vanguard, the "early adopters," or even the "early majority" in a diffusion curve, one explanation of student adoption patterns for CMC. Positive attitudes towards the impact of information technology on society, computers in general, and previous experience with computer technology may be reasons for CMC enrolment.

The existing research also suggests that economic barriers to accessing CMC exist: the cost of purchasing or leasing the necessary equipment, and long

distance charges. A higher income level may be a predictor of choosing CMC. Distance education institutions have generally decided to leave the responsibility for access to the required computer technology to the student. So, to participate in CMC courses, one must have convenient and quality access to computer and modem equipment of sufficient capabilities. It is difficult to estimate from the literature the extent of computer access problems. Modem access appears to be the major barrier in terms of equipment.

Groups who are culturally and educationally disadvantaged are often the economically disadvantaged. The demographic research suggests that most CMC students are employed full-time. Women, due to socialization, gendered educational pathways, more family responsibilities, and less income may experience more barriers in accessing CMC. Rural students may be at a disadvantage because of the extra long distance costs and in that they may have less access to computer literacy training. Age and education level together and education itself are potential barriers to CMC participation. Older students, who often have less education -- especially related to computers -- may not enrol in CMC as often as younger, better educated students. Native Canadians have lower education and income levels than the average Canadian and have been culturally stigmatized. Some other immigrant groups experiencing the same disadvantages may also face similar economic and access barriers to participating in CMC.

The research also suggests that lack of motivation and computer literacy may be barriers for disadvantaged social groups. The rewards for acquiring the skills to access CMC may not be perceived to balance the costs and time required. As well,

90

the technology may simply be irrelevant to their experience of the world.

Experience and comfort with computers and modems, and computer literacy may be a new form of cultural capital that some groups can accumulate more readily and with greater benefit. Bourdieu's theory of social reproduction suggests that it is the unequal accumulation of cultural capital that reproduces social inequities. If CMC requires a higher level of cultural capital than traditional forms of distance education delivery then social groups with less cultural capital -- old and new forms -- will be more disadvantaged in accessing it. CMC may not be the democratic medium it is often referred to as because it has technological and skill requirements.

A primary issue for consideration in implementing CMC courses at the undergraduate level, and especially in the case of prerequisite classes, is: who will benefit, and who will not? The development of distance education was a response to the needs of students who were unable to attend traditional institutions. Its purpose, historically, was to give educational opportunity to those who needed it. CMC may be pedagogically superior to homestudy in that it is interactive, but should the resources of publicly funded distance education institutions be directed towards expanding the use of a mode of delivery that is still questionable in terms of access for disadvantaged groups and individuals?

"It is clear that those individuals served by the school are those of the dominant class, ironically as Bourdieu explains, those who need it least" (Gorder, 1980, p. 342). It is because of this possibility that distance educators should determine who is studying by CMC, who is not, and why. This kind of research is

91

necessary before directing resources to increase the extent of CMC use and developing other methods of delivery that require even more sophisticated technology and skills. The very nature of the medium that delivers course content can be a reproductive mechanism, as may be the case in CMC, especially given the increasingly market driven nature of higher education and the growth of the on-line education market.

To conclude, describing the reasons and predictors for CMC enrolment and the access barriers to participating in CMC will not suffice to determine why some students choose CMC or the social impact of the use of CMC in distance education. To meet those objectives an explanatory framework that can illuminate the deeper socio-cultural processes that influence the choices students make in enroling or not enroling in CMC, such as cultural capital, is necessary.

CHAPTER III

Methodology

Purpose of the Chapter

Chapter Three describes the participants, instruments, design, procedures, and tools of analysis of the study.

Synopsis of the Study

The purpose of the study was to discover the reasons students chose or do not choose to study by CMC and to explicate and apply the concept of cultural capital as described by Persell and Cookson (1987) and derived from Bourdieu (1986) in order to explore the relationship between cultural capital and choice of delivery mode. The study used the survey method, and the survey was conducted by telephone interview.

Background of the Study

The ideas that form the basis of the study came from the researcher's experiences while working in education in northern Saskatchewan and from her work in the AU Master of Distance Education (MDE) program. After working and living in the North, observations made in what were once theoretical discussions about equality of opportunity and condition in Canada became stark realities. The success of the distance education program she worked with in overcoming some of the educational disadvantages of the northern people, encouraged her to work on a

93

graduate degree in distance education.

Though very pleased with the opportunity the AU MDE program offered her, she also questioned the accessibility of the program to the people around her. The self-confidence needed to take on new computer skills, the academic skills and background required, the costs, and CMC technology involved, on top of taking a graduate degree at a distance, potentially put the program out of reach for many of them.

The issue of equality in educational opportunity and condition, never far from the researcher's mind, was illuminated by her reading a brief description of Bourdieu=s theory of social reproduction in a sociology text. The concept of cultural capital immediately had resonance, and she began to read Bourdieu's work. Bourdieu's theoretical and empirical work in the field of educational sociology, the lack of empirical research on the accessibility of CMC to disadvantaged groups, and the belief that distance education should be a part of the solution to educational disadvantage were the ideas that led to the conception of the study.

After consulting with her program advisor, doing an extensive amount of research, and sketching out the research questions, study design, and methodology, the researcher developed a draft of the thesis proposal. The proposal was finalized in consultation with her advisor, who had agreed to be the thesis supervisor, and then a thesis committee was struck. Though already writing the body of the thesis, the researcher followed the AU thesis workshop in order to learn more about the thesis requirements.

<u>Participants</u>

The first step in the process of obtaining the sample was to apply to the Athabasca University Ethics Committee for permission to study AU students. Once permission to study AU students was obtained, Accounting 253 student registration data was acquired to begin sampling procedures.

Initially, the target population was to be all active Accounting 253 students registered in the period from April 1, 1996, to September 30, 1997. April 1996 was the first month for the ViTAL section intake. At first, the goal was to random sample both the homestudy and ViTAL sections to produce a sample with an equal number of active students from each section. Additionally, it was desired that each of the sub-samples be representative of the gender ratio at AU, in case gender acted as a hidden variable (see Table 1). Gender was determined, through the review of the literature, to be a possible barrier to choosing CMC. If necessary, a stratification procedure before random sampling would be performed. The reason for stratification and random sampling was the desire for a representative sample of AU's population for the purpose of generalizability.

Table 1

<u>Desired Sample Population</u>

Participants' Status and Mode	Gender		
	Male	Female	Total

Active ViTAL	16 (32%)	34 (68%)	50 (50%)
Active Homestudy	16 (32%)	34 (68%)	50 (50%)
Total	32 (32%)	68 (68%)	100 (100%)

However, this ideal was not met. Very notably, the active ViTAL group was too small to randomly sample. Since April 1996, only 66 students had registered in ViTAL, while 847 students had enroled in homestudy. The initial decision to only survey active students was made in the belief that the factors involved in the decision to register in one mode or the other would be clearer in these students' minds. But, because the ViTAL population was so small, it was decided that an enumeration of the active ViTAL students was necessary, and that a stratified random sample of the Homestudy students would be matched to that to produce a paired final sample.

Even then, it was found that an enumeration of the active ViTAL students would still be too small a sample to perform some parametric statistical procedures. So, an enumeration of the active and complete students, excluding those who had failed, did not complete, or had withdrawn from the course, was deemed necessary. The students who did not complete, withdrew, or failed the course were excluded from the list of potential participants because of the possibility of negative reactions as a result of the students' feelings of failure. These feelings may have biased the students' attitudes towards the mode of delivery and interfered with their remembering and articulating the reasons they chose it in the first place. Of

foremost concern were the students= reasons for choosing a mode in the first place, not their response to the mode itself. Finally, these students are often much harder to induce to participate in research as well.

So, after eliminating the withdrawals and failures, a list of 37 students who were active in or had completed Accounting 253 by the ViTAL delivery mode from April 1, 1996, to September 30, 1997, was obtained. This group would be enumerated. The ViTAL sub-sample consisted of 22 (59%) active students and 15 (41%) completed students. Twenty-six (70%) were women and 11 (30%) were men. Significantly, the gender ratio was roughly representative of AU's student population as a whole (67% women and 33% men), so stratification was not necessary.

After eliminating the withdrawals, incompletes, and failures from the 847 students registered from April 1996 to September 1997, there were 555 active and complete students to work with. Of those, 69% were female and 31% male. This eliminated the need to stratify this sub-sample according to gender as well, as it was determined to be a rough match to the ViTAL sample and roughly representative of AU's general student body. However, 63% of the 555 were active and 37% were complete. The Homestudy group was random sampled to choose 37 students from the 555 potential participants. To random sample and stratify the Homestudy group, every 15th name was picked until 15 completed students or 22 active students were chosen, which ever came first. Then, the 16th was picked if the 15th was the wrong status. Since the percentages of the two groups were not very different, little trouble was encountered in obtaining the paired sample.

The final sampling population consisted of 74 potential participants. The

paired sample was made up of 37 students from both the ViTAL and homestudy

sections (see Table 2).

Table 2

<u>Actual Sample Population</u>

Participants' Status and Mode	Gender		
	Male	Female	Total
ViTAL			
Active	5 (23%)	17 (77%)	22 (60%)
Complete	6 (40%)	9 (60%)	15 (41%)
Subtotal	11 (48%)	26 (51%)	37 (50%)
Homestudy			
Active	6 (28%)	16 (72%)	22 (60%)
Complete	6 (40%)	9 (60%)	15 (40%)
Subtotal	12 (52%)	25 (49%)	37 (50%)
Total	23 (100%)	51 (100%)	74 (100%)

Out of the sample of 74 potential survey respondents and the list of five

Homestudy back-ups, 58 agreed to participate in the interview. A total of 21 were

not surveyed. Of the students that were not surveyed, three refused to participate,

four were out of the country, ten had moved or had their phones disconnected, and

the last four were unable to be reached by telephone after repeated attempts. The

response rate for the survey was 73%.

The final sample of participants that was obtained through the enactment of

the data collection procedures was roughly what was desired. Table 3 depicts the

active/complete status, mode of delivery, and gender ratios of the final sample used

in the study:

Table 3

Final Sample

Participant's Status and Mode	Gender		
	Male	Female	Total
ViTAL			
Active	5 (71%)	13 (69%)	18 (62%)
Complete	2 (29%)	9 (31%)	11 (38%)
Subtotal	7 (47%)	22 (51%)	29 (50%)
Homestudy			
Active	5 (63%)	12 (57%)	17 (59%)
Complete	3 (37%)	9 (43%)	12 (41%)
Subtotal	8 (53%)	21 (49%)	29 (50%)
Total	15 (100%)	43 (100%)	58 (100%)

Instrument

The method of research used was the survey:

A research technique where information requirements are specified, a population is identified, a sample selected and systematically questioned, and the results analyzed, generalized to the population, and reported to meet information needs. (Alreck & Settle, 1985, p. 421)

The survey instrument was developed using ideas and information from survey research resource books (Alreck & Settle, 1995; Rossi, Wright, & Anderson, 1983), similar types of empirical studies (Conway, 1991; Rekkedal, 1990; Richards et al., 1995), and the literature reviewed. As the research was exploratory and inductive in nature, the survey covered a wide range of topics: the inducements and barriers

involved in choosing CMC or homestudy, access to and use of computer technology, student demographic and socio-economic characteristics, and familial socio-economic background (see Appendix A for survey instrument).

The instrument was made up of structured questions because of the large amount of information to be collected and processed. For the majority of the questions, all possible answers were listed along with several "other" spaces in case some responses did not fit. The pre-coded responses on the survey paper allowed the interviewer to go through the questions more quickly, as very little writing was involved. The participants' responses, in most cases, could simply be checked off. Additionally, some questions were constructed to employ scales, so as to elicit opinions and perceptions in a timely way.

The possible responses for the questions about inducements and barriers to registering were drawn from the literature reviewed and the general knowledge base the researcher had developed in her practice of distance education and through the AU MDE program. The questions dealing with access to, use of, and experience and comfort with computers were based on an AU study performed by Conway (1991). The demographic questions used were standard, for the most part. Income categories were developed according to examples from Alreck and Settle (1985), and the reviewed demographic literature. Most of these questions were pre-coded. Age and number of children were not initially categorized.

The family background questions were derived from the review of the literature and empirical studies based on Bourdieu's (1986) concept of cultural capital. The participant's occupation, and their mother and father's occupations were

recorded verbatim. These data were coded after collection, and before processing.

Design

The survey method employed was the telephone interview. This method was chosen in order to meet the following objectives of the study:

<   To overcome geographical distance in a cost effective manner. In-person interviews were financially impossible;

<   To establish such a level of rapport with students as to elicit quality responses, as some questions were of a personal nature;

<   To have as many of the students in the sample participate as possible (as mail surveys typically have low response rates).

(Rekkedal [1990] performed a similar telephone survey in addressing a similar research topic, and the telephone survey is an established method at AU [Conway, 1991; Student Satisfaction Survey, 1997]).

To answer the questions of the research study, a comparison of the students in correspondence/homestudy, a print-based method of distance education delivery, and CMC/ViTAL, a new method of delivery which uses computer communications technology, was necessary (see definitions in Chapter One). By consulting the AU calendar, various AU staff members, and the Accounting 253 course instructor, it was determined that AU's Accounting 253 was an appropriate course to use in the study. Both homestudy and ViTAL were used to deliver the course. Therefore, in studying Accounting 253 students, two self-selected groups (see definitions in Chapter One) in the same course could be compared. This prevented the course of

study being a hidden variable in the comparison.

Accounting 253 was also an appropriate choice as it is an introductory undergraduate course and a prerequisite for an Administration degree. Access for new distance education students to CMC participation in these entry level courses is of great concern. Additionally, accounting is becoming a highly computerized field, and thus issues involving computer technology loom larger.

<div align="center">Procedures</div>

The survey instrument was piloted by three students known to the researcher, two of whom had experience with distance education. As a result of the pilot process, the instrument was honed. The wording of the questions was edited for clarity, and it was concluded that the survey could be performed in less than 15 minutes.

Following the pilot of the survey, a letter was mailed to all the potential participants, introducing the researcher and the nature of the study they were being asked to participate in. This advance notice of the telephone survey assured the potential participants that their participation was voluntary, and that there were no risks in participating (see Appendix B). Seventy-nine letters of introduction were mailed out, which included the five students who were randomly chosen as backups for pairing the sample.

This procedure proved valuable to the validity of the study design for a number of reasons. Some students had moved. Those that were in the ViTAL section were e-mailed a copy of the letter of introduction and were asked to supply a

phone number they could be contacted at if they decided to participate in the survey. The Homestudy students who had moved became non-responses as their telephone numbers had also been disconnected. Two weeks were allowed for the letters to be received.

Also as a result of the letter, when the researcher telephoned the potential participants, she was able to introduce herself and the study without going into great detail. Most students immediately recognized the researcher's name and understood the reason she was calling.

If a student had already completed Accounting 253, they were asked to respond to the survey questions as they would have when they had just registered for the course. The reason for this was that the survey was designed, because of the nature of the research questions, to collect information about students as they entered the course, i.e. measuring computer skills and access to equipment.

Data Collection

It was initially thought that each potential participant would be called a maximum of three times. However, this procedure was soon found to be inadequate if the sample was to be large enough. It was very important to have a sample close to 30 in the ViTAL group for obtaining valid data. As there was no way to enlarge the sample, other than by including the withdrawals, incompletes, and failures, the researcher simply called until she was able to speak to the student and ask him/her to participate. The same procedure was used with the Homestudy students, though five students on the back-up list could be called in an effort to match the ViTAL sub-sample number. This list was used, and in doing so a paired sample was obtained.

The interview protocol appears in the survey instrument, and as such can be found in Appendix A. Students were reminded that their participation was completely voluntary, that they could refuse to answer any question and terminate the interview at any time. It is important to note that students were not prompted with the pre-coded responses, but responded freely to the questions. They often gave multiple responses, depending on the nature of the question, all of which were recorded and not ranked. The interviewer coded the responses according to her own interpretation of their fit to the pre-coded responses. There were two questions about the frequency of computer and modem use that were the exception.

As the researcher/interviewer became more familiar with the protocol and survey itself, the interviews went faster than anticipated and than had been indicated in the pilot process. This was because the researcher came to know the instrument better, and she became more proficient at interpreting and coding the free response answers. Some students did wonder about some of the more personal demographic and family background questions. Some questioned the relevance of the background questions, so the research questions of the study were explained.

<u>Data Processing</u>

As most of the questions were pre-coded, the majority of the data processing simply involved entering the data from the surveys into a spreadsheet. The spreadsheet consisted of columns which represented the variables -- all the possible answers or a field in which a numerical value like age or number of children could be entered -- and rows which represented the participants or cases. Questions that

participants refused to answer were noted, and will be discussed in Chapter Four.

The only survey information that initially needed to be post-coded was the participant's and his/her mother=s and father=s occupational statuses. Occupational status categories were determined using the schema adopted by the 1986 General Social Survey of Canada (Cresse, Guppy, & Meissner, 1991). This schema has five classes or categories of occupational status and is hierarchically organized to represent the authority, education, and income level and Blishen score of each of the occupational classifications. It is derived from the Blishen index of socio-economic status and the Pineo-Porter-McRoberts occupational scale. It was chosen as a way of rating the occupational status of the participants because it takes into account recent changes in the Canadian labour force and the nature of sex segregation in occupations (Cresse et al., 1991).

If there was some question as to the classification the occupation fit into, as the categories are somewhat broad, the revised Blishen Index scores (Blishen & McRoberts, 1976), the participant's declared income, and his/her education level were referred to in order to make a decision.

Data Analysis

The study principally addressed three research questions as described in Chapter One. The data analysis was based on these three questions.

Major Research Question #1: What inducements and barriers do students give as reasons for their choice of delivery mode?

To address this question students were asked to articulate their perceptions of the advantages and inducements, disadvantages and barriers of the two modes in terms of their personal reasons for enroling in either one, and why they may not have chosen the other option. This included asking them about their perceptions of the status or prestige of the two modes, and the impact that perceived prestige level had on their decision to enrol in either one. The questions from the survey that provided data to answer this question were:

ViTAL Students Only

#5   What are the major advantages of ViTAL that you would list as your reasons for registering in the ViTAL section of Accounting 253?

#5a   What were the barriers or disadvantages associated with ViTAL, if any, that you had to overcome to be able to register in the ViTAL option?

#5b   What were your reasons, if any, for NOT registering in the homestudy option?

Homestudy Students Only

#6   What are the major advantages of homestudy that you would list as your reasons for registering in the homestudy section of Accounting 253?

#6a   What were the barriers or disadvantages associated with homestudy, if any, that you had to overcome to be able to register in the homestudy section of Accounting 253?

#6b   What were your reasons, if any, for NOT registering in the ViTAL/ CMC option?

Both Groups

#7   How would you rate the prestige level of homestudy/ correspondence courses in general?

#8   How would you rate the prestige level of ViTAL/ CMC courses?

#9   How important a factor was the prestige level of homestudy or ViTAL in your decision to register in either one?

Major Research Question #2: How do the two self-selected groups compare with each other in terms of demographic variables and selected variables related in theory and practice to the adoption of computer communications technology?

The data required to answer this question were the students' distance education experience, whether they knew about the choice to study by the two different modes, and standard demographics. The questions from the survey which provided the data to answer this question were:

#1   Had you taken a university course for credit by distance education before registering in Accounting 253?

#1a   If yes, how was it delivered?

#4   Did you know that you had a choice to take Accounting 253 by ViTAL or by homestudy?

#12   Do you have a computer at home?

#12b   If no, do you have convenient access to a computer anywhere else?

#15   Do you have a modem at home?

#15b   If no, do you have convenient access to a modem anywhere else?

#19   What is your gender?

#20   Do you live in a community with a population of 2500 or less?

#22   What is your age?

#23   What is your highest educational attainment?

#24   What is your martial status?

#25   How many children do you have living at home?

#26   What is you ethnic background?

#27   What is or was your normal occupation?

#28   Are you currently employed in your normal occupation?

#29   Are you working full-time, part-time, or not at all?

#30   What is your typical annual income in Canadian dollars?

Major Research Question #3: To what extent does cultural capital mediate the relationship between socio-economic status, socio-economic background, and choice of delivery mode?

This question addresses the relationship between socio-economic status and choice of delivery mode. It incorporates the idea that the possession of a computer and modem, computer literacy, and experience and comfort with using computers and modems are new forms of cultural capital. Symbolic cultural capital is the possession of the computer technology, and instrumental cultural capital is the ability to use the technology (Persell & Cookson, 1987). These new forms of cultural capital may act as a mediating factor (beyond older forms of cultural capital which have been associated with coming from a higher socio-economic background) in the relationship between socio-economic status and choice of delivery mode. As such,

the data required to answer this question are the participants' socio-economic background and the extent to which they possess the new forms of cultural capital. The survey questions which provide the data for this question are:

#10   How experienced would you say you are with computers?

#11   Where did you get any experience you have with computers from?

#12   Do you have a computer at home?

#12a If yes, what kind of computer is it?

#12b If no, do you have convenient access to a computer anywhere else?

#13   How comfortable do you feel generally about using computers?

#14   How frequently do you use a computer?

#15   Do you have a modem at home?

#15a If yes, what kind of modem do you have?

#15b If no, do you have convenient access to a modem anywhere else?

#16   How experienced would you say you are with modems?

#17   Where did you get any experience you have with modems from?

#18   How frequently do you use a modem?

#32   What is or was your mother's occupation?

#33   What is or was your mother's typical annual income in Canadian dollars?

#34   What is or was you mother's highest educational attainment?

#35   What is or was your father's occupation?

#36   What is or was your father's typical annual income in Canadian dollars?

#37   What is or was your father's highest educational attainment?

The data gathered from the following questions were not analyzed. The questions were either included as a way of confirming other question responses, or, following data collection, they were deemed to be outside the focus of the study.

#2   What month and year did you register in Accounting 253?

#4a   How did you find out that you had a choice (to study by ViTAL or by homestudy)?

#21   For the majority of your high school years, did you reside in a community with a population of 2500 or less?

#31   What is the typical annual income of your household in Canadian dollars?

See Appendix A for the survey instrument in its entirety.

Statistical Tools of Analysis

The data were analyzed using common descriptive procedures and non-parametric tests. Median values, rather than means, were used to determine the central tendency when the n values were small. Because of the size of the sample involved and with regard to being conservative about the meaning of the results, non-parametric treatments were applied to the data.

The Chi-square Test of Independence was used to accept or reject the null hypothesis of the independence of two variables. The observed significance level used to reject the hypothesis of independence in this study was $p < .05$. Because of the small sample size and the many cases where the expected values were small, the Yates' correction for continuity and Fisher's exact tests were most appropriate.

Measure of association statistics were used to examine the strength and

nature of the dependence of the variables. To measure the strength of association between nominal variables, the PRE (Proportional Reduction in Error) statistic, Goodman and Kruskal's Lambda was used. The predictive value of variables was determined. For ordinal variables, correlation measures were used, using the observed significance level of $p < .01$, as noted in Chapter Four. For examining associations involving a dependent variable measured on an interval scale and where the independent variable was measured on a nominal or ordinal scale, the *eta* co-efficient was used.

To compare means, ANOVAs were used. The observed significance level used to reject the hypothesis that the means of the population were equal in these tests was $p < .05$. An ANOVA was used to test the variance in a populations' means when the dependent variable was measured on an interval or ratio scale and the independent variable was measured on a nominal or ordinal scale.

It is important to note that in some cases, for descriptive purposes, associations were reported that were greater than the chosen observed significance level of $p < .05$. These cases were specifically noted in Chapter Four.

<u>Chapter Summary</u>

The chosen method of research was that of the telephone survey. The telephone survey was an appropriate method for comparing the two groups of interest in the study because it met the cost, data type, rapport, and participation requirements.

The design of the study followed from the need to compare two groups of

students, Homestudy and ViTAL. AU's Accounting 253 course was chosen for its fit with this purpose. The sampling procedures and sample composition also followed from this need.

The design of the survey instrument was based on the need for structured questions because of the large amount of data required. The data collection procedures were based on the desire for maximum participation and a consistent method.

The data processing was minimal initially, as the questions were structured and, for the most part, pre-coded. The survey responses were entered into a spreadsheet. The occupational status post-coding was dealt with by using an accepted occupational status classification scheme. Post-coding for statistical analysis was done according to the purposes of the study.

The data analysis was based on addressing the three major research questions. Related survey questions drew out the data required to answer them, and this data was subjected to non-parametric treatments.

Results

Review of the Statement of Purpose

The purpose of this study is to discover the reasons students choose or do not choose to study by CMC. The study addresses inducements for and barriers to studying by CMC, those that students articulate and those that may be related to the extent to which they possess cultural capital. To do so, the study uses conceptual tools derived from Bourdieu (1977, 1984, 1986) and through Persell and Cookson (1987) to investigate the relationships between students' socio-economic characteristics and background, access to computer technology, computer comfort and literacy levels, and their choice of delivery mode.

Purpose of the Chapter

The purpose of this chapter is to analyze the data collected by the survey. The data will be analyzed in order to identify the inducements for and barriers to registering in CMC/ViTAL, to establish a demographic profile of the CMC/ViTAL student compared to that of the Homestudy student, and to apply the construct of cultural capital after identifying and testing proxies from the socio-economic, computer, and family background data in order to compare the cultural capital levels of the two self-selected groups. Interpretation and discussion of the results is reserved for Chapter Five.

Organization of the Chapter

In the first section, the data analyzed are the reasons, or the inducements and barriers, which the students articulated for choosing or not choosing one mode or the other. The focus is a comparison of the Homestudy and ViTAL students' responses to discover the inducements for and barriers to choosing CMC and to explore whether the two groups= responses differ in nature. In addition, the data on the perceived prestige of the two modes will be analyzed to establish whether mode of delivery prestige levels impact on choice of mode. The above analyses address the first research question of the study: What inducements and barriers do students give as their reasons for their choice of delivery mode?

The second section will analyze demographic data to develop and compare the demographic profiles of the average ViTAL and Homestudy student. The purpose is to discover who studies by CMC and who studies by homestudy in order to draw out demographic predictors for choosing CMC. In addition, the two groups' distance education experience will be compared as it has been found in previous studies to be a predictor of choosing CMC. Access to computer and modem equipment will also be analyzed as lack of access to CMC equipment is a barrier to choosing CMC. These analyses address the second major research question of the study: How do the two self-selected groups compare with each other in terms of demographic variables and selected variables related in theory and practice to the adoption of computer communications technology?

In the third section, socio-economic, computer, and family background data will be analyzed. The study's construct of cultural capital will be applied in the analysis to investigate possible relationships between the students' socio-economic status

114

and background, the extent to which they possess cultural capital, and their choice of delivery mode.

Selected key variables and two key groups of variables will be used in the analysis of the relationship between socio-economic status, familial socio-economic background, cultural capital, and choice of delivery mode. The phrase "key variables" refers to the students' socio-economic status and the key variables are as follows: Gender, Geographical Location, Age, Education Level, Income Level, Occupational Status, and Visible Minority Status.

The key group of variables "Background Variables" refers to the students' familial socio-economic backgrounds. The variables in this group are: Mother's Education Level, Occupational Status, and Income Level, and Father's Education Level, Occupational Status, and Income Level.

The key group of variables "Cultural Capital Variables" refers to the students' computer technology ownership and computer literacy and use levels. The variables in this group are: Computer at Home, Modem at Home, Computer Experience, Modem Experience, Frequency of Computer Use, Frequency of Modem Use, and Computer Comfort.

The analyses in the third section of the chapter address the third research question: To what extent does cultural capital mediate the relationship between socio-economic status, socio-economic background, and choice of delivery mode? The data that was analyzed in the study was collected by the survey instrument, which can be found in Appendix A.

Perceptions: Inducements and Barriers

In this first section, the results of the investigation into students= perceptions of the inducements and barriers to the use of electronic means for learning are presented.

Inducements. The main inducements for the ViTAL students to study by ViTAL were: faster communication, learning CMC skills, and increased interaction with the instructor. These three responses accounted for nearly 50% of responses (see Table C1, Appendix C).

In contrast, Homestudy students most often gave the convenience and flexibility of homestudy as the inducements for studying by homestudy. In total, as shown in Table C2, Appendix C, the ability to work anywhere and the pressure of their personal circumstances accounted for over half of the responses.

Of interest also was whether the perceived prestige level of the two modes differed, and whether prestige level acted as an inducement. As shown in Table 4, Homestudy students rated the prestige of homestudy significantly higher than the ViTAL students did. Homestudy students also rated ViTAL higher in prestige than did the ViTAL students themselves.

Of note is the fact that 66% of Homestudy students did not feel qualified to give a rating of the prestige of ViTAL. They were unfamiliar with CMC or ViTAL, and/or they did not know anyone who had taken a course by that mode of delivery.

Table 4

Ratings of the Prestige Level of Homestudy and ViTAL According to Mode of Delivery

		Prestige Ratings			
		M	Mdn	SD	n
Group	Mode of delivery				
ViTAL	ViTAL	6.4	7.0	1.87	27
	Homestudy*	5.3	5.0	1.89	29
Homestudy	ViTAL	7.1	7.5	1.85	10
	Homestudy*	6.5	7.0	1.70	27
Entire Population	ViTAL	6.6	7.0	1.86	37
	Homestudy	5.9	6.0	1.80	56

Note. The prestige ratings of the modes of delivery were made on a scale from one to ten where one meant very low and ten meant very high. The two missing values are due to the students' expressed inability to give a rating.
ANOVA. * p < .05.

When the prestige ratings were separated into three groups (low [1-3], middle [4-6], and high [7-10] ratings) the findings were as follows: ViTAL students were more likely than Homestudy students to rate homestudy as low in prestige, and were less likely than Homestudy students to rate homestudy in the high category. Homestudy students, on the other hand, were more likely to rate the prestige of ViTAL in the high category than were the ViTAL students themselves (see Tables C3 and C4 in Appendix C).

Most of the students in both the ViTAL and Homestudy groups rated the importance of the prestige level of ViTAL and homestudy in their decision to register in either one as very low. Table 5 shows the high level of the agreement between the two groups on the low importance of prestige.

Table 5

Ratings of the Importance of Prestige in the Decision to Register in Either Mode of Delivery

Importance of Prestige Ratings

Group	M	Mdn	SD	n
ViTAL	3.3	1.0	3.18	29
Homestudy Entire	2.7	1.0	2.60	27
Population	3.0	1.0	2.90	56

Note. The importance of prestige ratings were made on a scale from one to ten where one meant very low and ten meant very high. The two missing values are due to the students' expressed inability to give a rating.
ANOVA.

Barriers. As shown in Table C5, Appendix C, most ViTAL students did not encounter barriers in registering in ViTAL. Those who did (27%) found the set up time to be a barrier. When asked why they did not register in homestudy (see Table C6, Appendix C), the chief response of the ViTAL students was they "Just wanted to learn by CMC". The second most common response was "No reason."

The Homestudy students' responses to the barriers they encountered in registering in homestudy were more varied (see Table C7, Appendix C). The largest group of Homestudy respondents (35%) indicated they encountered no barriers. "Requires more motivation," "Restricted interaction with instructor," and "Too easy to fall behind" were the barriers most often stated. As shown in Table C8 in Appendix C, Homestudy students cited more barriers to registering in ViTAL than ViTAL students did to registering in homestudy. The chief reasons were: "No access to a computer" (29%), "No access to a modem" (18%), "No Internet connection" (13%).

In addition, 21% of the Homestudy respondents did not know they had a choice to take Accounting 253 by ViTAL. Not knowing about the choice was a definite

barrier. Also, the fact that 66% of the Homestudy students did not have an opinion on the prestige level of ViTAL indicates that some AU students may not know much about CMC, also a barrier.

Comparing the Groups By Demographic and Selected Variables

In this section, the ViTAL and Homestudy groups will be compared in terms of their demographic characteristics and other selected variables related in theory and practice to the adoption of computer technology and communications.

It is worth noting again that from April 1, 1996, to September 30, 1997, 847 students registered in the homestudy section, while only 66 registered in the ViTAL section. Though 21% of the sample said they did not know about the choice or did not understand what the choice was, this alone would not explain the difference in the registration numbers. Part of it could be explained by the relative newness of CMC as a mode of delivery, and the present lack of promotion of CMC as an instructional technology. However, a number of the following demographic results indicate that generally the two modes of delivery attract two different groups of students. It also appears that access to the necessary computer communications technology is a factor.

Gender. The sample's gender distribution was roughly representative of the AU population, which is 67% women and 33% men. The number of men and women in both ViTAL and homestudy was roughly representative of the actual populations of both modes of delivery offered in Accounting 253. The gender distribution of the sample is displayed in Table 6.

Table 6

<u>Gender Distribution of Sample According to Mode</u>

	Mode of Delivery		
Gender	ViTAL	Homestudy	<u>n</u>
Male	7 (24%)	8 (28%)	15 (26%)
Female	22 (76%)	21 (72%)	43 (74%)
Total	29 (100%)	29 (100%)	58 (100%)

Geographical Location. In terms of the percent of rural and urban students, the
sample was roughly representative of the AU population, which is estimated to be
75% urban and 25% rural (see Table C9 in Appendix C). The ViTAL and Homestudy
populations did not differ significantly in terms of geographical location.

Age. The ViTAL group was slightly older on average than the Homestudy group
(see Table C10 in Appendix C). This association was in the expected direction, but
not significantly so.

The males and females in the ViTAL section were older than their counterparts
in homestudy. Comparing across the modes of delivery, there was a greater spread
in the males' ages than the females' ages.

Education. As shown in Table 7, the ViTAL students, on average, had
significantly more previous education than did the Homestudy students.

Table 7

<u>Education Levels According To Mode of Delivery</u>

	Mode of Delivery

Education Level	ViTAL	Homestudy	n
High school or less	2 (7%)	7 (24%)	9 (16%)
Voc/Tech certificate	5 (17%)	5 (17%)	10 (17%)
Some university	19 (66%)	9 (31%)	28 (48%)
Bachelor or better	3 (10%)	8 (28%)	11 (19%)
Total	29 (100%)	29 (100%)	58 (100%)

Note. Chi-square (3, $\underline{N}$ = 56) = 8.62, $\underline{p}$ < .05.

Employment. The two groups, ViTAL and Homestudy, did not differ significantly in terms of employment status (see Table C11 in Appendix C).

Income. As shown in Table 8, the ViTAL students, on average, had a significantly higher income level than did the Homestudy students.

Table 8

Income Level According to Mode of Delivery

Income Level	Mode of Delivery		
	ViTAL	Homestudy	n
Under $20,000	6 (22%)	13 (46%)	19 (35%)
$20,000 - $29,999	2 (7%)	6 (21%)	8 (15%)
$30,000 - $39,999	10 (37%)	4 (14%)	14 (26%)
$40,000 and over	9 (33%)	5 (18%)	14 (26%)
Total	27 (100%)	28 (100%)	55 (100%)

Occupational Status. As shown in Table 9, the ViTAL group members had

significantly higher occupational status than the Homestudy group members. Almost

half of the ViTAL students were in the second highest occupational category of five,

mid-management/ semi-professional, while over 40% of the Homestudy students

were in the second lowest category, unskilled workers (see Chapter Three for a

discussion of the occupational status schema used).

Table 9

<u>Occupational Status According to Mode of Delivery</u>

	Mode of Delivery		
Occupational Status	ViTAL	Homestudy	<u>n</u>
High Management/ Professional	0 (0%)	1 (3%)	1 (3%)
Mid-management/ Semi-professional	14 (48%)	3 (10%)	17 (29%)
Skilled Workers	11 (38%)	13 (45%)	24 (41%)
Unskilled Workers	4 (14%)	12 (41%)	16 (28%)

Total	29 (100%)	29 (100%)	58 (100%)

Ethnic Background. The review of the literature indicated that race as a barrier to participating in CMC was of concern. Therefore, the survey question on ethnic background in this study was concerned with identifying visible minorities.

The two groups differed significantly in terms of the number of visible minorities identifying themselves, all but one was registered in the homestudy section (see Table 10).

Table 10

Declared Visible Minority Status According to Mode of Delivery

	Mode of Delivery		
Visible Minority	ViTAL	Homestudy	$\underline{n}$
No	28 (97%)	22 (76%)	50 (86%)
Yes	1 (3%)	7 (24%)	8 (14%)
Total	29 (100%)	29 (100%)	58 (100%)

Note. The number of cells with an expected frequency of less than 5 was 2 of 4.
Chi-square (1, $\underline{N}$ = 58) = 8.22, $\underline{p}$ < .05.

<u>Marital Status.</u> More ViTAL students were married than single, and more Homestudy students were single than married ("married" includes common-law). Eighteen ViTAL students (62%), were married, while only eleven Homestudy students (38%) were married. A chi square analysis showed that the association between the variables Marital Status and Mode of Delivery was approaching significance at $\underline{p}$ = .07, and the association was in the expected direction.

<u>Number of Children.</u> An ANOVA determined the two groups did not differ greatly in average number of children. The mean of the entire population was 1.0 (<u>Mdn</u> = 1.0, <u>SD</u> = 1.10). The average number of children for a ViTAL student was 1.1 (<u>Mdn</u> = 1.0, <u>SD</u> = 1.13), while the mean for the Homestudy student was .86 (<u>Mdn</u> = 0.0, <u>SD</u> = 1.09).

<u>Distance Education Experience.</u> As shown in Table 11, on average, the ViTAL students had significantly more experience with distance education than did the Homestudy students.

Table 11

<u>Distance Education Experience According to Mode of Delivery</u>

DE Experience	Mode of Delivery		
	ViTAL	Homestudy	<u>n</u>
Yes	15 (52%)	7 (24%)	22 (38%)
No	14 (48%)	22 (76%)	26 (62%)
Total	29 (100%)	29 (100%)	58 (100%)

<u>Note.</u> Chi-square (1, $\underline{N}$ = 58) = 4.69, $\underline{p}$ < .05.

Most of the students with distance education experience had taken a course by

the correspondence/homestudy mode of delivery before. Eighty-two percent of those students with distance education experience had experience with correspondence study, 9% had experience with both CMC and correspondence, and 9% had experience with CMC only.

Computer Access. Survey Question #12 asked if students had a computer at home, and if they said no, question #12b asked if they had convenient access anywhere else. Students were asked to respond to the questions about computer access as they would have at the time they had first considered registering in the course. All the ViTAL students had a computer at home that met the requirements of the ViTAL mode of delivery, while over 40% of the Homestudy students did not have a computer at home at all (see Table 12).

Table 12

Computer Access at Home According to Mode of Delivery

Computer at Home	Mode of Delivery		
	ViTAL	Homestudy	$\underline{n}$
Yes	29 (100%)	17 (57%)	46 (79%)
No	0 (0%)	12 (43%)	12 (21%)
Total	29 (100%)	29 (100%)	58 (100%)

Note. Chi-square (1, $\underline{N}$ = 58) = 12.71, $\underline{p}$ <. 05.

Of the Homestudy students who did not have a computer at home, 83% did have convenient access elsewhere, while 17% did not. None of the key variables of

125

Gender, Geographical Location, Age, Education, Visible Minority, Occupational

Status, or Income showed a significant relationship with the variable Computer

Access.

   Modem Access. Survey Question #15 asked the students whether they had a

modem at home. If they answered no, they were asked if they had convenient

access to a modem elsewhere. The students were asked to respond to the

questions on modem access as they would have when they were first considering

registering in the course. All the ViTAL students had a modem at home, while 62%

of the Homestudy students did not (see Table 13).

Table 13

Modem at Home According to Mode of Delivery

	Mode of Delivery		
Modem at Home	ViTAL	Homestudy	n
Yes	29 (100%)	11 (38%)	40 (69%)
No	0 (0%)	18 (62%)	18 (31%)
Total	29 (100%)	29 (100%)	58 (100%)

Note. Chi-square (1, N = 58) = 23.28, p < .05.

   Of those students who did not have a modem at home, 62% had convenient

access elsewhere. Access to modems appeared to be related to education level.

Education Level was the only key variable to approach statistical significance in its association with Modem Access at $\underline{p}$ = .07.

Summary: Profile of CMC Student. From the above demographic, distance education experience, and equipment access analyses, a profile of the typical CMC/ViTAL student in comparison to that of a typical Homestudy student was constructed, followed by a list of characteristics that applied equally to both. The profile and shared characteristics are listed in order of importance for the cultural capital analysis.

The CMC student was more likely than the Homestudy student to:

< have more previous education (some university education);

< have higher occupational status;

< not declare visible minority status;

< have greater access to a computer;

< have greater access to a modem;

< have a higher income level;

< have more distance education experience;

< be somewhat older (average 33 years); and

< be married with one child at home.

The CMC and Homestudy student were just as likely to be:

< female;

< living in an urban area; and

<   employed full-time.

Socio-economic Background, Cultural Capital, and Choice of Delivery Mode

In this third and final section of Chapter Four, the relationship between the students' socio-economic status, familial socio-economic background, and the level to which they possess computer cultural capital will be investigated. This will be accomplished by comparing selected key variables, the Background Variables, and the Cultural Capital Variables.

Background Variables. The results reported for the analysis of the Background Variables and selected key variables include associations that were not found to be statistically significant in order to describe the familial socio-economic backgrounds of the ViTAL and Homestudy students. It is of note that many of the respondents did not know their mother's and father's typical annual incomes.

As shown in Section Two, the ViTAL students generally had higher socio-economic status than the Homestudy students. As a group, they were more educated and had higher occupational status. However, as the following analysis results show, the two groups did not appear to differ fundamentally in terms of their familial socio-economic backgrounds.

The ViTAL and Homestudy groups were similar in terms of the level of their mothers' education. The male students' mothers had a slightly higher level of education. However, within the ViTAL group, the females' mothers had more education (see Table C12 in Appendix C).

As shown in Table C13 in Appendix C, the more educated the student's mother was, the more likely the student was to have more education. Finally, the higher the level of education the student's mother had, the more likely the student was to have higher occupational status (see Table C14 in Appendix C).

The ViTAL groups' mothers were more likely to have higher occupational status than the Homestudy groups', and the male students' mothers were also more likely to have higher occupational status than the female students'. However, within the ViTAL group, the female students' mothers were somewhat more likely to have higher occupational status than the males' (see Table C15 in Appendix C).

The higher the occupational status of the student's mother, the more likely the student was to have more education (see Table C16 in Appendix C). A student with a mother that had a higher occupational status was more likely to have higher occupational status as well (see Table C17 in Appendix C).

ViTAL students' mothers were more likely to have a higher income level than the Homestudy students', and the males' mothers were more likely to have a higher income level than the females'. Within the ViTAL group, the males' mothers were more likely to have had a higher income level than the females' (see Table C18 in Appendix C).

Students with more education were more likely to have mothers with higher income levels (see Table C19 in Appendix C). And, the higher a student's mother's income level, the more likely the student was to have higher occupational status (see Table C20 in Appendix C).

ViTAL students and male students were more likely to have fathers with more

education. Within the ViTAL group, males were also somewhat more likely to have fathers with more education (see Table C21 in Appendix C).

The higher the student's father's education level was, the more likely the student was to have a higher level of education (see Table C22 in Appendix C). The higher the education level of the father was, the more likely the student was to have higher occupational status (see Table C23 in Appendix C).

ViTAL students were more likely to have fathers with higher occupational status than Homestudy students, and the male students were more likely to have a father with higher occupational status than the female students. Within the ViTAL group, the male students were more likely to have fathers with higher status occupations (see Table C24 in Appendix C).

The higher the student's father's occupational status, the more likely the student was to have more education (see Table C25 in Appendix C). And, the higher the student's father's occupational status was, the more likely the student was to have higher occupational status (see Table C26 in Appendix C).

The ViTAL students were more likely to have fathers with a higher income level than were the Homestudy students, and females were more likely to have fathers with a higher income level than males. Within the ViTAL group, the females' fathers were more likely to have the higher income level (see Table C27 in Appendix C).

The higher the student' father's income level, the more likely the student was to have more education (see Table C28 in Appendix C). The higher the student's father's income level, the more likely the student was to have higher occupational status (see Table C29 in Appendix C).

The Background Variables by the variables Mode of Delivery, Gender, Education Level, and Occupational Status analysis did not produce any significant associations. The ViTAL and Homestudy students did not differ significantly in their socio-economic background, and neither did the male and female students. However, the associations that were apparent were in the theoretically expected direction, with the trend being that the higher the socio-economic status of the family, the more likely it was that the participant would have higher socio-economic status. It was interesting that the ViTAL females' socio-economic status seemed to be more related to their mothers' socio-economic status than their fathers'.

Cultural Capital Variables. Firstly, the relationships between the cultural capital variables will be discussed so as to test the utility of the construct of cultural capital used in the study. The symbolic cultural capital variables were Computer at Home and Modem at Home. The instrumental cultural capital variables were: Computer Experience, Modem Experience, Frequency of Computer Use, Frequency of Modem Use, and Computer Comfort. (Refer to Chapter Two's discussion of Persell and Cookson's (1987) concepts of symbolic and instrumental computer cultural capital).

Not all students with a computer at home had a modem at home (see Table 14), but all the ViTAL students had a computer and modem at home (see Tables 12 and 13).

Table 14

Modem at Home By Computer at Home

	Computer at Home		
Modem at Home	Yes	No	Total

Yes	40 (87%)	0 (0%)	40 (69%)
No	6 (13%)	12 (100%)	8 (31%)
Total	46 (100%)	12 (100%)	58 (100%)

Note. Chi-square (1, $\underline{N}$ = 58) = 29.68, $\underline{p}$ < .05.

As shown in Table 15, those students with a computer at home were more likely to declare more computer and modem experience, to use a computer and modem more frequently, and declare a higher level of computer comfort. The only instrumental cultural capital variable that did not have a statistically significant association with the variable Computer at Home was Computer Experience, but the association between the two variables was in the expected direction.

Table 15

Instrumental Cultural Capital By Computer Access at Home (Total Sample)

Cultural Capital		Computer at Home	
		Yes $\underline{n}$ = 46	No $\underline{n}$ = 12
Computer Experience	$\underline{M}$	6.5	5.3
	$\underline{SD}$	2.39	2.46
Modem Experience*	$\underline{M}$	5.1	2.8
	$\underline{SD}$	3.00	1.90
Computer Frequency*	$\underline{M}$	5.2	4.5
	$\underline{SD}$	1.03	2.02
Modem Frequency*	$\underline{M}$	4.7	1.8
	$\underline{SD}$	1.89	1.53
Computer Comfort*	$\underline{M}$	8.6	7.3
	$\underline{SD}$	1.65	2.46

Note. Computer and modem experience were rated on a scale from one to ten where one meant very low and ten meant very high. Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, * $\underline{p}$ < .05.

As shown in Table 16, students with a modem at home were more likely to declare more computer and modem experience, more frequent use of computers and modems, and a higher level of computer comfort.

Table 16

Instrumental Cultural Capital By Modem Access at Home (Total Sample)

		Modem at Home	
Cultural Capital		Yes n = 40	No n = 18
Computer Experience*	M SD	6.7 2.35	5.2 2.17
Modem Experience*	M SD	5.2 2.89	2.6 1.91
Computer Frequency*	M SD	5.6 .931	4.7 1.87
Modem Frequency*	M SD	5.1 1.60	1.9 1.59
Computer Comfort*	M SD	8.9 1.28	7.1 2.45

Note. Computer and modem experience and computer comfort ratings were declared on a scale from one to ten where one meant very low and ten meant very high. Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, * p < .05.

As shown in Table 17, when computer experience ratings were re-coded into three categories (low [1-3], middle [4-6], and high [7-10]), students who declared high computer experience were more likely to declare more modem experience, to use their computers and modems more often, and to be more comfortable using computers.

Table 17

Instrumental Cultural Capital By Computer Experience (Total Sample)

		Computer Experience		
Cultural Capital		Low 1-3 n = 9	Middle 4-6 n = 19	High 7-10 n = 30
Modem Experience*	M	2.7	3.4	6.0
	SD	1.66	2.06	3.10
Frequency of Computer Use*	M	5.1	4.6	5.8
	SD	1.69	1.77	.379
Frequency of Modem Use*	M	3.8	3.1	4.9
	SD	2.44	2.18	1.81
Computer Comfort*	M	7.3	7.4	9.3
	SD	3.08	1.67	.944

Note. Computer and modem experience and computer comfort ratings were declared on a scale from one to ten where one meant very low and ten meant very high. Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, * p < .05.

As Table 18 indicates, those students who gained their computer experience from work or from adult education were more likely to declare more computer experience.

Table 18

Source of Computer Experience By Computer Experience

	Computer Experience		
Computer Experience Source	M	SD	n
Adult Education*			
Yes	7.1	2.29	26
No	5.5	2.33	32
Work*			
Yes	6.9	2.10	34
No	5.3	2.63	24
Someone They Knew			
Yes	6.4	1.52	5
No	6.2	2.51	53
Self-taught			
Yes	6.2	2.37	25
No	6.3	2.50	33

Note. Students declared computer experience on a scale from one to ten, where one meant very low and ten meant very high.
ANOVA, * $p < .05$.

As shown in Table 19, when modem experience ratings are re-coded into three categories (low [1-3], middle [4-6], and high [7-10]), students who declared high modem experience were more likely to declare more computer experience, to use their computers and modems more frequently, and to be more comfortable using computers.

Table 19

Instrumental Cultural Capital By Modem Experience (Total Sample)

		Modem Experience		
		Low 1-3	Middle 4-6	High 7-10
Cultural Capital		n = 26	n = 17	n = 15
Computer Experience*	M	5.0	5.9	8.6
	SD	2.28	1.82	.45
Frequency of Computer Use*	M	5.1	5.1	6.0
	SD	1.47	1.56	.000
Frequency of Modem Use*	M	2.9	4.5	5.8
	SD	2.20	1.91	.561
Computer Comfort*	M	7.6	8.2	9.8
	SD	2.12	1.60	.561

Note. Computer and modem experience and computer comfort ratings were declared on a scale from one to ten where one meant very low and ten meant very high. Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, * p < .05.

The most likely sources of modem experience were self-teaching and work.

Those students citing these sources of modem experience were more likely to

declare higher modem experience (see Table 20).

Table 20

Sources of Modem Experience By Modem Experience

	Modem Experience		
Source of Modem Experience	M	SD	n
Self-taught *			
Yes	5.7	2.90	24
No	3.9	2.76	34
At Work			
Yes	5.6	3.01	20
No	4.1	2.81	38
Someone They Knew			
Yes	4.0	2.67	8
No	4.7	3.00	50
Adult Education			
Yes	3.7	2.45	9
No	4.8	3.01	49

Note. Students declared modem experience on a scale from one to ten where one meant very low
and ten meant very high.
ANOVA, * p < .05.

As shown in Table 21, students who used a computer more frequently were

more likely to have more computer and modem experience, use a modem more

often, and be more comfortable using computers.

Table 21

<u>Instrumental Cultural Capital By Frequency of Computer Use</u> (Total Sample)

		Frequency of Computer Use				
Cultural Capital		2 <u>n</u>=2	3 <u>n</u>=4	4 <u>n</u>=1	5 <u>n</u>=12	6 <u>n</u>=39
Computer	<u>M</u>	3.5	5.0	3.0	5.8	6.7
Experience	<u>SD</u>	3.53	.817	.	1.66	2.55
Modem	<u>M</u>	1.0	3.5	4.0	2.4	5.6
Experience*	<u>SD</u>	.000	1.73	.	1.68	2.42
Modem	<u>M</u>	1.0	1.0	2.0	4.0	4.1
Frequency*	<u>SD</u>	.000	.000	.	2.01	1.95
Computer	<u>M</u>	4.0	6.3	5.0	8.1	9.0
Comfort*	<u>SD</u>	4.24	1.71	.	.900	1.52

<u>Note.</u> Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday. Computer and modem experience and computer comfort ratings were declared on a scale from one to ten where one meant very low and ten meant very high.
ANOVA, * <u>p</u> < .05.

As shown in Table 22, students who used a modem more frequently were more

likely to have more computer and modem experience, use a computer more often, and to be more comfortable using computer.

Table 22

Instrumental Cultural Capital By Frequency of Modem Use (Total Sample)

Cultural Capital		Frequency of Modem Use					
		1	2 n=16	3 n=2	4 n=2	5 n=3	6 n=9 / n=26
Computer Experience	M	5.1	5.0	5.5	6.0	6.3	7.0
	SD	2.21	2.83	2.12	1.73	2.39	2.51
Modem Experience*	M	2.3	3.0	1.5	3.7	5.4	6.3
	SD	1.34	1.41	.707	3.06	1.13	3.11
Computer Use Frequency *	M	4.2	5.0	5.5	5.3	5.8	5.9
	SD	2.01	1.41	.707	.577	.441	.368
Computer Comfort*	M	6.8	6.5	7.0	8.3	9.3	9.2
	SD	2.32	2.12	1.41	.557	.866	1.20

Note. Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday. Computer and modem experience and computer comfort ratings were declared on a scale from one to ten where one meant very low and ten meant very high.
ANOVA, * $p < .05$.

As shown in Table 23, when computer comfort ratings are divided into three categories (low [1-3], middle [1-3], and high [7-10]), students declaring high

computer comfort were more likely to declare more computer and modem

experience, and to use a computer and a modem more often.

Table 23

<u>Instrumental Cultural Capital By Computer Comfort</u> (Total Sample)

		Computer Comfort		
Cultural Capital		Low 1-3 <u>n</u> = 1	Middle 4-6 <u>n</u> = 7	High 7-10 <u>n</u> = 50
Computer Experience*	<u>M</u> <u>SD</u>	1.0 .	4.0 1.63	6.6 2.26
Modem Experience*	<u>M</u> <u>SD</u>	1.0 .	3.0 1.83	4.9 2.99
Frequency of Computer Use*	<u>M</u> <u>SD</u>	1.0 .	4.6 1.90	5.5 1.07
Frequency of Modem Use*	<u>M</u> <u>SD</u>	1.0 .	2.1 1.87	4.5 2.03

<u>Note.</u> Computer and modem experience and computer comfort ratings were declared on a scale from one to ten where one meant very low and ten meant very high. Frequency of computer and modem use ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, * <u>p</u> < .05.

The proxies of the study's construct of cultural capital associate to a significant degree. Students with higher symbolic cultural capital, a computer and modem at home, also declared more computer and modem experience, used a computer and modem more frequently, and had a higher level of comfort using computers. The ViTAL students possessed more symbolic cultural capital than the Homestudy students, but there was no significant difference in symbolic cultural capital possession between the genders.

As shown in Table 24, the Instrumental Cultural Capital variables correlate with each other significantly. In fact, all but Computer Experience and Frequency of Computer Use correlate at an observed significance level of p < . 01.

Table 24

Correlations Between Cultural Capital Variables

	Correlation Coefficients (N = 58)				
Cultural Capital	Computer Experience	Modem Experience	Computer Use Frequency	Modem Use Frequency	Computer Comfort
Computer Experience	1.0	.62**	.32*	.34**	.57**
Modem Experience	.62**	1.0	.36**	.61**	.51**
Computer Use Frequency	.32*	.36**	1.0	.53**	.60**
Modem Use Frequency	.34**	.61**	.53**	1.0	.59**
Computer Comfort	.57**	.51*	.60**	.59**	1.0

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

Students were likely to have gained their computer experience through adult education and work. They were likely to have gained their modem experience

through self-teaching and work.

Cultural Capital Variables and Key Variables. The symbolic and instrumental Cultural Capital variables were analyzed by the key variables deemed of importance, based on the literature reviewed and the demographic results.

Only the variables Mode of Delivery and Education Level had a significant association with the variable Computer at Home. As discussed in the Demographics section, significantly more ViTAL students live in households which possess computers (see Table 12) than do Homestudy students. Of the students with a computer at home, over 90% knew the brand and vital statistics of their computer, from which it was inferred that they were familiar with the medium. There was not a significance difference between the number of ViTAL and Homestudy computer owners knowing the brand and vital statistics of their computer at home.

The students with a computer at home were more likely to have a higher education level than those students without a computer at home (see Table 25).

Table 25

Access to Computer at Home According to Education Level

| | Computer At Home | | |
Education Level	Yes	No	Total
High School or Less	5 (11%)	4 (33%)	9 (16%)
Voc/ Tech Certificate	6 (13%)	4 (33%)	10 (17%)
Some University	25 (54%)	3 (25%)	28 (48%)
Bachelor or Better	10 (22%)	1 (8%)	11 (19%)
Total	46 (100%)	12 (100%)	58 (100%)

Only two key variables were found to be significantly associated with the variable Modem at Home, Mode of Delivery and Visible Minority Status. However, the association between the variables Modem at Home and Occupational Status was in the expected direction and was approaching significance, <u>p</u> = .07. Those students with higher occupational status were more likely to have a modem at home. Additionally, the rural students were more likely to have a modem at home than the urban students. This association had a significance level of <u>p</u> = .06, and was not in the theoretically expected direction.

A significantly greater number of students in the ViTAL group had a modem at home than did the students in the Homestudy group (see Table 13 in Demographics section). Sixty percent of those students with modems at home knew the brand and vital statistics of their modem. Of those students, a greater number of the ViTAL students knew the brand and vital statistics of their modem, than did the Homestudy students (see Table C30 in Appendix C).

As shown in Table 26, students declaring visible minority status were less likely to have a modem at home.

Table 26

<u>Modem at Home According to Visible Minority Status</u>

	Visible Minority Status		
Modem at Home	No	Yes	<u>Total</u>
Yes	37 (74%)	3 (38%)	40 (69%)

No	13 (26%)	5 (62%)	18 (31%)
Total	50 (100%)	8 (100%)	58 (100%)

Note. Chi-square (1, N = 58) = 4.29, p < .05.

Excluding Gender and Education, none of the other key variables appear to be statistically related to the variable Computer Experience, though the association between Occupational Status and Computer Experience was in the theoretically expected direction, p = .08. Those students with higher occupational status were more likely to declare more computer experience.

Table 27 indicates that the computer experience level declared by the students was fairly high. The ViTAL students declared more computer experience than did the Homestudy students.

Table 27

Mode of Delivery By Computer Experience

	Computer Experience			
Mode of Delivery	M	Mdn	SD	n
ViTAL	6.7	7.0	2.55	29
Homestudy	5.7	6.0	2.23	29
Entire population	6.2	7.0	2.43	58

Note. The computer experience ratings were declared on a scale from one to ten where one meant very low and ten meant very high.
ANOVA.

When the computer experience ratings were separated into three categories (low [1-3], middle [4-6], and high [7-10]), as shown in Table 28, the difference in computer experience between the two groups became more evident, and

statistically significant.

Table 28

<u>Computer Experience Ratings by Mode of Delivery</u>

	Mode of Delivery		
Declared Computer Experience	ViTAL	Homestudy	Total
Ratings 1-3 Low	5 (17%)	4 (14%)	9 (16%)
Ratings 4-6 Middle	5 (17%)	14 (48%)	19 (33%)
Ratings 7-10 High	19 (66%)	11 (38%)	30 (52%)
Total	29 (100%)	29 (100%)	58 (100%)

<u>Note.</u> The computer experience ratings were declared on a scale from one to ten where one meant very low and ten meant very high.
<u>Note.</u> Chi-square (2, <u>N</u> = 58) = 6.51, <u>p</u> < .05.

As shown in Table 29, the male students in the sample declared significantly more computer experience than did the female students. Within the ViTAL group itself there was also a difference between the genders' declared computer experience. The male ViTAL students declared more computer experience than the female ViTAL students, but not significantly so.

Table 29

Mode of Delivery and Gender by Computer Experience

| | Computer Experience | | | |
Group	M	Mdn	SD	n
ViTAL				
Male	7.9	9.0	2.80	7
Female	6.4	7.0	2.42	22
Homestudy				
Male	6.8	6.5	2.25	8
Female	5.3	5.0	2.15	21
Entire population*				
Male	7.3	7.0	2.52	15
Female	5.9	6.0	2.29	43

Note. The computer experience ratings were given on a scale from one to ten scale where one meant very low and ten meant very high.
ANOVA, * p < .05.

As shown in Table 30, those students with a higher education level or vocational/technical training were more likely to declare higher computer experience.

Table 30

Education Level By Computer Experience

	Computer Experience			
	M	Mdn	SD	n
Education Level				
School or Less	3.9	3.0	2.32	9
Voc/tech Certificate	7.2	7.5	1.75	10
Some University	6.2	6.5	2.45	28
Bachelor of Better	7.4	7.0	1.75	11
Total	6.2	7.0	2.21	58

Note. The computer experience ratings were given on a scale from one to ten scale where one meant very low and ten meant very high.
ANOVA, $p < .05$.

Excluding Mode of Delivery, Gender, and Occupational Status, Modem Experience was not associated with any of the other key variables at a statistically significant level.

The level of modem experience declared by the students was much lower than the level of computer experience they declared. As shown in Table 31, the ViTAL groups' declared modem experience was significantly higher than that of the Homestudy groups'.

Table 31

Mode of Delivery By Modem Experience

	Modem Experience			
	$\underline{M}$	$\underline{Mdn}$	$\underline{SD}$	$\underline{n}$
Mode of Delivery				
ViTAL	6.0	6.0	3.96	29
Homestudy	3.3	3.0	2.27	29
Entire Population	4.6	4.0	2.94	58

Note. The participants declared their modem experience on a scale from one to ten where one meant very low and ten meant very high.
ANOVA, $\underline{p}$ < .05.

Table 32 shows the students' modem experience by three categories (low [1-3], middle [4-6], and high [7-10] ratings). Six times as many ViTAL as Homestudy students declared high modem experience.

Table 32

Mode of Delivery By Modem Experience Ratings

Declared Modem Experience	Mode of Delivery		
	ViTAL	Homestudy	Total
Ratings (1-3) Low	8 (28%)	18 (62%)	26 (45%)
Ratings (4-6) Middle	8 (28%)	9 (31%)	17 (29%)
Ratings (7-10)	13 (45%)	2 (7%)	15 (26%)

High

Total   29 (100%)   29 (100%)   58 (100%)

Note. The students' modem experience was declared on a scale from one to ten where one meant very low and ten meant very high.
Chi-square (2, $\underline{N}$ = 58) = 11.97, $\underline{p}$ < .05.

As shown in Table 33, the male students in the sample declared significantly more modem experience than did the female students. Within the ViTAL group itself there was also a difference in modem experience. The male ViTAL students declared significantly more modem experience than the female ViTAL students.

Table 33

Mode of Delivery and Gender By Modem Experience

	Modem Experience			
Group	$\underline{M}$	$\underline{Mdn}$	$\underline{SD}$	$\underline{n}$
ViTAL*				
Male	9.1	10.0	1.46	7
Female	5.0	5.0	2.57	22
Homestudy				
Male	4.4	4.0	3.20	8
Female	2.9	3.0	1.71	21
Entire population*				
Male	6.6	7.0	3.53	15
Female	3.9	3.0	2.46	43

Note. The students' modem experience was declared on a scale from one to ten scale where one meant very low and ten meant very high.
ANOVA, * $\underline{p}$ <.05.

As shown in Table 34, the more occupational status a participant had, the more likely he/she was to declare higher modem experience. The modem experience declared by the second highest category of occupational status, Mid-managers/ Semi-professionals, was double, or almost double, that of the other three

occupational status categories present in the sample.

Table 34

Occupational Status By Modem Experience

	Modem Experience			
Occupational Status	M	Mdn	SD	n
1 High management/ Professional	2.0	2.0	.	1
2 Mid-management/ Semi-professional	6.9	7.0	2.75	18
3 Skilled Workers	3.5	3.0	2.45	23
4 Unskilled Workers	3.8	2.4	2.44	16
Total	4.1	4.0	2.55	58

Note. The students declared modem experience on a scale from one to ten scale where one meant very low and ten meant very high.
ANOVA, $p < .05$.

Only the key variables Mode of Delivery, Occupational Status, and Income

Level were significantly associated with the variable Frequency of Computer Use.

Table 35 indicates that ViTAL students were more likely to use computers more

frequently than Homestudy students.

Table 35

Mode of Delivery By Frequency of Computer Use

		Frequency of Computer Use			
Mode of Delivery		M	Mdn	SD	n
ViTAL	5.9	6.0	.310	29	
Homestudy		4.7	5.0	1.69	29

Entire Population	5.3	6.0	1.21	58

Note. Computer use frequency ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, $p < .05$.

As shown in Table 36, the higher the level of occupational status of the

students, the more likely they were to use a computer more frequently.

Table 36

Occupational Status By Frequency of Computer Use

Occupational Status _____	Frequency of Computer Use			
	M	Mdn	SD	n
High Management/ Professionals	5.0	5.0	.	1
Mid-management/ Semi-professionals	5.9	6.0	.236	18
Skilled Workers	5.6	6.0	.891	23
Unskilled Workers	4.2	5.0	1.90	16
Within Groups Total	5.3	6.0	1.16	58

Note. Computer use frequency ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA, $p < .05$.

As shown in Table 37, the higher the income level of the participant was, the

more likely the participant was to use a computer more frequently.

Table 37

Income Level By Frequency of Computer Use

	Frequency of Computer Use			
Income Level	M	Mdn	SD	n
Under $20,000	4.5	5.0	1.87	19
$20,000 - 29,999	5.4	6.0	1.41	8
$30,000 - 39,999	5.7	6.0	.611	14
$40,000 and over	5.8	6.0	.426	14
Within Groups Total	5.3	6.0	1.28	55

Note. Computer use frequency ratings were declared on a scale from one to six where one meant hardly ever and six meant almost everyday. The three missing values are a result of three students declining to answer the survey question about their typical annual income.
ANOVA, $p < .05$.

The variables Age and Visible Minority Status were the only two key variables that were not significantly associated, or close to being significantly associated, with the variable Modem Use Frequency.

The frequency with which the Homestudy students used modems was much lower than the frequency with which they used computers. As shown in Table 38, the ViTAL students were much more likely to use a modem more frequently than were the Homestudy students.

Table 38

Mode of Delivery By Frequency of Modem Use

| | | Frequency of Modem Use | | | |
Mode of Delivery		M	Mdn	SD	n
ViTAL	5.7	6.0	.712	29	
Homestudy		2.6	1.0	1.98	29
Entire Population		4.2	5.0	1.48	58

Note. The students declared the frequency with which they used modems on a scale from one to six, where one meant almost never and six meant almost everyday.
ANOVA, p < .05.

As shown in Table 39, the male students were more likely to use a modem more often than were the female students.

Table 39

Gender By Frequency of Modem Use

| | Frequency of Modem Use | | | |
Gender	M	Mdn	SD	n
Male	5.1	6.0	1.44	15
Female	3.8	5.0	2.28	43
Entire Population	4.1	5.0	2.11	58

Note. The students declared the frequency with which they used modems on a scale from one to six, where one meant almost never and six meant almost everyday.
ANOVA, p < .05.

As shown in Table C31 in Appendix C, within the ViTAL group there was no difference between the frequency with which males and females used modems.

As shown in Table 40, the higher the occupational status of the student was,
the more likely he/she was to use a modem more frequently.

Table 40

Occupational Status By Frequency of Modem Use

	Frequency of Modem Use			
Occupational Status	M	Mdn	SD	n
High Management/ Professionals	1.0	1.0	.	1
Mid-management/ Semi-professionals	5.4	6.0	1.25	18
Skilled Workers	4.0	5.0	2.15	23
Unskilled Workers	3.0	1.5	2.25	16
Within Groups Total	4.1	5.0	1.95	58

Note. Modem use frequency ratings were declared on a scale from one to six, where one meant
hardly ever and six meant almost everyday.
ANOVA, $p < .05$.

As shown in Table 41, the higher the income level of a student, the more likely
the student was to use a modem more frequently.

Table 41

Income Level By Frequency of Modem Use

| | Frequency of Modem Use | | | |
Income Level	M	Mdn	SD	n
Under $20,000	3.2	1.0	2.36	19
$20,000 - 29,999	3.5	4.0	2.27	8
$30,000 - 39,999	5.1	6.0	1.66	14
$40,000 and over	4.9	6.0	1.64	14
Within Groups Total	4.2	5.0	2.02	55

Note. Modem use frequency ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday. The three missing values are a result of students declining to answer the survey question about their typical annual income.
ANOVA, $p < .05$.

As shown in Table 42, the higher the education level of a participant was, the more likely the participant was to use a modem more frequently.

Table 42

Education Level By Frequency of Modem Use

| | Frequency of Modem Use | | | |
Education Level	M	Mdn	SD	n
High School or Less	2.8	2.0	1.99	9
Voc/tech Certificate	3.7	4.0	2.31	10
Some University	4.9	6.0	1.90	28
Bachelor or Better	3.7	5.0	2.33	11
Within Groups Total	4.1	5.0	2.07	58

Note. Modem use frequency ratings were declared on a scale from one to six, with one meant hardly ever and six meant almost everyday.
ANOVA, $p < .05$.

155

Urban students were more likely to use modems more frequently than were rural students (see Table 43). The variance between the urban and rural means is approaching significance at p = .06.

Table 43

Geographical Location By Frequency of Modem Use

		Frequency of Modem Use			
Geographical Location		M	Mdn	SD	n
Urban	4.5	5.5	2.03	42	
Rural		3.3	2.5	2.32	16
Within Groups Total		4.1	5.0	2.11	58

Note. Modem use frequency ratings were declared on a scale from one to six, where one meant hardly ever and six meant almost everyday.
ANOVA.

The variables Mode of Delivery and Occupational Status are the only key variables that associated at a statistically significant level with the variable Computer Comfort. However, Gender and Income associated with Computer Comfort at a level approaching statistical significance, p = .06.

As shown in Table 44, the sample in general declared a high level of computer comfort. The ViTAL group declared a significantly higher level of computer comfort than did the Homestudy group.

Table 44

Mode of Delivery By Computer Comfort

		Computer Comfort		
Mode of Delivery	M	Mdn	SD	n
ViTAL	9.2	10.0	1.20	29
Homestudy	7.5	8.0	2.12	29
Entire Population	8.4	9.0	1.90	58

Note. The students declared computer comfort ratings on a scale from one to ten scale where one meant very low and ten meant very high.
ANOVA, $p < .05$.

As shown in Table 45, the males in the sample were more likely to declare more computer comfort than were the females, as were the male ViTAL students more likely to declare more computer comfort compared to the female ViTAL students.

Table 45

Mode of Delivery and Gender By Computer Comfort

		Computer Comfort		
Group	M	Mdn	SD	n
ViTAL				
Male	9.7	10.0	.756	7
Female	9.0	9.5	1.27	22
Homestudy				
Male	8.5	8.5	1.20	8
Female	7.1	8.0	2.29	21
Entire Population				
Male	9.1	10.0	1.16	15
Female	8.1	8.0	2.05	43

Note. The students declared computer comfort ratings on a scale from one to ten scale where one

meant very low and ten meant very high.
ANOVA.

As shown in Table 46, the higher the occupational status of the student, the
more likely he/she was to declare a higher level of computer comfort.

Table 46

Occupational Status By Computer Comfort

| | Computer Comfort | | | |
Occupational Status	M	Mdn	SD	n
High Management/ Professionals	7.0	7.0	.	1
Mid-management/ Semi-professionals	9.0	10.0	1.50	18
Skilled Workers	8.7	9.0	1.19	23
Unskilled Workers	7.2	8.0	2.61	16
Within Groups Total	8.4	9.0	1.90	58

Note. The students declared computer comfort ratings on a scale from one to ten scale where one meant very low and ten meant very high.
ANOVA, $p < .05$.

As shown in Table 47, the higher the income level of a student was, the more
likely he/she was to declare a higher level of computer comfort.

Table 47

Income Level By Computer Comfort

	Computer Comfort			
Income Level	M	Mdn	SD	n
Under $20,000	7.4	8.0	2.34	19
$20,000 - 29,999	8.9	9.0	1.13	8
$30,000 - 39,999	8.8	9.0	1.48	14
$40,000 - 49,999	8.9	10.0	1.64	14
Within Groups Total	8.4	9.0	1.83	55

Note. Computer comfort ratings were declared on a scale from one to ten, where one meant very low and ten meant very high. The three missing values are a result of students declining to answer the survey question about their typical annual income.
ANOVA.

Many of the key variables associated with the Cultural Capital variables at the observed significance level of p <.05 or associated at a level approaching it.

< ViTAL students and those students with a higher education level were more likely to have a computer at home.

< ViTAL students, students not declaring visible minority status, students with higher occupational status, and rural students were more likely to have a modem at home.

< ViTAL students, males, and those students with a higher education level and more occupational status were more likely to declare more computer experience.

< ViTAL students, males, and those students with higher occupational status were more likely to declare more modem experience.

159

<   ViTAL students and those students with higher occupational status and income levels were more likely to use a computer more frequently.

<   ViTAL students, males, those students with higher occupational status and income and education levels, and urban students were more likely to use a modem more frequently.

<   ViTAL students, males, and those students with more occupational status and higher income levels were more likely to be more comfortable using computers.

    <u>Background Variables and Cultural Capital Variables.</u> The following is a description of the results of a comparison between the Background Variables and the Cultural Capital Variables. The variables were not associated at a statistically significant level, but a summary of the results of the analyses is necessary for the descriptive purposes of the study.

    Whether a student had a computer at home was not related to his/her mother's education level. Students whose mothers had a higher education level were somewhat more likely to have had a modem at home (see Table C32 in Appendix C). The results of the comparisons between the means of the instrumental cultural capital variables and Mother's Education Level were in the theoretically expected direction. Those students with a mother with a higher education level were more likely to declare more computer and modem experience, use a computer and modem more often, and to be more comfortable with using computers than were those students with a mother with a lower education level (see Table C33 in Appendix C).

The likelihood of a student having a computer or modem at home was not related to his/her mother's occupational status (see Table C34 in Appendix C). The results of the comparisons between the means of the Instrumental Cultural Capital variables and Mother's Occupational Status were in the theoretically expected direction. Those students with a mother with higher occupational status were more likely to declare more computer and modem experience, use a computer and modem more often, and to be more comfortable with using computers than were those students with a mother with lower occupational status (see Table C35 in Appendix C).

Except in the case of the students whose mothers had an income of $40,000 or more, students with a computer and modem at home were more likely to have a mother with a lower income level (see Table C36 in Appendix C). The results of the comparisons between the means of the Instrumental Cultural Capital variables and Mother's Income Level were in the theoretically expected direction. With few exceptions, those students with a mother with a higher income level were more likely to declare more computer and modem experience, use a computer and modem more often, and to be more comfortable with using computers than were those students with a mother with lower income level (see Table C37 in Appendix C).

Whether a participant had a computer or modem at home was not related to his/her father's education level (see Table C38 in Appendix C). Unlike the results for the comparisons between Instrumental Cultural Capital variables and Mother's Education Level, the associations in the same comparison for Father's Education Level were not as consistent. However, those students with a father with a bachelor

degree or better were more likely to declare more computer and modem experience, use a computer and modem more often, and to be more comfortable using computers than were those students whose fathers had a high school diploma or less (see Table C39 in Appendix C).

Excluding the case of the students whose fathers were farmers, students with fathers with higher occupational status were more likely to have a computer and modem at home (see Table C40). With exceptions in the skilled and unskilled father's occupational status categories, the students with fathers with higher occupational status were more likely to declare more computer and modem experience, to use a computer and modem more often, and to be more comfortable with using computers (see Table C41 in Appendix C).

As shown in Table C42 in Appendix C, students with fathers with a higher income were more likely to have a computer and modem at home. With the exception of one student with a father with an income of $20,000 or less, the students with fathers with higher incomes were more likely to declare more computer and modem experience, to use a computer and modem more often, and to be more comfortable with using computers (see Table C43 in Appendix C).

None of the Background Variables associated with the Cultural Capital Variables at the observed significance level of $p < .05$. Some variables appeared to be somewhat associated and some did not. The associations that were found were in the theoretically expected direction. Generally, the higher the socio-economic status of the student=s parents, the more likely the student was to possess more symbolic and instrumental cultural capital. However, the extent to which the students

possessed symbolic cultural capital was less likely to be related to their familial socio-economic background than was the level of instrumental cultural capital they possessed.

Chapter Summary

Chapter Four presented the results of the data analysis. Firstly, the data collected on the inducements and barriers to studying by ViTAL and homestudy were analyzed. In the second section, the demographic and selected variables were analyzed. The third section analyzed the key variables and the key groups of variables and the associations between them.

CHAPTER V

Conclusions and Recommendations

Purpose of the Chapter

The purpose of this chapter is to discuss, interpret, and evaluate the results

of the study presented in Chapter Four. Conclusions will be drawn in answer to the

study's three research questions, as presented in Chapter One. Recommendations

will be based on the conclusions. Suggestions for further research will be made from

the study's conclusions and limitations.

Discussion of the Results

Perceptions: Inducements and Barriers

The following discussion addresses the results pertaining to the first research

question, What inducements and barriers do students give as reasons for their

choice of delivery mode? The implications of the results are also discussed.

The results pertaining to the first research question suggest that CMC and

correspondence students have different reasons for their choice of delivery mode,

and encounter different barriers in making their choice. Interest in computer

communications technology is an inducement for choosing CMC, while convenience

or flexibility is an inducement for choosing homestudy. The higher perceived

prestige level of CMC did not act as an inducement for registering in CMC.

Homestudy students experience more barriers to registering in homestudy

than ViTAL students do in ViTAL. The ViTAL students encountered set up

difficulties, while the barriers that Homestudy students encountered were motivational, lack of interaction with the instructor, and they found it too easy to fall behind. The ViTAL students did not reject homestudy as a mode of delivery, but were just interested in studying by CMC. The Homestudy students did not choose ViTAL because they did not have access to the required technology or they did not understand or know about the choice to study by CMC.

Richards et al. (1995), Schrum (1995), and Rekkedal's (1990) observations that students choose to study by CMC because they are interested in the nature and application of computer communications technology are supported by the study results. This implies that CMC students may choose CMC out of interest, not out of necessity. CMC students also perceive pedagogical benefits to studying by CMC, such as faster communications, more interaction with the instructor, and more feedback. However, the ViTAL students did not perceive more interaction with their peers as being a inducement. This contradicts the suggestion that the potential for peer interaction and collaboration is a universal inducement or pedagogical benefit of CMC. This implies that some distance education students may not value peer interaction to the extent that is believed by some distance educators. Some students want more interaction with the instructor, and more and faster feedback.

The main inducement for studying by homestudy is its flexibility. Convenience played a large role in the Homestudy students' decision to enrol in homestudy. This is in agreement with Hodes' (1993) conclusion that students perceive print-based courses as more convenient than traditional classroom or computer-based courses. The implication is that homestudy is seen as an effective mode of delivery for

165

meeting students' needs in terms of their personal situations.

Reagan (1987) and Atkin and LaRose (1994) suggest that perceived benefits are the most important predictors of technology adoption. The results of this study indicate that this may be the case for the students choosing to study via computer communications technology. The ViTAL students perceived the pedagogical benefits of the CMC delivery mode. The Homestudy students, on the other hand, required flexibility and that need is what dictated their choice of delivery mode. Though the benefits of CMC may have been perceived, some Homestudy students' situations were such that they did not effectively have the choice to take the course by ViTAL. This implies that there are barriers to accessing CMC that are related to students' personal situations.

Rekkedal's (1990) position that students make a deliberate choice when choosing a mode of delivery and that correspondence and CMC serve two different target groups with different needs is supported by the study results, except in the case of the 21% of Homestudy students who did not know about the ViTAL option. The results suggest that Hodes' (1993) observation that some students perceive correspondence as being more convenient is accurate. CMC is not as convenient as homestudy because one needs convenient access to a computer and modem to perform certain course requirements. In the case of AU's Accounting 253, students must read the text on screen or print it to read elsewhere. The implication is that to meet the needs of the current student population of AU, dual medium delivery is necessary.

The barrier most often cited by the ViTAL students to registering in CMC was

the set up time required as some had technical problems associated with setting up their equipment and software. The implication is that technical support services are a necessity for supporting ViTAL students.

The ViTAL students did not give reasons related to their personal situations as barriers to registering in CMC, whereas the Homestudy students did. This again implies that the flexibility of homestudy is meeting the needs of students whose personal situations do not allow them to access CMC.

Thompson's (1990) observations about the disadvantages of correspondence are supported by the kinds of barriers the Homestudy students encountered in registering in homestudy. They perceived the barriers to registering in homestudy as: requires more motivation, lack of interaction with the instructor, and too easy to fall behind. In the Thompson study, the students' recommendations for improving correspondence study did not include recommending more interaction with peers. As noted above, the results of the study show that lack of interaction with peers was not a problem according to either group. This implies that lack of interaction with peers does not appear to be a barrier or an inducement for either mode of delivery.

Rekkedal's (1990) observation that prospective students do not understand what CMC entails is borne out by the results of this study. One-fifth of the participants did not know about the ViTAL option, and 66% of the Homestudy students would not rate the prestige level of CMC because they felt they did not know enough about it or did not understand what it was. Lack of awareness of CMC is a barrier to choosing CMC. The implication is that the distance education community, as represented by AU, is not getting the information about CMC out to a

substantial number of prospective students.

The fact that only 66 students registered in ViTAL from April 1, 1996, to September 30, 1997, implies that there are barriers to choosing CMC and that the inducements for studying by CMC are not widely perceived. Surely more than 66 of the over 900 students registered in the course had an interest in computer communications and perceived pedagogical or other benefits to studying by CMC. Not knowing about the ViTAL option and not understanding what CMC is may account for some of the difference in the registration numbers, but not all.

One of the barriers that the Homestudy students most often gave for not registering in the ViTAL option was a lack of access to the computer communications technology required for CMC. Rekkedal (1990) claims that computer equipment does not seem to be a major barrier towards recruitment to electronic distance studies, though he does agree that the availability of modems is a barrier. The results of this study indicate that there are equipment barriers, and this is especially the case in terms of modems. The implications of the results are that some students do not have access to the required equipment to study by CMC, and therefore the technology itself is a barrier to choosing CMC, as well as an inducement. The extent and implications of computer communications technology barriers will be discussed in more detail later in this chapter.

The participants in both the ViTAL and Homestudy group perceived the prestige level of CMC as being higher than the prestige level of homestudy. This was the theoretically expected result. Many people in society see technological development as either positive, necessary, or inevitable, as discussed in the

literature review.

Two-thirds of the Homestudy students expressed their inability to rate the prestige of CMC because they did not know or understand what CMC was all about. It is interesting that those participants who did not know much about CMC did not rate it highly only because it involved computer technology, implying that the higher technology involved in CMC may not be the only reason the prestige ratings of CMC were higher. Therefore, there must be other reasons for the higher CMC prestige ratings.

Bourdieu (1984, 1986) theorizes that it is the scarcity or the possession of a rare product or knowledge by the dominant class, that gives goods and knowledge their value in society. The scarcity of the technology and skills required to access CMC, and the possession of those by the higher classes, would therefore make taking a course by CMC more prestigious or socially valuable. CMC would have greater symbolic value. Bourdieu further theorizes that things that are common or are necessities, and therefore available to all, are under-valued. So, it is the necessity and commonness of studying by homestudy that lowers its prestige. His examples are the devaluing of work when women become the majority of workers in an occupation, and also the devaluing of education credentials when they become more commonly possessed. The low prestige of distance education itself could be a result of its availability. It is may be that it is not valued as highly as traditional education because it is more easily accessed and obtained by the masses.

One implication of the logic of the competition for valuable consumer goods

for the use of CMC in distance education is that once CMC as a mode of delivery is

no longer seen as a rare commodity and it becomes more accessible, its prestige or

value will decline. It is interesting that the ViTAL students rated the prestige of CMC

lower than did the Homestudy students, implying that this process may already be

underway. The higher status that distance education seems to have gained from

using electronic means and the Internet in the delivery of courses may be lost once

they become more widely accessed.

The participants' perceptions of CMC as a more prestigious mode of delivery

did not play a factor in their mode of delivery decision, though the fact that 66% of

the Homestudy students did not feel able to give an opinion on the prestige level of

CMC makes this result somewhat questionable, because of the small number of

respondents involved. However, the great majority of students did not think the

prestige level of the mode of delivery was important in their decision to enrol in CMC

or homestudy. The implication is that necessity and interest override social prestige

considerations at this level of decision-making about education.

Demographics, Socio-economic Status, and Access to Computer Communications Technology

The following discussion addresses the results pertaining to the second

research question, How do the two self-selected groups compare with each other in

terms of demographic variables and selected variables related in theory and practice

to the adoption of computer communication technology? The implications of the

results are also presented.

The ViTAL and Homestudy groups did not differ significantly in terms of gender, geographical location, age, number of children, and employment status, but they did differ in terms of education and income levels, occupational status, marital status, visible minority status, distance education experience, and access to CMC technology. The typical profile of the CMC student constructed from these results affirms the demographic findings in the literature reviewed, with a few notable exceptions. Some of the characteristics of CMC students identified can be seen as predictors for choosing CMC.

The percent of women in the ViTAL sub-sample that was enumerated was roughly representative of the AU population. Women were also the majority in the Richards (1995) study. The gender results can be interpreted to mean that in this study women were not under-represented in CMC, and that gender is not a predictor of choosing CMC. Gender as a possible barrier to accessing CMC will be discussed in more detail in the section on cultural capital, as will the implications of the gender results.

The sample was also roughly representative of the urban/rural ratio of AU's student population, and there was not a significant difference in the rural/urban ratio between ViTAL and homestudy sections. The fact that rural students were not under-represented in the CMC group supports Rekkedal's (1990) conclusion that geographical location is not a predictor of choosing CMC. The implication is that geographical location may not be a barrier to accessing CMC.

Age did not act as a predictor for choosing CMC. Though the ViTAL students

and females in the sample were slightly older, the differences in age were not significant. The age results were in accordance with the findings of Richards (1995) and Rekkedal (1990). The implication is that age may not act as a barrier to CMC. However, as the range of ages of the participants in the study was 20 - 50 years, this generalization may be limited.

Education level appears to be a predictor of choosing CMC. ViTAL students, on average, had significantly more previous education than did the Homestudy students. This result is consistent with Rekkedal's (1990) findings that CMC students have more previous education than do correspondence students. The implication is that having a low education level could be a barrier to accessing CMC.

Employment status was not a predictor of choice of mode of delivery in the study, as both the ViTAL and Homestudy groups had roughly the same employment level, with most participants working full-time. This contradicts Rekkedal's (1990) finding that correspondence and prospective students were more often unemployed than were CMC students. However, the study results are in agreement with his observation that CMC students were more often employed in higher level occupations, and this will be discussed later. The implication is that employment status may not be a barrier to accessing CMC.

Having a higher income appears to be a predictor of choosing CMC, as ViTAL students had higher incomes on average than did the Homestudy students. In the literature, low income was considered to be a barrier to socially disadvantaged groups accessing CMC (Fage and Mills, 1996), and a higher income was a predictor for adopting certain technological innovations (Atkin & LaRose,

1994; Dutton et al., 1987). These observations are borne out by the study's results. The implication is that having a low income may be a barrier to accessing CMC. Further discussion of contradictions within the results regarding income will take place later in this chapter.

Occupational status also appears to be a predictor of choosing CMC. The ViTAL students had higher occupational status, on average, than did the Homestudy students. This supports Rekkedal's (1990) finding that CMC students worked in higher level occupations, and the findings of the literature on technological adoption (Atkin & LaRose, 1994; Dutton et al., 1987). The implication is that low occupational status may be a barrier in accessing CMC.

Though the survey did not require participants to declare their ethnic backgrounds in terms of visible minorities, there was a significant difference in the groups as to the number of participants that declared visible minority status. Only one ViTAL student declared visible minority status which could mean, as Richards et al. (1995) note, that being white is a predictor of choosing CMC. Harvey's (1986-87) conclusion that race is a barrier to accessing computers and computer skills may apply in that it is often racial groups who are the poorest and the least educated. In this case, all but one of the participants declaring visible minority status were registered in homestudy, and the Homestudy students had less education, less income, and lower occupational status. The implication is that visible minority status may be a barrier to accessing CMC, but further findings which contradict this suggestion will be discussed later in this chapter.

The study results indicate that CMC students are more likely to be married

and have one child at home. This is consistent with Rekkedal's (1990) conclusion

that CMC students were to a larger extent established in a family situation. This

result could be partly explained by the fact that the ViTAL group was slightly older

and thus more likely to be married and have children, but that does not take away

from the implication that along with being more financially secure, CMC students are

more established in terms of their personal situations. This implication is supported

by the fact that the Homestudy students were more likely to cite their personal

situations as a barrier to studying by homestudy.

Experience in distance education did seem to play a role in the decision to

enrol in either ViTAL or homestudy, which supports Rekkedal's (1990) findings.

ViTAL students had significantly more previous experience with correspondence

and CMC. As Rekkedal suggests, having more distance education experience may

give a student the confidence to try a new form of delivery. It would also make the

student more aware of the delivery mode options. Hodes' (1993) observation that

students with experience in correspondence stick with correspondence is somewhat

contradicted in this instance. The implication of this finding is that previous

experience in distance education may act as a predictor of choosing CMC, and that

using CMC in introductory courses may be a barrier to students studying at a

distance for the first time. The skills and equipment required may make the

enterprise seem too much to take on when one is not familiar with learning at a

distance to begin with. There are more unknowns to deal with than just familiarizing

oneself with the requirements of distance learning and the course content.

As discussed earlier, a large number of Homestudy students gave lack of

access to computer communications technology as one of the reasons they did not register in the ViTAL section. They were less likely to have convenient access to a computer and modem than were ViTAL students. This result is in agreement with Atkin and LaRose's (1994) conclusions that there is a positive empirical relationship between early adoption of a technology and higher income and education levels and higher occupational status. Those students with more income, higher education levels, and higher occupational status were more likely to have enroled in the ViTAL section.

As Atkin and LaRose (1994) suggest, from their review of the literature on technological adoption, that there is a levelling of demographic variables in the diffusion of personal computers, and this observation seems to apply in the case of distance education students at AU. More of the student population has access to a home computer than ever before. However, the difference between the ViTAL and Homestudy students' access to computer was still significant. All the ViTAL students had convenient access to a computer, but 17% of the Homestudy group did not. It appears that computer access may still be a barrier to studying by CMC, though less of a problem for some than it used to be.

The diffusion of modem technology is not as widespread. Access to modems appears to be the major equipment barrier for prospective students in accessing CMC technology at this point in time. This conclusion is in agreement with Rekkedal's (1990) similar findings. The implications of this result are threefold. First, at one level, the diffusion of technology theory applied to distance education methods is encouraging. Eventually, most AU students may have access to a

computer and modem so that they will have the technological means to access CMC.

From another perspective, as Reagan (1987) suggests, there may be different predictors for the adoption of different types of media, and there may be different patterns for their adoption. Some technological innovations in distance education may never reach the general student population. As Daniel (1996) warns, there is the possibility that a chasm exists between the Αinnovators@ and the majority of students in adopting technological innovations in distance education. The implication is, as mentioned previously, that concentrating resources on CMC to the detriment of the homestudy offerings may not be wholly beneficial to distance education students and institutions.

Finally, it also may be that there is another pattern here, at a deeper level. The historical trends suggested by the literature on technological adoption indicate that as new interactive technologies develop and are used in educational innovations, the socially and economically advantaged members of society will always have access to them first, as technological innovations are generally more expensive than older technologies and require more skill to operate. The already advantaged will be the first to acquire technologies and skills which give them a greater advantage in the employment market. This will continue to be the case if access to the implementation of educational innovations is based on marketplace values. Without equity policies in place at the start, the division between the advantaged and disadvantaged will continue to be reproduced as Bourdieu theorizes.

In order to address the accuracy of the different possible scenarios described above, a study investigating the ratio of Homestudy and ViTAL students in AU's Accounting 253 in the future would be necessary. Another study would be necessary in order to find out whether ViTAL was chosen by more than the 7% of the total Accounting 253 student body that had registered in ViTAL from April 1, 1996, to September 30, 1997. Also of interest would be whether the socio-economic status of the ViTAL students was still significantly higher than the Homestudy students= socio-economic status. This further research may better answer the question as to whether CMC technology is following the standard diffusion pattern.

Cultural Capital and Access to CMC

The following is a discussion of the results which pertain to the final research question, To what extent does cultural capital mediate the relationship between socio-economic status, socio-economic background, and choice of delivery mode? The discussion of the results of the analysis of socio-economic status, familial socio-economic status, and cultural capital establish the socio-economic barriers identified by the demographic analysis in a theoretical context. The implications of the results will also be presented.

The results pertaining to the third research question suggest that students with higher socio-economic status have more symbolic and instrumental cultural capital and are more likely to choose to study by CMC. That higher level of possession of cultural capital comes from education and occupational sources more than it comes directly from their family socio-economic background. However, the trends in the results show there may be some relationship between cultural capital

level and family socio-economic background.

Cultural Capital: Symbolic and Instrumental. The participants with a computer and modem at home (symbolic cultural capital) possessed more instrumental cultural capital. They declared more computer and modem experience, used a computer and modem more frequently, and were more comfortable using computers. And, all the proxies of instrumental cultural capital correlated, meaning that if a student had one type of instrumental cultural capital he/she was likely to have the others. The implications of the strong relationship between symbolic and instrumental cultural capital and between the instrumental cultural capital proxies are that they appear to be valid indicators of the new form of cultural capital as conceived of by Persell and Cookson (1987).

As such, the results of the study indicate that ViTAL students possessed more symbolic and instrumental cultural capital than did the Homestudy students. The ViTAL students were more likely to have computers and modems at home, and they possessed to a significantly greater extent all of the proxies of instrumental cultural capital than did the Homestudy students. It can be suggested that the extent to which a student possesses cultural capital is related to choosing CMC. Those students that possessed more symbolic and instrumental cultural capital were more likely to choose CMC as a mode of delivery. Thus, lack of cultural capital may be a barrier to accessing CMC.

It was found that the majority of participants gained their computer experience from adult education and/or work. The implication is that there is a connection between instrumental cultural capital and socio-economic status.

Education and occupation are major sources of cultural capital. Those with more education and higher occupational status, higher socio-economic status, have greater opportunity to gain instrumental cultural capital.

The majority of the participants gained their modem experience through self-teaching and/or work. This result again shows that occupation is a source of cultural capital, implying as in the case of computer experience, that higher socio-economic status provides more opportunity for acquiring instrumental cultural capital. The self-teaching response may indicate that the students had the confidence or comfort with technology already to take on another technological innovation.

Rekkedal's (1990) conclusion that lack of experience with computers and modems does not seem to determine the choice of delivery mode is contradicted by this study's results. Though the participants in this study did not give lack of computer and modem experience and skills as reasons for not studying by CMC, there is evidence that a lack of these types of experience and skills may act as barriers. The ViTAL group declared more computer and modem experience on average than did the Homestudy group. There were students that chose homestudy though they declared high computer and modem experience levels, and it may be that these students found homestudy more convenient. Hodes' (1993) observation that students found correspondence more convenient may be true in these cases. She found that the participants in her study were all technical professionals, so fear of computer delivery systems or Atechnophobia@ was not thought to be a confounding factor in them declaring correspondence as more convenient than traditional and computer-based courses. This result indicates that not all students

who have more computer experience want to learn by computer communications technology. The implication again is that homestudy is preferred by some students and should remain a mainstay of distance education. Familiarity with computer technology, as suggested by Hodes (1993) and Atkin (1995), does not necessarily mean affinity.

Atkin's (1995) suggestion that the more compatible an innovation is with previous innovations, in this case an educational innovation using computer communication technology, the more likely it is to be adopted is supported by the study results. The ViTAL students declared more computer and modem experience and more computer comfort than did the Homestudy students. Prior experience with similar technologies was also said to be a predictor of adopting new technologies according to Atkin, and the study results suggest this.

Gender. Access to computer technology at home did not differ significantly between the genders. The implication is that, for the women in this study, there is now access to computers to the extent that access by gender is a non-issue. In terms of convenient access to modems, the difference between the genders is greater, and this follows from the diffusion of technological adoption theory. Modem technology is still relatively new and it may not have diffused much past the early adopter stage. As most technological adoption studies have found, males tend to adopt new technologies earlier than women. The implications of this are that in the early stages of an educational innovation based on new technology, women may be disadvantaged in their access to symbolic cultural capital. The consequences of this initial disadvantage is that some women will always be one step behind in gaining

the cultural capital that opens up more educational opportunities, like CMC, which in turn also opens up occupational opportunities.

Gender may not be a predictor of choosing CMC, but it may be that a lack of computer skills is more likely to be a barrier to accessing CMC for females than males. The results of the analysis of gender and instrumental cultural capital suggest this possibility. Women declared significantly less computer experience, even within the ViTAL group itself. The male students in both groups also declared significantly more modem experience, as did the male ViTAL students compared to the female ViTAL students. Female students were more likely to declare less computer comfort than male students, and this was also the case within the ViTAL group.

The female participants were just as likely to use computers as frequently as the male participants, but not modems. The frequency of computer use finding supports Pingree et al.'s (1996) finding that female participants used the CHESS system as much, if not slightly more than the males, but the modem finding contradicts it. Rogers' (1994) in Pingree et al. (1996) observation that females only constituted 30% of the population that accessed the PEN project system also supports the argument that modem technology may not be as diffused amongst the female population as widely as computer technology.

The female students in this study were not as computer literate as the male students, a finding which supports Conway's (1991) suggestion that in the AU population women do not adopt computer technology as readily and in as much depth as men. The results of this study suggest that women are somewhat

disadvantaged when it comes to adopting educational innovations using computer communications technology because they do not possess symbolic and instrumental cultural capital to the same extent as men, and they especially do not possess it as much when a technology is in its early stages. However, the fact that the ViTAL sub-sample was roughly representative of the AU student population indicates that even though the female ViTAL students possessed modems to a lesser extent and declared less instrumental cultural capital, gender may not be as great a barrier to studying by CMC as it has been in the past. The question becomes will women ever catch up, or will they always be at a disadvantage if more sophisticated technology is employed in distance education in the future?

Education. Those participants with a higher education level were more likely to possess symbolic cultural capital in the form of a computer at home. Interestingly, having a modem at home was not connected to having a higher education level. But having a modem at home was associated with having higher occupational status. This implies that though education appears to be directly related to adopting computer technology, it was only indirectly related, through occupational status, to adopting modem technology. This conclusion is supported by the literature on technological adoption (Dutton et al., 1987; Atkin & LaRose, 1994).

Possessing symbolic cultural capital, such as a computer and modem at home, is related to having higher socio-economic status. Having more symbolic cultural capital enables students to choose CMC. This adds evidence to the suggestion made earlier that lower education levels and lower occupational status are possible barriers to accessing CMC.

Computer experience and frequency of modem use, two of the five aspects of instrumental cultural capital, were strongly associated with educational level and of which the ViTAL students declared more. Participants were most likely to have gained their computer experience through adult education or at work, implying that barriers to acquiring the instrumental cultural capital associated with choosing CMC may also be barriers to accessing adult education and employment which provide opportunities for gaining instrumental cultural capital. A higher education level was also a predictor of choosing CMC.

However, neither modem experience, frequency of computer use, or computer comfort were strongly associated with education level. At first glance, this is appears to be evidence against the conclusion that education is a source for or barrier to gaining the skills related to choosing CMC. However, higher occupational status was strongly related to declaring more modem experience. Occupations with higher status require higher educational qualification, and the participants were likely to have gained their modem experience at work; so, indirectly, instrumental cultural capital appears to be related to education.

Having higher occupational status was also strongly related to using a computer more frequently and declaring a higher level of computer comfort. The implication of these findings is that the kind of employment one has access to as a result of their work and education experience provides them with more or less chances to acquire instrumental cultural capital.

Occupational Status. Higher occupational status was significantly associated with having a modem at home and all the instrumental cultural capital variables

except Computer Experience, though the association was approaching significance. Again, it appears that occupational status provides students with the opportunity to acquire the skills required to access CMC, and higher occupational status was a predictor of choosing CMC implying that low occupational status may be a source of barriers to choosing CMC.

Geographical Location. There was not a significance difference between rural and urban students within the two groups, ViTAL and Homestudy, in terms of access to computer technology at home. This implies that rural students are not disadvantaged in acquiring the symbolic cultural capital necessary to choose CMC. And, the rural students were more likely to have a modem at home than urban students, further supporting this conclusion. These results contradict the concerns found in the literature reviewed that rural students do not have access to CMC as readily as their urban counterparts (Lauzon, 1991; Byers, 1996). The results support Rekkedal's (1990) findings that geographical location is not a barrier to enroling in CMC.

Urban students in this study were more likely to use modems more frequently than were rural students, to a degree approaching significance. This was the only instrumental cultural capital variable that related in a significant way with geographical location, implying that though rural students may use a modem less frequently, perhaps because of costs, they do not have significantly less instrumental cultural capital. Thus, the implication is that rural students do not face more barriers than urban students in acquiring the cultural capital necessary to access and study by CMC. As well, geographical location was not a predictor to

choosing CMC.

Of interest is the fact that none of the rural residents claimed farming as their occupation. This leaves the question open as to whether farmers are disadvantaged when it comes to accessing and studying by CMC. Farmers' occupational status is rated low in many occupational status classification scales, and it may follow that they would be disadvantaged in accessing CMC. As such, the results do not directly contradict Lauzon's (1991) conclusions that farmers may not be benefitting from CMC.

Age. Age did not relate to the possession of symbolic or instrumental cultural capital. The results contradict the concerns expressed in the literature reviewed about older students not having the skills to access CMC, or younger students not being able to afford the technology (Fage & Mills, 1996; Pingree et al. 1996). Therefore, according to this study's findings, age may not be a barrier to choosing CMC. Age was also not a likely predictor of choosing CMC, supporting this conclusion further.

Income Level. Income level was not found in this study to be related to the possession of symbolic cultural capital, i.e. having a computer and modem at home. The implication of this result is that income may not be a barrier to acquiring CMC technology. This was not expected according to the theoretical bases of the study and some of the literature reviewed (Fage & Mills, 1996; Pingree et al., 1996). But, it may be explained by diffusion theory. The costs of computer and modem technology may no longer be prohibitive to the average student. The technologies have diffused to the extent where they are no longer a luxury item.

Income level was related to frequency of computer and modem use, but not to computer experience, modem experience and computer comfort. It is difficult to explain this result as education and occupation appear to be related to providing the opportunities to acquire the skills which predict the adoption of CMC as a learning media. And, income was a predictor for choosing CMC from the demographic data. It may be the long distance and server costs that prevent lower income modem users from using their modems as frequently as higher income students, but that does not explain the difference in computer use. Perhaps the occupations or unemployment of the low income students do not provide the opportunity for or necessity of using a computer as often. However, the conclusion is that income may not be a direct barrier to choosing CMC, but it is a factor in socio-economic status barriers.

Visible Minority Status. Those participants declaring visible minority status were not as likely to have a modem at home. This result is in accordance with the literature on the adoption of technology, innovative technologies are more likely to be adopted by whites. The fact that the participants declaring visible minority status were not disadvantaged in terms of having a computer at home implies that diffusion theory may accurately describe the adoption pattern of this technology. Personal computers have diffused into the population levelling the demographic variables involved in the early adopter stage. However, lack of access to modems still appears to be a barrier to accessing CMC.

None of the instrumental cultural capital variables were related to being in a visible minority group. This finding appears to contradict Harvey's argument that

racial groups are disadvantaged by the advent of the use of computer technology in education. It does not appear that the visible minority students in this study were unable to acquire instrumental cultural capital. However, only one of the ViTAL students declared visible minority status, and visible minority status was found to be a possible predictor of choosing CMC.

Summary. The ViTAL students in this study possessed more symbolic and instrumental cultural capital than did the Homestudy students. The major sources of their computer experience were adult education and work. The major sources of modem experience were self-teaching and work. The ViTAL students had more socio-economic status, meaning higher education level and occupational status. The implications, as Bourdieu would suggest, are that low socio-economic status may be a barrier to accessing CMC and that cultural capital can be acquired through educational and occupational opportunity. And, that this cultural capital can be converted to further educational and occupational opportunity.

Students with higher socio-economic status possessed cultural capital to a greater extent than do those with lower socio-economic status. It is this cultural capital that enables students to access CMC more readily. Students with more education, and higher occupational status and income levels, which are related in most cases, have greater opportunity to acquire valuable computer communication technology and the related skills and experience which enable them to access CMC with less effort and investment than those students without those skills and opportunities, and the confidence they may provide. The new form of cultural capital can be converted into educational opportunity, CMC.

Access to modems appears to be the major barrier to women and visible minorities accessing CMC at this time. This could be because modem technology has not diffused to the same extent as computer technology, as women and visible minorities were not disadvantaged in accessing a computer at home. Rural students were not disadvantaged in terms of possessing computers and modems at home, neither was any particular age group. Income was not related to the possession of symbolic cultural capital either.

The female students possessed less instrumental cultural capital than the males, even the ViTAL females possessed less than the ViTAL males. The students declaring visible minority status did not appear to be disadvantaged in the extent to which they possessed cultural capital, and neither did any particular age group. Rural students possessed similar amounts of cultural capital, except they did not use a modem as often. Income level only related to frequency of computer and modem use.

It was expected that socially disadvantaged groups would possess lower levels of cultural capital and therefore would be less likely to choose CMC. In this sample, though students with lower socio-economic status and women generally did have less symbolic and instrumental cultural capital, women were just as likely to choose CMC. And, though lower income students were not as likely to choose CMC, they did not possess much less cultural capital. Visible minorities were not as likely to choose CMC and did not possess that much less cultural capital either. Rural students were as likely to choose CMC, and they did not possess less cultural capital than urban students.

So, the question as to whether socially disadvantaged groups face equipment barriers in accessing CMC remains. The results imply that it is education and occupational status that provide access to computer and modem technology. In that socially disadvantaged groups often have lower education levels and lower occupational status, it can be said that they would experience more barriers to accessing the required CMC technology.

Is the lack of computer and modem skills a barrier to socially disadvantaged groups accessing CMC? Skill did not appear to be a barrier for visible minorities or students with low incomes as they had instrumental cultural capital, but they did not choose CMC. Females had less cultural capital, but were just as likely to choose CMC. The results are inconclusive for these groups, but as in the case of symbolic cultural capital, lower socio-economic status appears to be a barrier to acquiring instrumental cultural capital.

The implications of the results are that the major socio-economic barriers related to possession of cultural capital and choosing CMC appear to be education level and occupational status. They are more likely to be direct sources for acquiring cultural capital and for the existence of socio-economic barriers to accessing CMC rather than gender, geographical location, age, income, or visible minority status. It may be that women, particular age groups, low income groups and visible minorities do not have as much of the older forms of cultural capital, or they do not convert in the same way, and therefore have lower education levels and occupational status. A discussion of the probability of this relationship is beyond the scope of the study's focus, but a future study could investigate the possible barriers that are not directly

189

related to socio-economic status or the new form of cultural capital, but indirectly

through a lack of traditional forms of cultural capital or differential conversion rates.

Cultural Capital, Socio-economic Status, Familial Socio-economic Background, and Choosing CMC

As has been indicated by the results of the cultural capital and socio-

economic status analysis, ViTAL students, who had higher socio-economic status,

possessed cultural capital to a greater extent. That symbolic and instrumental

cultural capital enabled them to access CMC. Some of the instrumental cultural

capital was directly acquired through previous education and work. However, it was

expected that the cultural capital which may come from having higher socio-

economic status would also be "inherited" from the students' families. The

associations from this analysis were not statistically significant, but the trends that

were apparent were in the theoretically expected direction.

The trends follow from Bourdieu's (1977, 1986) concept of cultural capital and

his theory of social reproduction. Parents try to pass on the advantages they have or

wanted to have, like education, to their children to give them opportunities to acquire

more cultural capital. It was not expected that parents would necessarily pass on

computers and modems or computer communication skills to their children, but it

was expected that they would pass on an ethos, "a system of implicit and deeply

interiorized values which, among other things, helps to define attitudes toward

cultural capital and educational institutions" (Swartz, 1977, p.548) and traditional

forms of cultural capital, such as language skills and style. These resources would

190

encourage and enable their children to take advantage of the economic, cultural, and educational resources available to them in the belief that they would be able to reap the rewards of society. Having capital one can accumulate more capital, as in the capitalist economy. Persell and Cookson (1987) describe how elite boarding schools began to market themselves by selling parents on the computer learning opportunities they provided. With the help of the schools, the elite classes could afford their children the means to acquire new forms of cultural capital.

Bourdieu (1984) notes that not all parents have the economic and cultural means to afford their children the time and resources necessary to accumulate as much cultural capital as those in advantaged groups. So, it was expected that the possession of cultural capital would to some extent mediate the relationship between choosing CMC, level of socio-economic status, and level of family socio-economic status. This would mean that there would be a positive relationship between the participant choosing CMC, having higher socio-economic status, coming from a family with higher socio-economic status, and possessing higher levels of cultural capital. The results of the study clearly showed that the participants who chose ViTAL did have higher socio-economic status, and that they possessed cultural capital to a greater extent. It was not clear that there was a positive relationship between choosing CMC and coming from a family with higher socio-economic status, nor was it clear that there was a positive relationship between possessing high levels of cultural capital and coming from a family with higher socio-economic status.

The results from the analysis of the relationship between choosing CMC and

191

coming from a family with higher socio-economic status did not show a statistically significant association, but there is some evidence that Bourdieu's theory does apply. Those students who had mothers and fathers with more education, higher occupational status, and a higher income level were more likely to have a higher education level and more occupational status. These students were also more likely to have more cultural capital. The ViTAL students' fathers were more likely to have more education, higher occupational status, and a higher income level than the Homestudy students' fathers. Though the groups did not differ in terms of their mothers= education level, the ViTAL groups' mothers had higher occupational status and a higher income level. All but one of the associations, mother's education level, are in the expected direction though not statistically significant. The implication of these results is that the higher a participant's parents' socio-economic status, the higher his/her socio-economic status is likely to be, the more cultural capital he/she will possess, and the more likely it is that he/she will choose CMC.

Though the ViTAL and Homestudy students did not come from fundamentally different backgrounds, this does not necessarily discount the applicability of Bourdieu's theory of social reproduction through education for this study. Instead, this result may show that AU does not draw a great number of students from the least advantaged groups in Canada. If so, this in itself may be evidence that the distance education system is not benefitting the people who need it most as much as it is those who already have many advantages. The latter are able to take advantage of the opportunities the distance education system provides. As such, the distance education system may not be effectively changing the status quo; and,

perhaps, it is even reproducing it. Though the study did not compare the AU student population to student populations at other distance education institutions, it is plausible that AU, being the sole publicly funded Canadian university to deliver distance education exclusively, is representative of the distance education system in Canada.

The results of the background analysis show that the females that chose to study by CMC were more likely to have mothers with a higher education level and higher occupational status than were Homestudy females. The ViTAL females' socio-economic status seemed to be more related to their mothers= education levels and occupational status than to their fathers=, while the males' socio-economic status seemed more related to their fathers= education levels and occupational status, rather than their mothers=. And, the males' mothers in both groups were more likely to have a higher income, and the female students in both groups were more likely to have fathers with higher income levels.

Though none of the associations were significant, the trends in the results support the Persell et al. (1992) observations, which are based on Bourdieu's theory of the conversion of cultural capital, that females' educational attainment depends more on their families= socio-economic status than does males', and that there is growing evidence that mothers' characteristics may represent important educational resources for their daughters. The implications are that women who come from families with more socio-economic status and where the mothers have more education and higher occupational status are able to convert these resources into more educational opportunity, in this case choosing CMC. This finding differs from

the suggestion made by Persell and Cookson (1987) that computer competency may not be a class reproduction strategy for women, but the class of women they were studying was much higher than the one in this study.

The results suggest that women may need different background resources to attain the same rewards as men. This further makes the case that a student's socio-economic background is related to choosing CMC, especially in the case of women, but the nature of the relationship is very complex. There appears to be a need for further research on the kinds of barriers that women face in choosing CMC as opposed to men.

The results, on the whole, indicate that the possession of cultural capital as envisioned by the study and based on the work of Bourdieu and Persell and Cookson is not in itself a direct product of the socio-economic status of the family the participant was brought up in. It appears to be more likely that this new form of cultural capital may be accumulated directly through education and employment opportunity, and only indirectly by the acceptance of their parents' ethos, values and attitudes that encouraged the participant to pursue education as a way of acquiring the rewards of society, and the class habitus that gave them the confidence in their ability to do that. Hence, students who had acquired the new form of cultural capital may have been more likely to choose CMC because they had accumulated the technology and skills necessary to access it and perceived the rewards the accumulation could produce for them.

Education is one way to address social inequities, but delivering distance education by methods that require new forms of cultural capital which can only be

accumulated by education and/or employment opportunities, will create more barriers, technological and skill related, for those who are already educationally and economically disadvantaged. Those students who are able to access CMC will potentially have more interaction with their instructors, faster communications, and more feedback. They will receive the benefits of the CMC mode of delivery, while those without the necessary cultural capital will not.

Computer skills did seem to be related to choosing CMC. The ViTAL students possessed significantly more instrumental cultural capital than Homestudy students. Gender, age, geographical location, low income, and race are not in themselves barriers to acquiring the skills necessary to access CMC, but education level and occupational status appear to be. Those students with lower socio-economic status may eventually acquire more computer skills and equipment, but then it will be newer forms of cultural capital that they may lack.

Having older forms of cultural capital may make it more possible for students to acquire newer forms of cultural capital such as the one investigated in this study. More education and employment skills appear to have enabled the students to acquire computer communication technology and the ability to use it. As such the suggestion that the reproduction of the social structure continues through education appears likely. Cultural capital is the key to accessing education, and more education makes for more cultural capital accumulation.

With more cultural capital, one has more educational and occupational opportunities, and those opportunities offer further opportunities for gaining more cultural capital. Cultural capital can be converted into other forms of capital. It is

possible to see the logic of capital working in the reproduction of social inequities through the education system, and in this case the distance education system through the unequal opportunities to access and benefit from CMC.

The implications of the logic of cultural capital accumulation, as described above, for the delivery of distance education by CMC and future methods involving sophisticated technology is that decisions will have to be made by distance education institutions and educators. The decisions will involve value judgements about who the target populations are going to be, and what "effective" means. Rinne et al. (1993) concluded that the community college system in Norway serves the already advantaged, not those who need it most. It may do so effectively, but is that the purpose of the system? There appear to be barriers to CMC of a socio-economic nature which stem from a lack of cultural capital and the opportunities to acquire it. Offering courses by dual media, homestudy and CMC, serves the interests of a wider population. If this is deemed important by distance education institutions, it is because they have made a value judgement on the purpose of distance education, not a business decision, nor a decision driven by some notion of the "technological imperative".

Chapter Summary

The inducements for and barriers to choosing CMC are different in nature from those inducements for and to choosing homestudy. The implications of these results are that the ViTAL and Homestudy students differ in their interests, needs, personal situations, and in their ability to access computer communications

196

technology. Homestudy students choose homestudy out of necessity and for reasons of convenience, while CMC students study by CMC out interest. This fits with the idea that CMC is perceived as a more prestigious or socially valuable method of taking a course because of the luxury of it. It is a real choice, one not made of necessity. And, the technology and skills required to take a CMC course are scarcer and therefore more desirable and valuable than those required for homestudy.

The implications of the results pertaining to the first research question, What inducements and barriers do students give as reasons for their choice of delivery mode?, suggest that in order for distance education institutions to offer educational opportunity to students who are not able to choose CMC, whether due to their personal situations or lack of equipment, the institutions must continue to refine and offer homestudy as a mode of delivery, especially in the case of introductory and pre-requisite undergraduate courses.

As there will be a demand from the segment of the population who have an interest in innovative technology and its application in education, and the fact that there are pedagogical benefits in using CMC in distance education, it is important for distance education institutions to continue to develop and offer CMC as a mode of delivery. The majority of the present AU population will be served by continuing to offer undergraduate courses by dual media, CMC and homestudy. To meet the demands of equality of educational condition, those students who wish to take courses by CMC and do not have access to the required technology should have the opportunity to access the technology, whether through the development of a

197

student computer rental policy or some other form of subsidization offered by the distance education institution. As Wells (1991) significantly points out, CMC is different from other educational technologies in that the issue of who bears the primary responsibility for the technology seems to arise only with CMC.

As students become more familiar with distance education through taking homestudy courses, their experience may enable them to perceive the benefits of CMC and that may facilitate the effort and investment necessary to access it. The need for extensive technical support services is also implied by the results.

The results of the second research question, How do the two self-selected groups compare with each other in terms of demographic variables and selected variables, related in theory and practice, to the adoption of computer communications technology?, indicate that CMC students in comparison to Homestudy students typically have more previous education (some university education); have higher occupational status; do not declare visible minority status; have greater access to a computer and modem; have a higher income level; have more distance education experience; are somewhat older (average 33 years); and, are married with one child. ViTAL and Homestudy students are just as likely to be female, live in an urban area, and to be employed full-time.

Therefore the most likely predictors of choosing CMC are, according to the study's results, a higher education level, a higher income level, higher occupational status, not declaring visible minority status, being in a established family situation, having distance education experience, and having a computer and modem at home. As such, the CMC students are more likely to have higher socio-economic status

than Homestudy students, and are more likely to be adopters of innovative technology. The implications of the results are that socio-economic barriers to CMC are of real concern and that offering courses by CMC may benefit the already advantaged students in the distance education system, rather than the disadvantaged ones.

The results pertaining to the third research question, To what extent does cultural capital mediate the relationship between socio-economic status, socio-economic background, and choice of delivery mode? suggest that students with higher socio-economic status have more symbolic and instrumental cultural capital and are more likely to choose to study by CMC. The higher level of possession of cultural capital comes from education and occupational sources more than it does come directly from their family socio-economic background. However, the trends in the results show there may be some relationship between cultural capital level and family socio-economic background, but the survey methodology and instrument were not sensitive enough to investigate it in enough detail.

The ViTAL students, who already possessed higher educational qualifications and occupational status on average and thus possessed older forms of cultural capital, also possessed more of the new forms of cultural capital, computer equipment and skills. These results suggest that the Bourdieu and Persell and Cookson's theoretical base is appropriate for drawing conclusions about why some students are more prepared to choose CMC and the implications of using CMC in distance education. Because the ViTAL students had the necessary cultural capital they had the advantage of studying by CMC, thereby gaining a more "valuable"

educational experience, in the view of a technologically-oriented society. This experience may convert into greater opportunities for economic and social gains.

If this scenario is accurate, then technological and educational innovations may indeed be compatible with profound and enduring stability in the social structure. The distance education system, using sophisticated computer technology to pursue the "virtual classroom," may create more barriers to education for those already lacking traditional forms of cultural capital and therefore the newer ones in that they can be accumulated more readily by the possession of the older forms. The "virtual classroom" as it stands is more accessible to those students who possess more socio-economic status and more symbolic and instrumental cultural capital. As such, the inequities in opportunities experienced by students with lower socio-economic status will be reproduced because they have less cultural capital to use to obtain valuable educational skills and qualifications.

Even if, or when, the virtual classroom does become open to all, the scarcity value of CMC will have been lowered, as it will have become common and therefore devalued. By then, a newer form of the virtual classroom may already exist that will be a more Aeffective@ way of delivering education, but which will require more resources and other forms of cultural capital. Then it will be more desirable and probably more beneficial for the student. The less advantaged will be one step behind, gaining less value for their educational qualifications and experiencing different learning conditions. As Bourdieu states, "In short, what the competitive struggle makes everlasting is not different conditions, but differences in condition" (1984, p. 164). But, there is no guarantee that the technology required to study by

200

CMC will ever diffuse to the point where it is available to all prospective students. And, CMC as an educational innovation may not be even be adopted by the majority of distance education students.

At present, some students may not perceive the rewards for acquiring the skills and equipment required to access CMC as worth the costs and time required if computer technology is not relevant to their life experiences. If socio-economic and equipment barriers to accessing CMC and future educational innovations using innovative technologies are not addressed, the gap between the "haves" and "have nots" will continue indefinitely. Those students who have greater resources to adopt the technological innovations used in distance education will always gain advantage in the education system and employment market because they will have the rewards from it first, when they have scarcity value.

Therefore, the primary issue for distance educators and institutions in terms of this study's conclusions is to implement the use of CMC in undergraduate programs in such a way that it does not advantage some students while potentially disadvantaging others. Historically, the reason for the development of distance education systems was to provide for the educational needs of students who could not attend traditional institutions. The mission was to provide educational opportunity to those who needed it.

In light of the results of the study, that CMC and homestudy meet the needs of different groups of students, it is recommended that distance education institutions offer their introductory and pre-requisite undergraduate courses by dual media, CMC and homestudy. Further to this, so as to promote equality of condition,

the institutions should develop and implement policies to provide students wishing to study by CMC and who do not have the required equipment and skills with the opportunity to acquire them without financial hardship. If these two conditions are met, the implementation of CMC will not further disadvantage those students lacking the new forms of cultural capital, avoiding widening the gap between the "haves" and "have nots". To support the implementation of CMC in undergraduate classes, more active promotion of CMC to prospective students should be a focus of the institution. It was clear from this study's results that a significant portion of the student population did not understand what CMC was about. Technical support services should be continued and expanded with demand for them.

Conclusions

The following conclusions are based on the findings of the study:

1. The ViTAL students registered in CMC for different reasons than the Homestudy students registered in correspondence; the two groups had different needs.

2. Perceived pedagogical benefits and an interest in the nature and technology of CMC were the inducements for studying by CMC, while flexibility and convenience were the inducements for studying by correspondence. The perceived prestige levels of either mode of delivery were apparently not inducements.

3. The majority of ViTAL students did not register in homestudy because they were interested in CMC. The Homestudy students did not register in CMC because of a lack of equipment, their personal situations, or not knowing about the choice.

4. The major barrier to enroling in CMC experienced by the ViTAL students was the

length of time required for set up because of technical difficulties. The major barriers to enroling in correspondence encountered by the Homestudy students were that they required more motivation, a lack of sufficient interaction with the instructor, and that it was too easy to fall behind.

5. The predictors of choosing CMC were: a higher education level, a higher income level, higher occupational status, not declaring visible minority status, being in a established family situation, having distance education experience, and having a computer and modem at home.

6. Higher socio-economic status was directly related to registering in CMC, and therefore low socio-economic status was a potential barrier to choosing CMC.

7. The homestudy and ViTAL students came from fundamentally the same socio-economic background, and therefore socio-economic background did not appear to be a significant factor in registering in CMC.

8. The construct of cultural capital derived from Bourdieu (1986) and Persell and Cookson (1987) was useful in measuring the extent to which the students possessed CMC technology and skills.

9. The possession of symbolic and instrumental cultural capital was related to choosing CMC, and therefore a lack of cultural capital was a potential barrier to choosing CMC.

10. The possession of symbolic and instrumental cultural capital was related to higher socio-economic status.

11. The sources for acquiring symbolic and instrumental cultural capital were likely to be education and work.

12. Symbolic and instrumental cultural capital were not directly acquired from familial socio-economic background.

13. Women did not have the same level of comfort with computers and were less likely than men to rate themselves as highly computer literate.

14. Low socio-economic status and lack of cultural capital were more likely to be barriers to accessing CMC than gender, geographic location, age, employment status, low income, or race were by themselves.

15. Bourdieu's theory of cultural capital and social reproduction (1977, 1984, 1986) provides a view of the social function of the distance education system which indicates that in implementing sophisticated technology in its course delivery it may reward students with more symbolic and instrumental cultural capital, and disadvantage those without it. The system may act as a conservative force.

<div align="center">Recommendations</div>

Recommendation 1: Distance education institutions offer introductory and pre-requisite undergraduate courses by dual medium delivery, correspondence and CMC.

Historically, the reason for the development of distance education systems was to provide for the educational needs of students who could not attend traditional institutions. The mission was to provide educational opportunity to those who needed it. In light of the results of the study, that CMC and homestudy meet the needs of different groups of students, not providing both delivery options will not serve the interests of the majority of the current undergraduate student population

and will seriously disadvantage some students.

Recommendation 2: Distance education institutions offering dual medium delivery of undergraduate courses develop and implement policies to promote equal access to the CMC delivery mode.

So as to promote equality of condition, students wishing to study by CMC and who do not have the required equipment and skills should be provided with the opportunity to acquire them without financial hardship.

Recommendation 3: Distance education institutions actively promote CMC, outlining the potential pedagogical benefits of the mode of delivery.

To support the implementation of CMC in undergraduate classes, more active promotion of CMC to prospective students should be a focus of distance education institutions. It was clear from the study's results that a significant portion of the student population did not understand what CMC was about, or even that it was an option. Student information and counselling services should be provided with the necessary information and training to promote CMC. Calendars should be reviewed to be sure they clearly present students with enough information to understand their options.

Recommendation 4: Easily accessed and effective technical support services be available.

Technical support services should be easily accessible at a wide variety of times, and the extent of them should be expanded with demand. A review of the student satisfaction with the technical support services performance and hours of availability should take place regularly.

Recommendation 5: Systematic monitoring of student populations be carried out.

The collection of student demographic data across modes and courses would enable distance education institutions to understand and meet the needs of various target groups more effectively. With this kind of information, decisions on educational technology selection and resource allocation could be made to serve the interests of the current student population and perhaps even show the way to expanding the population.

Suggestions for Further Research

1. It is recommended, for future studies similar to this one, that two courses offered by the correspondence and CMC modes of delivery from very different disciplines be compared. As such, the sample size would need to be increased. It is recommended that the sample consist of 100 participants or more, at least 50 participants in both the Homestudy and ViTAL sub-samples, 25 from each course of study.

2. To provide more detailed data on the perceptions of students on the inducements for and barriers to studying by CMC, their socio-economic backgrounds, the extent to which they possess cultural capital, and the relationship between older and the new form of cultural capital, the method of in-depth in-person interviews would be appropriate. This research would allow for a more extensive examination of the possible relationships between socio-economic status and background, and between the possession of the traditional forms and the new form of cultural capital as they relate to a student choosing CMC or homestudy.

3. Sampling a more diverse population may give distance educators more understanding of the barriers socially disadvantaged groups may encounter.

4. As the results were contradictory in terms of whether there are barriers facing women, visible minorities, and students with low incomes in accessing CMC, it is recommended that further research be done in this area.

5. It is recommended that further research be carried out on the diffusion of computer communications technology and skills, for instance a study investigating the ratio of Homestudy and ViTAL students in AU's Accounting 253 in the future concentrating on access to computers and modems, socio-economic status, other predictors of technological adoption, and computer literacy. The research may better answer the question as to whether CMC is following the standard diffusion pattern of technological innovations.

6. In order to further research the question of whether computer literacy is a new form of cultural capital, as conceived of by Persell and Cookson (1987) and based on the logic of cultural capital theorized by Bourdieu (1977, 1984, 1986), the educational attainment and occupational status of the children now growing up with computers at home and computer literate parents from which to "inherit" this cultural capital could be compared to those children of the same cohort who grew up without as much access to computer technology and computer literate parents.

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APPENDIX C

Chapter Four Tables

This appendix includes the following tables:

Page

Table C1

Reasons ViTAL Students Gave for Registering in ViTAL

#	Response	Frequency of Response	% of Total Responses	% of n

_____

#	Response	Frequency of Response	% of Total Responses	% of n
5.19	Other: Faster communications	21	27%	74%
5.14	Can learn CMC skills	9	12%	31%
5.2	More interaction with instructor	8	10%	28%
5.9	Like computers	6	8%	21%
5.5	Less work	5	7%	17%
5.8	Comfortable working with computers	4	5%	14%
5.13	Good for future job needs	4	5%	14%
5.6	More interaction with peers	3	4%	10%
5.12	Have access to technology	3	4%	10%
5.20	Less paper	3	4%	10%
5.1	Positive previous experience	2	3%	7%
5.16	Experience with computers	2	3%	7%
5.17	Experience on-line	2	3%	7%
5.4	More motivating to use computers	1	1%	3%
5.7	Suits learning style	1	1%	3%
5.10	Like being on-line	1	1%	3%
5.11	Technical support at home	1	1%	3%
5.15	Have CMC skills already	1	1%	3%
		---	----	
	Total	77	100 %	

Table C2

Reasons Homestudy Students Gave for Registering in Homestudy

#	Response	Frequency of Response	% of Total Responses	% of n

_____

6.9	Can work at home or anywhere	16	32%	55%
6.10	Only option given the circumstances	12	24%	41%
6.16	Self-pacing	8	16%	28%
6.20	Other: 1) young kids at home	4	8%	14%
6.4	Independence of homestudy	3	6%	10%
6.19	No extra costs	2	4%	7%
6.20	2) works in job situation	2	4%	7%
6.3	Easy way to take a course	1	2%	3%
6.7	Suits learning style	1	2%	3%
6.15	Telephone tutor support	1	2%	3%
		--	---	
	Total	50	100%	

Table C3

Prestige Level Ratings of Homestudy by Mode of Delivery

Mode of Delivery

_____

Prestige of Homestudy	Homestudy	ViTAL	n
Rating 1-3 Low	2 (7%)	7 (24%)	9 (16%)
Rating 4-6 Middle	11 (41%)	15 (52%)	26 (46%)
Rating 7-10 High	14 (52%)	7 (24%)	21 (38%)
Total	27 (100%)	29 (100%)	56 (100%)

Note. Prestige ratings were given on a scale from one to ten where one meant very low and ten meant very high. Two missin values were a result of two homestudy students expressing their inability to give a prestige rating.

Table C4

Prestige Level Ratings of VITAL by Mode of Delivery

	Mode of Delivery		
Prestige of ViTAL	Homestudy	ViTAL	n
Rating 1-3 Low	1 (10%)	2 (7%)	3 (8%)
Rating 4-6 Middle	1 (10%)	11 (41%)	12 (32%)
Rating 7-10 High	8 (80%)	14 (52%)	22 (60%)
Total	10 (100%)	27 (100%)	37 (100%)
Missing values	19 (66%)	2 (7%)	21 (36%)

Note. Prestige ratings were given on a scale from one to ten where one meant very low and ten meant very high. Missing values were due to 21 students expressing their inability to give a rating.

Table C5

Barriers ViTAL Students Encountered In Registering For ViTAL

#	Response	Frequency of Response	% of Total Responses	% of n

#	Response	Frequency	% of Total	% of n
5a.1	None	16	43%	52%
5a.23	Set up time required	10	27%	35%
5a.11	No access to modem at home	2	5%	7%
5a.14	No ISP connection	2	5%	7%
5a.24	Complexity of applying	2	5%	7%
5a.29	Other: Overseas set up	2	5%	7%
5a.12	No access to computer at home	1	3%	3%
5a.13	No ISP node in location	1	3%	3%
5a.10	Doesn't suit learning style	1	3%	3%
		---	---	
	Total	37	100%	

Table C6

ViTAL Students' Reasons for Not Registering in Homestudy

#	Response	Frequency of Response	% of Total Responses	% of n

#	Response	Frequency of Response	% of Total Responses	% of n
5b.2	Wanted to learn by CMC	15	43%	52%
5b.1	No reason	8	23%	28%
5b.19	Poor postal service	3	9%	10%
5b.27	Other: 1) Tutor response time	2	6%	7%
	2) Abroad	2	6%	7%
5b.4	Restricted interaction with instructor	1	3%	3%
5b.10	Not enough organization and structure	1	3%	3%
5b.14	Doesn't suit learning style	1	3%	3%
5b.16	Family responsibil-ities	1	3%	3%
5b.26	Didn't know about choice	1	3%	3%
	Total	-- 35	--- 100%	

Table C7

Barriers Homestudy Students Encountered in Registering for Homestudy

#	Response	Frequency of Response	% of Total Responses	% of n
6a.1	None	10	26%	35%

6a.7	Requires greater motivation	5	13%	17%
6a.3	Restricted interaction with instructor	4	10%	14%
6a.11	Too easy to fall behind	4	10%	14%
6a.13	Doesn't suit learning style	3	8%	10%
6a.26	Other: 1)problems at home or work causing stress	3	8%	10%
6a.20	Lack of time management skills	2	5%	7%
6a.14	Lack of interaction with peers	2	5%	7%
6a.15	Family responsibilities	2	5%	7%
6a.2	Negative previous experience	1	3%	3%
6a.5	Anxiety about success in correspondence	1	3%	3%
6a.18	Poor postal service	1	3%	3%
6a.24	Complexity of applying	1	3%	3%
	Total	39	100%	

Table C8

Reasons Homestudy Students Gave for Not Registering in ViTAL

#	Response	Frequency of Response	% of Total Responses	% of n
6b.13	No access to computer	11	29%	40%

6b.26	Didn't know about choice	8	21%	28%
6b.12	No access to modem	7	18%	24%
6b.15	No ISP connection	5	13%	17%
6b.2	Wanted to take it by homestudy	2	5%	7%
6b.23	Major equipment upgrading required	2	5%	7%
6b.1	No reason	1	3%	3%
6b.18	Lack of computer skills	1	3%	3%
6b.22	No experience with CMC	1	3%	3%
	Total	38	100%	

Table C9

Geographical Location According to Mode of Delivery

	Mode of Delivery		
Geographical Location	ViTAL	Homestudy	n
Urban	23 (79%)	19 (66%)	42 (72%)

226

Rural   6 (21%)   10 (34%)   16 (28%)

Total   29 (100%)   29 (100%)   58 (100%)
_____

Table C10

Age According to Mode of Delivery and Gender

		Age			
Mode	Gender	M	Mdn	SD	n
ViTAL					
	Male	33.6	33.0	8.16	7
	Female	33.0	32.5	6.53	22
Homestudy					
	Male	27.5	26.5	4.99	8
	Female	31.6	32.0	8.74	21
Entire Population					
	Male	30.3	29.0	7.12	15
	Female	32.3	32.0	7.62	43

Note. Age cited in years.

Table C11

Employment Status According to Mode of Delivery

	Mode of Delivery		
Employment Status	ViTAL	Homestudy	n
Unemployed	6 (21%)	7 (24%)	13 (22%)

227

Part-time	5 (17%)	7 (24%)	12 (21%)
Full-time	18 (62%)	15 (52%)	33 (57%)
Total	29 (100%)	29 (100%)	58 (100%)

Note. Homemakers and full-time students not working otherwise were considered unemployed for the purposes of the study.

Table C12

Mode of Delivery and Gender According to Mother's Education Level

	Mother's Education					
Group	High Sch	Voc/tech Some Uni	Bach	DK	Total	
ViTAL	16 (44%)	8 (73%)	0 (0%)	3 (60%)	2 (40%)	29(50%)
Male	4 (25%)	2 (25%)	0 (0%)	0 (0%)	1 (50%)	7(24%)
Female	12 (75%)	6 (75%)	0 (0%)	3 (100%)	1 (50%)	22(76%)
Homestudy	20 (56%)	3 (27%)	1 (100%)	2 (40%)	3 (60%)	29(50%)
Male	5 (25%)	0 (0%)	0 (0%)	2 (100%)	1 (33%)	8(28%)
Female	15 (75%)	3 (100%)	1 (100%)	0 (0%)	2 (67%)	21(72%)
Population	36 (100%)	11 (100%)	1 (100%)	5 (100%)	5 (100%)	58(100)
Male	9 (25%)	2 (18%)	0 (0%)	2 (60%)	2 (60%)	15(26%)
Female	27 (75%)	9 (82%)	1 (100%)	3 (40%)	3 (40%)	43(74%)

Note. DK means the students did not know their mother's education level.

Table C13

Education Level By Mother's Education Level

	Mother's Education					
Education	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
High Sch or Less	6 (17%)	2 (18%)	0 (0%)	0 (0%)	1 (20%)	9 (16%)
Voc/Tech	6 (17%)	3 (27%)	0 (0%)	1 (20%)	0 (0%)	10(17%)

	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
Cert						
Some Uni	18 (50%)	5 (46%)	1 (100%)	1 (20%)	3 (60%)	28(48%)
Bachelor or Better	6 (17%)	1 (9%)	0 (0%)	3 (40%)	1 (20%)	11(19%)
Total	36 (100%)	11 (100%)	1 (100%)	5(100%)	5(100%)	58(100%)

Note. DK means the students did not know their mother's education level.

Table C14

Occupational Status By Mother's Education Level

	Mother's Education					
Occupat Status	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
High Man/ Pro	1 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)
Mid-man/ Semi-pro	9 (25%)	5 (45%)	0 (0%)	1 (20%)	3 (60%)	18 (31%)
Skilled	15 (42%)	3 (27%)	0 (0%)	4 (80%)	1 (20%)	23 (40%)
Unskill	11 (31%)	3 (27%)	1 (100%)	0 (0%)	1 (20%)	16 (28%)
Total	36 (100%)	11 (100%)	1 (2%)	5 (100%)	5 (100%)	58 (100%)

Note. DK means the students did not know their mother's education level.

Table C15

Mode of Delivery and Gender By Mother's Occupational Status

	Mother's Occupational Status					
Group	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
ViTAL	4 (67%)	4 (80%)	8 (53%)	13 (42%)	0 (0%)	29 (50%)
Male	1 (25%)	1 (25%)	1 (13%)	4 (31%)	0 (0%)	7 (24%)
Female	3 (75%)	3 (75%)	7 (88%)	9 (69%)	0 (0%)	22 (76%)

	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
Homestudy	2 (33%)	1 (20%)	7 (47%)	18 (58%)	1 (3%)	29 (50%)
Male	2 (100%)	0 (0%)	1 (14%)	5 (28%)	0 (0%)	8 (28%)
Female	0 (0%)	1 (100%)	6 (86%)	13 (72%)	1 (100%)	21(72%)
Population	6 (100%)	5 (100%)	15 (100%)	31 (100%)	1 (2%)	58(100%)
Male	3 (20%)	1 (7%)	2 (13%)	9 (60%)	0 (0%)	15(26%)
Female	3 (7%)	4 (9%)	13 (30%)	22 (51%)	1 (2%)	43(74%)

Table C16

Education Level By Mother's Occupational Status

Education	Mother's Occupational Status					
	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
High Sch or Less	1 (17%)	1 (20%)	1 (7%)	5 (16%)	1 (100%)	9(16%)
Voc/Tech Cert	0 (0%)	2 (40%)	4 (27%)	4 (13%)	0 (0%)	10(17%)
Some Uni	2 (33%)	2 (40%)	9 (60%)	15 (48%)	0 (0%)	28 (48%)
Bachelor or Better	3 (50%)	0 (0%)	1 (7%)	7 (23%)	0 (0%)	11 (19%)
Total	6 (100%)	5 (100%)	15 (100%)	31 (100%)	1(100%)	58(100%)

Table C17

Occupational Status By Mother's Occupational Status

Occupat Status	Mother's Occupational Status					
	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
High Man/ Pro	0 (0%)	0 (0%)	0 (0%)	1 (3%)	0 (0%)	1 (2%)
Mid-man/ Semi-pro	2 (33%)	2 (40%)	4 (27%)	9 (29%)	1 (100%)	18 (31%)

230

	<$20,000	$20-29	$30-39	>$40,000	DK	Total
Skilled	4 (67%)	3 (60%)	7 (47%)	9 (29%)	0 (0%)	23 (40%)
Unskill	0 (0%)	0 (0%)	4 (27%)	12 (39%)	0 (0%)	16 (27%)
Total	6 (100%)	5 (100%)	15 (100%)	31 (100%)	1(100%)	58(100%)

Table C18

Mode of Delivery and Gender By Mother's Income Level

	Mother's Income					
Groups	<$20,000	$20-29	$30-39	>$40,000	DK	Total
ViTAL	12 (50%)	3 (60%)	1 (25%)	4 (100%)	9 (31%)	28(49%)
Male	3 (43%)	0 (0)%	0 (0%)	2 (29%)	2 (29%)	7 (25%)
Female	9 (41%)	3 (14%)	1 (5%)	2 (9%)	7 (32%)	22(75%)
Homestudy	12 (50%)	2 (40%)	3 (75%)	0 (0%)	11(39%)	29(51%)
Male	3 (38%)	0 (0%)	1 (13%)	0 (0%)	4 (50%)	8(28%)
Female	9 (45%)	2 (10%)	2 (10%)	0 (0%)	7 (35%)	21(72%)
Population	24 (100%)	5 (100%)	4 (100%)	4 (100%)	20(100%)	7(100%)
Male	6 (40%)	0 (0%)	1 (7%)	2 (13%)	6 (40%)	15 (26%)
Female	18(43%)	5 (12%)	3 (7%)	2 (5%)	14(33%)	42 (74%)

Note. DK means the students did not know their mother's income level. The missing value is due to one student declining to answer the survey question about mother's income.

Table C19

Education Level By Mother's Income Level

	Mother's Income					
Education	<$20,000	$20-29	$30-39	>$40,000	DK	Total
High Sch or Less	4 (17%)	1 (20%)	1 (25%)	0 (0%)	3 (15%)	9(16%)
Voc/Tech Cert	4 (17%)	1 (20%)	1 (25%)	1 (25%)	2 (10%)	9(16%)
Some Uni	10 (42%)	2 (40%)	1 (25%)	3 (75%)	12 (60%)	28(49%)

	<$20,000	$20-29	$30-39	>$40,000	DK	Total
Bachelor or Better	6 (25%)	1 (20%)	1 (25%)	0 (0%)	3 (15%)	11(19%)
Total	24 (100%)	5 (100%)	4 (100%)	4 (100%)	20(100%)	57(100%)

Note. DK means the students did not know their mother's income level. The missing value was a result of one student declining to answer the question about mother's income.

Table C20

Occupational Status By Mother's Income Level

	Mother's Income					
Occupat Status	<$20,000	$20-29	$30-39	>$40,000	DK	Total
High Man/ Pro	1 (4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1(2%)
Mid-man/ Semi-pro	8 (33%)	0 (0%)	2 (50%)	4 (100%)	4 (20%)	18(32%)
Skilled	9 (38%)	3 (60%)	1 (25%)	0 (0%)	9 (45%)	22(39%)
Unskill	6 (25%)	2 (40%)	1 (25%)	0 (0%)	7 (35%)	16(28%)
Total	24 (100%)	5 (100%)	4 (100%)	4 (100%)	20(100%)	57(100%)

Note. DK means the students did not know their mother's income level. The missing value was a result of one student declining to answer the question about mother's income.

Table C21

Mode of Delivery and Gender By Father's Education Level

	Father's Education					
Groups	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
ViTAL	15 (47%)	7 (64%)	2 (67%)	5 (50%)	0 (0%)	29(50%)
Male	4 (57%)	1 (14%)	0 (0%)	2 (29%)	0 (0%)	7 (24%)
Female	11 (54%)	6 (27%)	2 (9%)	3 (14%)	0 (0%)	22 (76%)
Homestudy	17 (53%)	4 (36%)	1 (33%)	5 (50%)	2 (100%)	29 (50%)
Male	4 (50%)	0 (0%)	1 (13%)	3 (38%)	0 (0%)	8 (28%)

	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
Female	13 (62%)	4 (19%)	0 (0%)	2 (10%)	2 (100%)	21(72%)
Population	32 (100%)	11 (100%)	3 (100%)	10 (100%)	2 (100%)	58(100%)
Male	8 (49%)	1 (7%)	1 (7%)	5 (33%)	0 (0%)	15 (26%)
Female	24 (56%)	10 (23%)	2 (5%)	5 (12%)	2 (5%)	41(74%)

Note. DK means the students did not know their father's education level.

Table C22

Education Level By Father's Education Level

	Father's Education					
Education	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
High Sch or Less	7 (22%)	1 (9%)	0 (0%)	0 (0%)	1 (50%)	9 (16%)
Voc/Tech Cert	4 (13%)	3 (28%)	1 (33%)	1 (10%)	1 (50%)	10 (17%)
Some Uni	14 (44%)	7 (64%)	2 (67%)	5 (50%)	0 (0%)	28 (48%)
Bachelor or Better	7 (22%)	0 (0%)	0 (0%)	4 (40%)	0 (0%)	11(19%)
Total	32 (100%)	11 (100%)	3 (100%)	10 (100%)	2 (100%)	58(100%)

Note. DK means the students did not know their father's education level.

Table C23

Occupational Status By Father's Education Level

	Father's Education					
Occupat Status	High Sch	Voc/Tech	Some Uni	Bach	DK	Total
High Man/ Pro	0 (0%)	0 (0%)	1 (33%)	0 (0%)	0 (0%)	1 (2%)
Mid-man/ Semi-pro	11 (34%)	1 (9%)	2 (67%)	4 (40%)	0 (0%)	18(31%)
Skilled	11 (34%)	6 (55%)	0 (0%)	5 (50%)	1 (50%)	23(40%)

Unskilled	10 (32%)	4 (36%)	0 (0%)	1 (10%)	1 (50%)	16(28%)
Total	32 (100%)	11 (100%)	3 (100%)	10 (100%)	2(100%)	58(100%)

Note. DK means the students did not know their father's education level.

Table C24

Mode of Delivery and Gender By Father's Occupational Status

	Father's Occupational Status					
Group	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
ViTAL	5 (56%)	6 (86%)	8 (38%)	4 (31%)	6 (75%)	29(50%)
Male	1 (14%)	3 (43%)	1 (14%)	2 (29%)	0 (0)	7 (24%)
Female	4 (18%)	3 (14%)	7 (32%)	2 (9%)	6 (27%)	22 (76%)
Homestudy	4 (44%)	1 (14%)	13 (62%)	9 (69%)	2 (25%)	29 (50%)
Male	3 (38%)	0 (0%)	4 (50%)	1 (13%)	0 (0%)	8 (28%)
Female	1 (5%)	1 (5%)	9 (43%)	8 (38%)	2(10%)	21(72%)
Population	9 (100%)	7 (100%)	21 (100%)	13 (100%)	8 (100%)	58(100%)
Male	4 (27%)	3 (20%)	5 (33%)	3 (20%)	0 (0%)	15 (26%)
Female	5 (12%)	4 (9%)	16 (37%)	10 (23%)	8 (19%)	43 (74%)

Table C25

Education Level By Father's Occupational Status

	Father's Occupational Status					
Education	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
High Sch or Less	0 (0%)	1 (14%)	0 (0%)	6 (46%)	2 (25%)	9 (16%)
Voc/Tech Cert	2 (22%)	1 (14%)	5 (24%)	2 (15%)	0 (0%)	10(17%)
Some Uni	3 (33%)	5 (71%)	11 (52%)	3 (23%)	6 (75%)	28(48%)
Bachelor or Better	4 (44%)	0 (0%)	5 (24%)	2 (15%)	0 (0%)	11(19%)

Total	9 (100%)	7 (100%)	21 (100%)	13 (100%)	8 (100%) 58(100%)

Table C26

Occupational Status By Father's Occupational Status

Occupat Status	Father's Occupational Status					
	High/Pro	Mid/Semi	Skilled	Unskilled	Farm	Total
High Man/ Pro (2%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)	1
Mid-man/ Semi-pro	4 (44%)	3 (43%)	4 (19%)	3 (23%)	4 (50%)	18(31%)
Skilled	5 (56%)	2 (29%)	9 (43%)	5 (38%)	2 (25%)	23(40%)
Unskill	0 (0%)	2 (29%)	7 (33%)	5 (38%)	2 (25%)	16(28%)
Total	9 (100%)	7 (100%)	21 (100%)	13 (100%)	8 (100%)	58(100%)

Table C27

Mode of Delivery and Gender By Father's Income Level

Groups	Father's Income					
	<$20,000	$20-29	$30-39	$>40,000	DK	Total
ViTAL	0 (0%)	0 (0%)	2 (25%)	10 (63%)	16 (55%)	28(50%)
Male	0 (0%)	0 (0%)	0 (0%)	3 (43%)	4 (57%)	7 (25%)
Female	0 (0%)	0 (0%)	2 (10%)	7 (33%)	12 (57%)	21(75%)
Homestudy	1 (100%)	2 (100%)	6 (75%)	6 (37%)	13 (45%)	28(50%)
Male	1 (13%)	1 (13%)	0 (0%)	1 (13%)	5 (63%)	8 (29%)
Female	0 (0%)	1 (5%)	6 (30%)	5 (25%)	8 (40%)	20 (71%)

	<$20,000	$20-29	$30-39	$>40,000	DK	Total
Population	1 (100%)	2 (100%)	8 (100%)	16 (100%)	29(100%)	56(100%)
Male	1 (7%)	1 (7%)	0 (0%)	4 (27%)	9 (60%)	15 (27%)
Female	0 (0%)	1 (2%)	8 (20%)	12 (29%)	20 (49%)	41 (73%)

Note. DK means the students did not know their father's income level. The two missing values were due to two students declining to answer to the survey question about their father's income.

Table C28

Education Level By Father's Income Level

Father's Income

Education	<$20,000	$20-29	$30-39	$>40,000	DK	Total
High Sch or Less	0 (0%)	0 (0%)	3 (38%)	1 (7%)	5 (17%)	9 (16%)
Voc/Tech Cert	0 (0%)	1 (50%)	4 (50%)	1 (7%)	2 (7%)	8 (14%)
Some Uni	0 (0%)	1 (50%)	0 (0%)	10 (63%)	17(59%)	28(50%)
Bachelor or Better	1 (100%)	0 (0%)	1 (13%)	4 (25%)	5 (17%)	11(20%)

236

Total	1 (100%)	2 (100%)	8 (100%)	16 (100%)	29(100%) 56(100%)

Note. DK means that the students did not know their father's income level. The two missing values were due to two students declining to answer the survey question about father's income.

Table C29

Occupational Status By Father's Income Level

Occupat Status ————————	Father's Income					
	<$20,000	$20-29	$30-39	$>40,000	DK	Total
High Man/ Pro	0 (0%)	1 (50%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)
Mid-man/ Semi-pro	0 (0%)	0 (0%)	2 (25%)	5 (31%)	11 (38%)	18(32%)
Skilled	0 (0%)	1 (50%)	5 (63%)	7 (44%)	8 (28%)	21(38%)
Unskilled	1 (100%)	0 (0%)	1 (13%)	4 (25%)	10(35%)	16(29%)
Total	1 (100%)	2 (100%)	8 (100%)	16 (100%)	29(100%)	56(100%)

Note. DK means that the students did not know their father's income level. The two missing values were due to two students declining to answer the survey question about father's income.
Table C30

Knowing About Modem According to Mode of Delivery

Know About Modem —————————	Mode of Delivery		
	ViTAL	Homestudy	Total
Yes	20 (67%)	4 (37%)	24 (60%)
No	9 (33%)	7 (63%)	16 (40%)
Total	29 (100%)	11 (100%)	40 (100%)

Table C31

Group	Frequency of Modem Use			
	M	Mdn	SD	Total
ViTAL				
Male	5.9	6.0	.378	7
Female	5.6	6.0	.790	22
Total	5.7	6.0	.712	29

Note. The students declared the frequency with which they used modems on a scale from one to six, where one meant hardly ever and six meant almost everyday.

Table C32

Symbolic Cultural Capital By Mother's Education Level

Cultural Capital	Mother's Education Level					
	High Sch	Voc/Tech	Some Uni	Bach>	DK	Total
Computer at Home						
Yes	28 (78%)	9 (82%)	1 (100%)	4 (80%)	4 (80%)	46 (79%)
No	8 (22%)	2 (18%)	0 (0%)	1 (20%)	1 (20%)	12 (21%)
Modem at Home						
Yes	23 (64%)	9 (82%)	0 (0%)	4 (80%)	3 (60%)	40 (69%)
No	13 (36%)	2 (18%)	1 (100%)	1 (20%)	2 (40%)	18 (31%)

| Total | 36 (100%) | 11(100%) | 1 (100%) | 5 (100%) | 5(100%) | 58(100%) |

Note. DK means that the students did not know their mother's education level.

Table C33

Instrumental Cultural Capital By Mother's Education Level

		Mother's Education Level					
Cultural Capital	High Sch n = 36	Voc/Tech n = 11	Some Uni n = 1	Bach > n = 5	DK n = 5	n
ComExp M	6.0	6.2	7.0	8.8	5.6	58
SD	2.39	2.56	.	1.30	2.97	
Mo Exp M	4.2	5.6	6.0	6.6	3.8	58
SD	2.77	3.08	.	3.36	3.35	
ComFre M	5.2	5.6	6.0	6.6	4.8	58
SD	1.39	1.21	.	.447	2.17	
MoFreq M	3.7	4.6	6.0	5.2	4.0	58
SD	2.20	2.30	.	1.30	2.74	

ComCom M	8.0	9.3	7.0	9.6	7.4	58
SD	2.15	.905	.	.894	1.82	

_____

Note. DK means that the students did not know their mother's education level. Computer and modem experience and computer comfort were declared on a scale from one to ten where one meant very low and ten meant very high. Computer and modem use frequency was declared on a scale from one to six where one meant hardly ever and six meant almost everyday.

Table C34

Symbolic Cultural Capital By Mother's Occupational Status

<div align="center">Mother's Occupational Status</div>

_____

Cultural Capital	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total	
_____	_____	_____	_____	_____	_____	_____	_____
Computer at Home							
Yes	5 (83%)	4 (80%)	12 (80%)	24 (77%)	1 (100)	46 (79%)	
No	1 (17%)	1 (20%)	3 (20%)	7 (23%)	0 (0%)	12 (21%)	
Modem at Home							
Yes	5 (83%)	4 (80%)	11 (73%)	20 (65%)	0 (0%)	40 (69%)	
No	1 (17%)	1 (20%)	4 (27%)	11 (35%)	1 (100%)	18 (21%)	
Total	6 (100%)	5 (100%)	15 (100%)	31 (100%)	1(100%)	58(100%)	

Table C35

Instrumental Cultural Capital By Mother's Occupational Status

Mother's Occupational Status

_____

Cultural Capital		High/Pro n = 6	Mid/Semi n = 5	Skilled n = 15	Unskill n = 31	Farm n = 1	n
Com Exp	M	6.8	7.6	6.7	5.8	1.0	58
	SD	2.79	2.70	2.26	2.24	.	
Mod Exp	M	5.0	6.4	4.6	4.4	1.0	58
	SD	3.52	2.88	3.27	2.69	.	
Com Fre	M	5.8	6.0	5.5	5.0	6.0	58
	SD	.408	.000	1.06	1.61	.	
Mo Freq	M	5.3	5.0	4.1	3.9	1.0	58
	SD	1.21	2.24	2.22	2.20	.	
Com Com	M	9.3	9.8	8.7	7.9	5.0	58

| | SD | 1.03 | .447 | 1.29 | 2.16 | . |

_____

Note. Computer and modem experience and computer comfort were declared on a scale from one to ten where one meant very low and ten meant very high. Computer and modem use frequency was declared on a scale from one to six where one meant hardly ever and six meant almost everyday.

Table C36

Symbolic Cultural Capital By Mother's Income Level

	Mother's Income Level					
Cultural Capital	<$20,000	$20-29	$30-39	>$40,000	DK	Total
Computer at Home						
Yes	21 (88%)	3 (60%)	2 (50%)	4 (100%)	15(75%)	45 (79%)
No	3 (22%)	2 (40%)	2 (50%)	0 (0%)	5 (25%)	12 (21%)
Modem at Home						
Yes	17 (71%)	3 (60%)	2 (50%)	4 (100%)	13 (65%)	39(68%)
No	7 (29%)	2 (40%)	2 (50%)	0 (0%)	7 (39%)	18(32%)
Total	24 (100%)	5 (100%)	4 (100%)	4 (100%)	20(100%)	57(100%)

_____

Note. DK means that the students did not know their mother's income level. One missing value is due to a student declining to answer the question about mother's income.

Table C37

Instrumental Cultural Capital By Mother's Income Level

		Mother's Income Level				
Cultural Capital		<$20,000 n = 24	$20-29 n = 5	$30-39 n = 4	>$40,000 n = 4	DK n = 20	n
Com Exp	M	5.9	6.6	6.5	8.5	5.6	57
	SD	2.24	2.07	3.51	1.91	2.52	
Mo Exp	M	4.2	4.6	5.5	8.3	4.4	57
	SD	2.44	1.95	4.20	2.06	3.33	
Com Fre	M	5.3	5.6	5.8	6.0	5.0	57
	SD	1.34	.894	.500	.000	1.65	
Mo Freq	M	4.0	4.2	3.5	6.0	4.2	57
	SD	2.12	2.05	2.89	.000	2.24	
Com Com	M	8.2	8.6	9.3	9.0	8.1	57
	SD	1.67	2.19	.957	2.00	2.26	

Table C38

Symbolic Cultural Capital By Father's Education Level

	Father's Education Level						
Cultural Capital	High Sch	Voc/Tech	Some Uni	Bach	>	DK	Total
Computer at Home							
Yes	27 (84%)	7 (64%)	3 (100%)	9 (90%)	0 (0%)		46 (79%)
No	5 (16%)	4 (36%)	0 (0%)	1 (10%)	2 (100%)		12 (21%)
Modem at Home							
Yes	22 (69%)	7 (64%)	3 (100%)	8 (80%)	0 (0%)		40 (69%)
No	10 (31%)	4 (36%)	0 (0%)	2 (20%)		2 (100%)	18 (31%)
Total	32 (100%)	11 (100%)	3 (100%)	10 (100%)		2(100%)	58(100%)

Note. DK means that the students did not know their father's education level.

Table C39

Instrumental Cultural Capital By Father's Education Level

Father's Education Level
_____

Cultural Capital	High Sch n = 32	Voc/Tech n = 11	Some Uni n = 3	Bach > n =10	DK n = 2	n
ComExp M	5.6	5.7	7.7	7.5	5.0	58
SD	2.80	2.45	1.52	2.55	2.83	
Mo Exp M	4.5	3.9	4.3	5.6	3.0	58
SD	2.45	2.91	3.22	3.41	1.41	
ComFre M	5.2	5.4	5.3	5.7	5.0	58
SD	1.50	1.50	.577	.483	5.31	
MoFreq M	4.0	3.8	4.0	5.1	1.5	58
SD	2.55	2.23	2.65	1.73	.707	
ComCom M	8.0	8.5	8.7	8.9	6.5	58
SD	3.02	1.29	1.53	1.29	2.12	

Note. DK means that the students did not know their father's education level. Computer and modem experience and computer comfort were declared on a scale from one to ten where one meant very

low and ten meant very high. Computer and modem use frequency was declared on a scale from one to six where one meant hardly ever and six meant almost everyday.

Table C40

Symbolic Cultural Capital By Father's Occupational Status

Father's Occupational Status

Cultural Capital	High/Pro	Mid/Semi	Skilled	Unskill	Farm	Total
Computer at Home						
Yes	8 (89%)	6 (86%)	17 (81%)	7 (54%)	8 (100%)	46 (79%)
No	1 (11%)	1 (14%)	4 (19%)	6 (46%)	0 (0%)	12 (21%)
Modem at Home						
Yes	7 (78%)	6 (86%)	15 (71%)	6 (46%)	6 (75%)	40 (69%)
No	2 (22%)	1 (14%)	6 (29%)	7 (54%)	2 (25%)	18 (21%)
Total	9 (100%)	7 (100%)	21 (100%)	13 (100%)	8(100%)	58(100%)

Table C41

Instrumental Cultural Capital By Father's Occupational Status

Father's Occupational Status
_____

Cultural Capital		High/Pro n = 9	Mid/Semi n = 7	Skilled n = 21	Unskill n = 13	Farm n = 8	n
Com Exp	M	7.2	5.6	6.5	5.8	5.6	58
	SD	2.44	3.31	2.18	2.28	2.69	
Mod Exp	M	5.3	5.4	4.4	4.5	3.9	58
	SD	3.35	3.65	2.91	2.76	2.64	
Com Fre	M	5.8	5.7	5.1	5.0	5.4	58
	SD	.441	.488	1.53	1.68	1.41	
Mo Freq	M	5.0	5.1	3.6	3.8	4.3	58
	SD	1.21	2.24	2.22	2.20	2.12	
Com Com	M	9.1	9.3	8.2	7.9	7.9	58
	SD	1.17	.951	1.69	2.58	2.23	

Note. Computer and modem experience and computer comfort were declared on a scale from one to ten where one meant very low and ten meant very high. Computer and modem use frequency was declared on a scale from one to six where one meant hardly ever and six meant almost everyday.

Table C42

Symbolic Cultural Capital By Father's Income Level

Father's Income Level

Cultural Capital	<$20,000	$20-29	$30-39	>$40,000	DK	Total
Computer at Home						
Yes	1 (100%)	1 (50%)	4 (50%) 15 (94%)	23(79%)	44(79%)	
No	0 (0%)	1 (50%)	4 (50%) 1 (6%)	6 (21%)	12(21%)	
Modem at Home						
Yes	0 (0%)	1 (50%)	4 (50%) 13 (81%)	20(69%)	38(68%)	
No	1 (100%)	1 (50%)	4 (50%) 3 (19%)	9 (31%)	18(32%)	
Total	1 (100%)	2 (100%)	8 (100%)	16 (100%)	29(100%)	56(100%)

Note. DK means that the students did not know their father's income level. The two missing values were due to two students declining to answer the survey question about father's income.

Table C43

<u>Instrumental Cultural Capital By Father's Income Level</u>

Father's Income Level

Cultural Capital	<$20,000 n = 1	$20-29 n = 2	$30-39 n = 8	>$40,000 n = 16	DK n = 29	<u>n</u>
Com Exp <u>M</u>	7.0	6.5	6.4	7.2	5.6	56
<u>SD</u>	.	.707	1.77	2.26	2.65	
Mo Exp <u>M</u>	6.0	2.0	4.0	5.8	4.4	56
<u>SD</u>	.	.000	1.69	3.29	3.04	
Com Fre <u>M</u>	6.0	5.5	4.9	5.8	5.1	56
<u>SD</u>	.	.707	1.81	.403	1.56	
Mo Freq <u>M</u>	5.0	1.5	2.6	4.8	4.5	56
<u>SD</u>	.	.707	2.33	2.02	2.01	
Com Com <u>M</u>	9.0	7.5	8.1	8.7	8.3	56
<u>SD</u>	.	.707	1.25	1.78	2.19	

<u>Note.</u> DK means that the students did not know their father's income level. Computer and modem experience and computer comfort were declared on a scale from one to ten where one meant very low and ten meant very high. Computer and modem use frequency was declared on a scale from one to six where one meant hardly ever and six meant almost everyday. The two missing values were due to two students declining to answer the survey question about father's income.