

**ATHABASCA UNIVERSITY**

**ATTENTION DEFICIT DISORDER IN ADULTS**

**AND DISTANCE EDUCATION**

**BY**

**DOROTHY (WILLY) FAHLMAN**

A thesis submitted to the  
Athabasca University Governing Council in partial fulfillment  
Of the requirements for the degree of

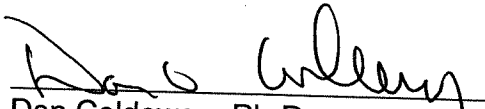
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Athabasca, Alberta

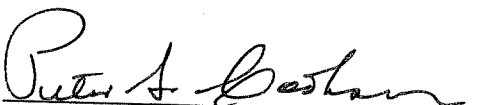
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# ATHABASCA UNIVERSITY

The undersigned certify that they have read and recommend to the Athabasca University Governing Council for acceptance a thesis "ATTENTION DEFICIT DISORDER IN ADULTS AND DISTANCE EDUCATION" submitted by DOROTHY (WILLY) FAHLMAN in partial fulfillment of the requirements for the degree of MASTER OF DISTANCE EDUCATION.

  
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## **DEDICATION**

This study is dedicated to my son Jamie who provided the impetus to undertake this research. I hope the findings will help him, and others like him in their journeys to achieve their greatest potentials.

## **ABSTRACT**

Attention Deficit Disorder (ADD) affects not only children but adults; one third to one half of children with ADD do not outgrow this disorder. The numbers of adults with ADD (ADDults) will increase as the children diagnosed with ADD become adults and as more adults are diagnosed with ADD. At the present time no documented research is available on ADDults as distance learners. Based on the literature on recommended learning strategies for ADDults, this preliminary study examined the relationship between ADDults' learning preferences, motivation and the instructional strategies of distance education. A questionnaire was developed to analyze the demographics, learning preferences and reasons for participating in distance education between an independent sample group of ADDults and a random independent control group of distance learners. Demographic data of the ADDult and control group suggested that the two groups were comparable. The learning preference results indicated that the ADDults preferred a learning environment that was structured, free of distractions and allows for mobility as recommended in the literature. Reasons for participating in distance education courses suggested ADDults preferred instructional strategies that allowed flexibility of time/pacing, control over the environment and instruction, and technology. This preliminary study demonstrated that the instructional strategies of distance education may be important in facilitating a learning environment that meets the needs of ADDults. It also established the need for further research of ADDults as learners and distance learners.

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# CHAPTER I

## INTRODUCTION

Attention Deficit Disorder (ADD), or as sometimes referred to as Attention Deficit Hyperactivity Disorder (ADHD), is a disorders frequently diagnosed in children. Studies suggest that the prevalence of ADD in children is from 3-9% of the total population (Shekim et al.,1990; Biederman et al.,1995). Shaywitz & Shaywitz (1992) propose that up to 20% of school-aged children are diagnosed with ADD.

Recent evidence suggests that ADD not only affects children but also adults. It is estimated that one-third to one-half of children with ADD do not outgrow this disorder and will continue to have symptoms as adults (Shekim et al.,1990). Hallowell & Ratey (1994) propose that that 8,000,000 to 15,000,000 American adults have ADD. Symptoms characteristic of ADD include restlessness, impulsivity, and distractibility/inattentiveness (Hallowell & Ratey, 1994). Adults with ADD (ADDults) generally have average to above average intelligence (Javorsky & Gussin,1994).

The literature suggests that ADDults have specific learning needs and requirements that can be assisted by compensatory strategies (Vogel, 1987). Instructional strategies that include “. . . flexibility in terms of classroom organization [e.g., large group versus small group instruction], . . . method of presentation [e.g., providing advanced organizers], method of practice [e.g., work sheets, texts, audio and visual materials], and testing procedures . . . will serve to assist students in compensating for specific weaknesses” (Skinner & Schenck ,1992, p. 373-374).

Researchers of ADDults suggest that these adults prefer a learning environment that is structured, free of distractions, allows for mobility and accommodations that will enhance their capabilities (McCormick & Leonard, 1994). Distance education may be able to provide the flexibility, structure and instructional strategies to meet the learning styles/preferences of ADDults. These distance education instructional strategies may include learner control of the instructional components versus instructor control, learner versus instructor pacing, and individualization versus large conventional group classrooms.

### Statement Of The Problem

All learners have their own unique styles/ preferences and motives for studying in different learning environments. The distance education learning environment allows for variations in time and place arrangements, accessibility, and individualization of instruction to accommodate learner's styles/preferences and motives (Reed & Sork, 1990).

At the present time, no documented research is available on ADDults as distance learners. It is not known if the motive for ADDults to become distance learners is their need to meet their learning preferences utilizing distance educational instructional strategies.

Furthermore, there are no studies that examine ADDults as distance learner in relation to:

1. The amount of time permitted for learning.
2. Preference of study location.

3. Individualization of instruction.
4. Variations in the amount of instruction.
5. The availability of technology in courses.
6. Distance education instructional methods.
7. Distance education instructional methods assisting in mastering the course objectives.
8. Preference of distance education instructional methods compared to conventional lecture methods.

Based on the possibility that there may be relationship between the preferences and motivation of ADDults as distance learners, the final research questions emerged:

1. Are the distance educational instructional strategies chosen by ADDults related to their learning preferences?
2. What motivates ADDults to become distance education learners?

These questions will examine the relationships between ADDults' learning preferences, motivation and the instructional strategies of distance education. The knowledge obtained from this study will provide deeper understanding of ADDults as distance learners.

### Literature Review

ADD is not a visible disability but rather a well hidden disorder that affects cognition (Hallowell & Ratey, 1994; Denckla, 1993, Erk, 1995). Individuals with ADD have difficulty attending to all the stimuli in their environment. Instead of “. . . being able to carve out discrete activities that would create a sensation of separate moments, the person cannot stop the flow of events. Everything runs together, unbraked, uninhibited ”

(Hallowell & Ratey, 1994, p. 283). Not only do people with ADD suffer from the inability to focus on one event but the converse may be true. They may also involuntarily hyperfocus or focus intensively on one activity for unspecified time periods. The activities that elicit a state of hyperfocus must be neurologically highly stimulating to the individual inhibiting all other extraneous stimuli (Conner,1994). These cognitive difficulties cause impairment in normal functioning resulting in the characteristic symptoms of ADD, for both children and adults: restlessness, impulsivity, and distractibility/inattentiveness (Hallowell & Ratey, 1994). Individuals with ADD may suffer from one of these symptoms or a combination of symptoms.

The severity of symptoms varies among adults with ADD (ADDults). Hyperactivity is prevalent in children with ADD, however this symptom does decrease with age (Ranseen & Campbell, 1996). ADDults may have comorbid psychiatric disorders similar to those seen in ADD children such as depression and anti-social behavior. Bierderman et al.,1993, and Spencer et al.,1994, argue that these comorbid psychiatric disorders are secondary to ADDult. Hallowell & Ratey, 1995, indicate that ADDults have many positive qualities such as “. . . creativity (because creativity depends on some degree of disinhibition), spontaneity, high energy, and openness” (p. 3).

There have been much research that gives evidence that ADD is a neurobiological disorder involving brain dysfunction ( Anastopoulos & Barkley, 1991; Barkley et al.,1992; Denckla, 1991; Giedd et al.,1994; Zemetkin et al.,1990). The neurological basis for ADD examines the dysfunction of brain areas, especially the frontal lobe in combination with deficiencies or imbalances of neurochemicals in the

brain (Ricco et al., 1993). It is suggested that ADD has a genetic risk factor and that it is familial (Biederman et al., 1986, 1990, 1992, 1995). "Although intelligence per se is not affected by attention disorders, the client's intellectual development may be uneven . . . ADD can cause a child not to reach his or her full potential " (Erk, 1995, p. 135).

The diagnosis of ADD in adults is based on systematic assessment methods including medical and family history, physical examination, and psychological testing ("Attention Deficit Disorder: Not Just a Children's Problem Anymore," 1993). Adults who are diagnosed with ADD do not develop the symptoms as adults but rather have had undiagnosed or misdiagnosed ADD symptoms throughout their childhood. Many adults are diagnosed with ADD only after their children have been diagnosed with ADD (Bierderman et al., 1993).

The standard diagnostic criteria for diagnosing ADD is the DSM-IV (APA, 1994). As Hallowell & Ratey, 1995, state:

DSM-IV defines ADD [as]:

A. Either (1) or (2):

(1) six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

*Inattention*

(a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities

(b) often has difficulty sustaining attention in tasks or play activities

- (c) often does not seem to listen when spoken to directly
  - (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
  - (e) often has difficulty organizing tasks and activities
  - (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
  - (g) often loses things necessary for tasks or activities
  - (h) is often easily forgetful in daily activities
- (2) six (or more ) of the following symptoms of hyperactivity-impulsivity have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

*Hyperactivity*

- (a) often fidgets with hands or feet or squirms in seat
- (b) often leaves seat in classroom or in other situations in which remaining seated is expected
- (c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings or restlessness)
- (d) often has difficulty playing or engaging in leisure activities quietly

(e) is often “on the go” or often acts as if “driven by a motor”

(f) often talks excessively

*Impulsivity*

(g) often blurts out answers before questions have been completed

(h) often has trouble awaiting turn

(l) often interrupts or intrudes on others (e.g. butts into

conversations or games)

B. Some hyperactive-impulsive symptoms that caused impairment were present before the age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning. (pp. 3-4).

The DSM-IV criteria is often used in combination with other types of ADDult measurement tools such as the Wender Utah Rating Scale (Ward, Wender, & Reimherr, 1993).

Treatment of ADDults is similar to those methods used for children (Erk, 1995). Depending on the severity of the disorder, treatment may include any combination of counseling, education/employment accommodations and/or medications ( “Attention Deficit Disorder: Not Just a Children’s Problem Anymore,” 1993).



Learning styles and learning preferences. Each learner is unique in his needs, interests, skill levels and his interaction with his environment (Sewall, 1986). “The way in which a learner receives and interacts with instruction and responds to the learning environment is known as the student’s learning style” (Billings, 1991, p. 2). Learning style and learning preference instruments examine methods to meet these individualized needs .

Many different models have been designed to measure the learning style elements; sociological, physical, psychological and environmental. The instruments, developed for these models, differ as to which variables or combination of variables they measure (Billings, 1991). Some models are personality inventories such as the *Myer’s-Briggs Type Indicator* (Myers, 1962). Others like Kolb’s *Learning Style Inventory* (Kolb,1985) and the *Gregorc Type Indicator* (Gregorc, 1984) measure information processing. Many instruments measure cognitive styles and are based on the Witkim & Goodenough’s (1981) tool on field dependance and field independence (Sewall, 1986).

Learning preference models such as the *Canfield Learning Styles Inventory* (Canfield & Canfield, 1978), *Renzulli/Smith Learning Style Inventory* (Renzulli & Smith, 1978) and the Dunn, Dunn, and Price (1982) *Productivity Environmental Preference Survey* assess the instructional preferences of adult learners. The preferred learning environment of each adult learner is individualized and unique, varying significantly between learners (e.g. some learners may prefer to study independently while others like to learn in groups). Recognizing these differences in

preferred learning environments of adult learners and making appropriate accommodations for their preferences can encourage increased academic achievement (Dunn et al., 1995). Learning preferences are the instructional environments, methods and resources that are effective for learning for each individual. “. . . The stronger the preference, the more important it is to provide compatible instructional strategies “ (Dunn et al., 1995).

“Many students who are ‘learning different’ will be able to demonstrate their intellectual abilities and untapped potential when allowed to learn through their strengths, combined with modifications of the learning environment and instruction to accommodate their learning styles” (Yong & McIntyre, 1992, p. 125).

Adult students with ADD fall into this typology of “learning different”. They generally have average to above average intelligence (Javorsky & Gussin, 1994) but have very specific needs in relation to their learning environment. ADDults require a preferred learning environment that is structured, free of distractions, allows for mobility and accommodations that will enhance their capabilities (McCormick & Leonard, 1994).

ADDults as learners. ADDults, who have specific learning differences, require compensatory strategies in their learning environments (Vogel, 1987). Javorsky & Gussin (1994) indicate that the accommodations or instructional strategies that are advocated for learning disabled college students are also appropriate for ADD students. Instructional strategies such as “. . . flexibility in terms of classroom

organization [e.g., large group versus small group instruction], . . . method of presentation [e.g., providing advanced organizers], method of practice [e.g., work sheets, texts, audio and visual materials], and testing procedures . . . will serve to assist students in compensating for specific weaknesses” (Skinner & Schenck ,1992, p. 373-374). Successful learning outcomes as a result of instructional strategies may be a result enjoyed by all adult learners and not restricted to only learning disabled students and ADDults. Auxiliary aids such as earplugs, tape recorders, computers, textbooks on tape and white noise machines may also be used to facilitate learning with ADDults (McCormick & Leonard, 1994).

Javorsky & Gussin (1994) propose the following instructional strategies for ADDult learners:

1. Making the syllabus available four to six weeks before the beginning of class and, when possible, being available to discuss the syllabus with students considering the course.
2. Beginning the lectures with review of the previous lecture and overview of topics to be covered that day.
3. Using the chalkboard to outline lecture material.
4. Emphasizing important points, main ideas, and key concepts orally and/or highlighting them with colored pens on overhead. . . .
7. Trying to eliminate or at least reduce auditory and visual classroom distractions such as outside noise.
8. Leaving time for a question-answer period and/or

discussion periodically and at the end of each lecture and providing periodic summaries and highlights during the lecture.

9. Giving assignments in writing as well as orally and being available for clarification or discussion.
10. Being available during office hours for clarification of lecture material, assignment, and readings.
11. Selecting a textbook with study guide, if available, offering question and answer sessions, and review sessions.
12. Providing study questions for exams that show both the test format and content.
13. Encouraging the student to enroll in difficult classes in the morning rather than in afternoon or evening.
14. Encouraging the student to enroll in classes that are small (under 30 students) and scheduled for short durations of time (under one hour and fifteen minutes).
15. Allowing the student to enroll in a reduced course load and extending the time for completion of degree requirements (p. 175).

Flexibility of when, where and how ADDults study promotes their opportunity for success as learners.

Distance education, learning styles/ preferences and ADDults. “Like traditional education, distance education is a complex interaction of learner, setting, instruction

and outcome” (Billings, 1991 p. 2). Unlike traditional education, distance education may be able to offer flexibility for these elements to successfully interact.

As Reed and Sork (1990) suggest, there are five commonalities that are characteristic to distance education:

1. Learners - most distance education learners are adults (Nelson, 1988).
2. Time and place arrangements - the time and place arrangements between the learner and instruction may be either synchronous or asynchronous.

Crawford (1996) discusses the different distance education arrangements including:

- a. same place at different times
- b. different places at the same time
- c. different places at different time
- d. same place at the same time.

These different arrangements release “the learner from the constraints of time and place that exist in traditional education” (Reed & Sork, 1990, p. 32)

3. Institutional base - distance education may be a subsection of a traditional education institution or an autonomous distance education institution such as open learning universities (Keegan, 1990).

4. Increased access - distance education increases the opportunities for learners to physically and psychologically access education and resources (Gibson, 1991).

5. Individualization - “. . . perhaps even more than traditional education settings, it is possible for educational institutions supporting learning at a distance to provide for

individual purposes and processes in meeting learning needs” (Reed & Sork, 1990, p. 33).

Gibson (1991) describes distance learners as dynamic adult learners whose affective dimensions play an important role in their success. These affective variables include “. . . motivation, level of commitment, feelings of power, control, confidence, and competence . . . self-esteem (Garrison, 1990), intent to complete (Billings, 1988), conative capacity and attention control (Atman, 1991), and agenda setting (Holt et al., 1990)” (Gibson, 1991, p. 35). These dynamic adult learners have their individual learning styles and preferences. Billings (1991) reports that learning preferences of the adult learner in distance education affects their learning outcomes (Gibson, 1991). Distance education may afford the adult learner greater opportunity to match their learning styles and preferences with the learning environment.

The learning environment in distance education is as dynamic as the adult learners it embraces. It fosters learner control and self-directness, promoting empowerment. The adult distance learner is able to select the contents and processes for meeting their individual needs.

Distance education technology allows for a systematic design of instruction (Ely & Plomb, 1986) that bridges the temporal and spatial gaps between the learner and instructor (Reed and Sork, 1990). This distance education technology can provide the adult learner with either synchronous or asynchronous learning opportunities. The distance learner is able to meet their learning preferences for time and place. Adult distance learners can control the extraneous environmental variables of time and place that impact their learning outcomes.

The institutional bases that deliver distance education to adult learners vary. These bases may originate in a post-secondary educational system, conventional university, open university, or by a consortium of education-related institutions (Verduin & Clark, 1991). The variety of bases available provides flexible boundaries for the adult learner to select the environment that is most conducive to their learning preferences. Gay (1996) indicates that “. . . adults with learning disabilities [and ADDults] can employ one or a combination of these systems in the distance learning processes” (p. 379).

Access to education and resources in distance education is not only physical access (information or content delivery) but also includes psychological access (Gibson, 1991). Psychological access places “. . . the emphasis on the learner selectively and critically evaluating the new information in light of his/her knowledge, understanding, experience and creating new knowledge and understanding for his/her own purposes” (Gibson, 1991, p. 39).

The instructional strategies in distance education may provide for physical and psychological access for ADDults. ADDults may be able to select the preferred instructional strategy based on their needs. These instructional strategies may include media that employs distance education technology for telecommunication. The use of technology in distance education may provide the opportunity for increased interaction between the learner and instructor. “The advantages of assistive technology for adults with learning disabilities [and ADDults] are autonomy, flexibility, and independence in a variety of environments” (Gay, 1996, p. 371). However, the quality of the instruction is dependent upon the expertise of the instructor and not the technology (Shaw & Taylor, 1984).

“Instruction is individualized to the extent that it adjusts to differences in learners . . . [adjusting in] pace, content, sequence, and/or style of instruction to the needs of the individual learners” (Fletcher, 1992, p. 1). Individualizing pace allows the learner to proceed through the instructional content at their own learning rate, at their own speed. Individualizing content allows the learner to control the degree of difficulty of the course content. Individualizing sequencing allows the learner to control sequencing of instructional content in relation to when topics or items are presented. Individualizing style refers to the instructional style adjusting to the learner style (Fletcher, 1992).

In distance education, the learner may have options as to who controls the pacing of the instructional content, the degree of difficulty of the content, the sequencing of the content and the matching of instructional style to learner style and preference. These options include total learner control over the attributes, total instructor control over the attributes or a combination of learner and instructor control where there are varying degrees of who controls the attributes. For ADDults, individualization of instruction may be adapted to meet their needs and promote their learning outcomes.

Distance education as a system of instruction may be capable of providing flexibility for successful interaction between learners, setting, instruction and outcomes for those with learning differences. Successful interaction is directly related to the quality of instruction delivered. Distance education that does not include instructional strategies that promote successful learning outcomes is not beneficial for any learner including those with learning differences. In distance education, the learning strategies for ADDults recommended by Javorsky & Gussin (1994) may be found.



Javorsky & Gussin (1994) proposed strategies:

1. Making the syllabus available four to six weeks before the beginning of class and, when possible, being available to discuss the syllabus with students considering the course.

2. Beginning the lectures with review of the previous lecture and overview of topics to be covered that day.

3. Using the chalkboard to outline lecture

4. Emphasizing important points, main ideas, and key concepts orally and/or highlighting them with colored pens on overhead.

5. Trying to eliminate or at least reduce auditory and visual classroom distractions such as outside noise.

6. Leaving time for a question-answer period and/or discussion periodically and

Distance Education

instructional strategies:

1. Course materials are normally available prior to course commencement.

2. Advanced organizers are commonly used in study guides.

3. Important points are material.

emphasized in the

objectives and key concepts are highlighted.

4. Course materials are generally outlined in the study guides.

5. Classroom auditory and visual distractions are reduced or eliminated

6. Opportunities for question-answered

at the end of each lecture and providing periodic summaries and highlights during the lecture.

7. Giving assignments in writing as well as orally and being available for clarification or discussion.

8. Being available during office hours for clarification of lecture material, assignment, and readings

9. Selecting a textbook with study guide, if available, offering question and answer sessions, and review sessions.

10. Providing study questions for exams that show both the test format and content.

11. Encouraging the student to enroll in difficult classes in the morning rather

periods and interaction can be offered via distance education technology.

7. Assignments can be given in writing and discussed orally via distance education technology.

8. Availability of instructors may be increased through distance education technology.

9. Textbooks commonly accompany study guides.

10. Review questions are typically provided in the study guides.

11. Flexibility in courses to study according to

than in afternoon or evening.

12. Encouraging the student to enroll in classes that are small (under 30 students) and scheduled for short durations of time (under one hour and fifteen minutes).

13. Allowing the student to enroll in a reduced course load and extending the time for completion of degree requirements (p.175).

their spatial and temporal preferences.

12. Learners are able to select individual learning versus group learning and control the duration of study time.

13. Learners can control pace of study and course load.

## CHAPTER II

### METHODOLOGY

#### Research Design

Survey methods produce quantifiable information “. . . about the social world and describe features of people [and] their beliefs, opinions, characteristics, and past or present behavior” (Neuman, 1991, p. 228). This method can generate data that increases understanding of the relationships between ADDults’ learning preferences, motivation and the instructional strategies of distance education.

Surveys utilize a deductive research approach that begins with the research problems to be studied (Neuman, 1991). In this study, the research problem centered around the possible relationships between the styles/preferences and motivation of the ADDult as a distance learner. In defining the research problem clearly and completely, research questions were developed employing a hierarchical approach generating broad questions initially and ending with specific questions (Jaeger, 1988). Research questions are the basis for design, planning and data collection of the survey. A general, preliminary list of possible areas of inquiry was generated:

1. Do ADDults participate in distance education courses?
2. How does the learning environment of ADDults play a role in meeting their learning needs?
3. Are the instructional strategies of distance education programs appropriate for ADDults?

4. Do ADDults choose distance education courses versus conventional education courses?

5. Why do ADDults choose distance education courses versus conventional education courses?

As the questions became more structured and specific in relation to the possibility that there may be relationship between the styles/preferences and motivation of ADDults as distance learners, the final research questions emerged:

a. Are the distance educational instructional strategies chosen by ADDults related to their learning preferences?

b. What motivates ADDults to become distance education learners?

As Jaeger (1988) suggests, “. . . the research questions practically define the content of the questionnaire or interview protocol” (p. 310).

Type of survey. Surveys are used to gather data on people or things.

Generating data on people can be achieved using the techniques of questioning and/or observation (Simon & Burnstein, 1985). For this survey, data was generated using a three part questionnaire.

The most common classifications of questionnaire surveys are those done by telephone, personal interviewing or mail (Simon & Burnstein, 1985). Each of these classifications have advantages and disadvantages as discussed by Neuman (1991):

1. Telephone surveys - moderate in cost, fast to conduct, response rate is moderate, number of questions asked must be short and with some interviewer bias.

2. Personal interviewing - expensive in cost, slow to moderate speed to conduct, high response rate, no restrictions on the number of questions asked and high possibility for interviewer bias.

3. Traditional mail questionnaire - economical in cost, slow speed to conduct, moderate number of questions can be asked, moderate response rate and no interviewer bias.

Similar to traditional mail questionnaires is utilizing electronic fax to conduct a survey. This technique has the advantages of traditional mail questionnaires as it is economical in cost, moderate numbers of questions can be asked, and no interviewer bias is shown, but unlike traditional mail surveys, it increases transmission and response times.

Another classification of questionnaire survey that has not been discussed widely is electronic mail for research. "Email survey research is the systematic data collection of information on a specific topic using computer questionnaires delivered to an online sample or population" (Thach, 1995, p. 27). As Thach (1995) discusses, this survey technique is economical in cost, fast to conduct, has a high response rate with more candid responses but does limit the sample to those who have computers and are on-line, and does not guarantee confidentiality due to on-line networks.

The advantages and disadvantages of the classifications were carefully considered. The resulting choice of techniques for this study was a combination of e-mail, electronic fax and traditional mail survey research.

Not all distance learners have access to e-mail and on-line networks, therefore for those who lacked access to e-mail, electronic fax was employed. Lastly, for those

distance learners who had no access to either e-mail or electronic fax, the traditional mail service was utilized.

Survey instrument. The purpose of the survey instrument is to collect data which is guided by the research questions and also the characteristics of the respondents ( Plumb & Spyridakis, 1992). To achieve the survey instrument's purpose for this study, a questionnaire was developed with three sections: demographics, learning preferences and reasons for participating in distance education courses (see Appendix B). The questionnaire incorporated the following format and layout:

1. Information related to confidentiality in the introduction.
2. Specific instructions that facilitated responses in either type or handwriting.
3. Appropriate spacing for either typed or handwritten responses.
4. Example statements and responses related to questions on learning preferences and reasons for participating in distance education courses.
5. Length of questionnaire was limited to five pages to facilitate response.
6. Respondents were thanked for their participation in the survey.

The first section of the questionnaire, demographics, gathered data on the distance learner's social background (name, age, gender, marital status, employment status and residency) and distance educational background (student status, distance education courses taken including year, levels and instructional methods, future educational plans). The questions were open and elicited unstructured responses.

This information was required to identify characteristics of the distance learners.

The second section of the questionnaire on learning preferences was developed in a matrix questionnaire format. A matrix questionnaire is a “. . . compact way to present a series of questions using the same response categories” (Neuman, 1991, p. 248). This section consisted of a 23 questions with three questions having sub-sections for a total of 32 questions. These questions were developed from the literature on learning styles and preferences as none of the models studied were specifically structured to measure either distance education or ADD.

Closed questions were used in this section to elicit structured responses and to :

(a) Allow respondents to answer the same question so that

the answers can be meaningfully compared. (b)

Produce less variable answers. (c)

Present a recognition, as opposed to a recall, task to

respondents and for this reason respondents find them  
much easier to answer. (d)

Produce answers that are much easier to computerize

and analyze (Foddy, 1993, p. 128).

The response section of learning preferences was structured and incorporated a Likert scale. With structured questions “. . . respondents can more reliably and quickly answer the questions, and researchers can more reliably and quickly interpret and analyze the answers” (Plumb & Spyridakis, 1992, p. 632). The Likert scale for responses consisted of a five point scale including the categories of strongly disagree, disagree, undecided, agree and strongly agree. The questions in the learning preference section of the questionnaire were classified into two categories; distance



education and neutral (not directly related to distance education). Each question was classified by two reviewers. Perfect reliability (100%) was achieved in classification of all questions into both categories.

Section three of the survey, reasons for participating in distance education course, was similar to the section on learning preferences incorporating 14 closed questions (one question having a sub-section) and eliciting structured responses on the same Likert scale. These questions were written to reflect Javorsky & Gussin (1994) recommended learning strategies for ADDults. The last question in this section (listing the primary reasons for enrolling in distance education courses/programs) was an open question requiring an unstructured response. Formulating a closed question with corresponding structured responses for all the probable primary reasons for enrolling in distance education courses/programs would have been an arduous task.

Sampling. Sampling is the systematic process of selecting cases for research study (Neuman, 1991). In this research study, two sample groups were formed: an ADDult group and a control group.

The sample group of ADDults used in this survey was similar to the ADDults represented in the literature. The target population comprised of ADDults who were male or female distance learners, 18 years of age or older, residing in rural or urban areas in Canada or the United States. They had participated in distance education courses since 1991 or are now participating in distance education courses. The distance education course levels range from high school to doctorate level and allow for the different distance education arrangements including:

- a. same place at different times.
- b. different places at the same time.
- c. different places at different time.
- d. same place at the same time.

The ADDult sample group was based on purposive sampling. As Neuman, 1988 discusses purposive sampling:

. . . is appropriate in three situations. First, a researcher uses it to select unique cases that are especially informative . . . Second, a researcher may use purposive sampling to select members of a difficult-to-reach, specialized population . . . [and] when a researcher want to identify particular types of cases for in-depth investigation. The purpose is less to generalize to a larger population than it is to gain deeper understanding of the types (pp. 203-204).

ADDults are a unique and specialized population who are difficult to reach. Their cognitive difficulties that cause impairment in normal functioning resulting in restlessness, impulsivity, and distractibility /inattentiveness (Hallowell & Rately, 1994) creates difficulties for sampling. The very symptoms that are characteristic of ADDults makes it vexatious to contact them, to acquire their commitment for this study, and to obtain their responses. Based on the projected difficulties of obtaining respondents for this survey, the minimum number for this sample was set at 10.

The second sample group formed for comparison with the ADDult group, was a randomized independent control group of a minimum of 10 distance learners who did

not have ADD. With random sampling “. . . every element in the population has the same chance of being sampled. Second, selection of any one element has no influence on the chance that any other element is selected “ (Jaegar, 1988, p. 317).

Pilot survey. A pilot survey was conducted to analyze the appropriateness of the questionnaire and to determine what revisions would be required for successful implementation. The questionnaire to be used with the ADDult group and the control group was piloted on four distance learners who had varied educational levels from high school to Master. These distance learners were asked to critique the questionnaire as to the clarity of the instructions, questions and responses; ambiguity between the instructions and responses; length of time to complete the questionnaire; and any recommendations for improvement.

The pilot group were able to successfully complete the questionnaire within 20 minutes from initiation. Recommendations from the pilot group included:

1. Simplification in wording of six questions
2. Formatting and editing changes
3. Providing examples to illustrate the instructions.

In addition to the questionnaire being critiqued by the pilot group, it was analyzed on four separate occasions by the advisor for this study. The recommendations from the pilot group and advisor were incorporated in a revised questionnaire.

### Data Collection

To obtain a minimum sampling of 10 ADDults of the target population for this study, an advertisement was developed (see Appendix A) to publicize the need for volunteers. This advertisement was distributed to Athabasca University; Learning Disabilities Association of Canada; The Learning Centre (Calgary); CH. A.D.D. Canada Inc. (Children and Adults with Attention Deficit Disorder); ADHD, Taking Control through Knowledge, Brandi Valentine (website); and CPA chat board (Canadian Psychological Association - website).

Response to the advertisement from the target population for a sample of ADDults occurred over a six month period from June, 1997 - January, 1998. Of the 11 ADDult volunteers who responded to the advertisement, 10 respondents expressed interest in participating in the study by e-mail and one responded indicating that she would respond using the postal service.

A randomized independent control group of distance learners, who did not have ADD, was obtained with the assistance of the Registrar's Office at Athabasca University in January, 1998. The Registrar's office supplied a randomized list of names, phone numbers and addresses of 20 distance learners at Athabasca University who could be contacted as possible volunteers for the research control group. From the potential list of 20 distance learners, 13 distance learners were successfully contacted by phone. After being provided with similar information as on the advertisement for ADDult volunteers (see Appendix A), 12 responded favorably to participating in the study. Of the 12 respondents, six stated that they would respond to the questionnaire by electronic fax, three stated that they would respond using the traditional postal service while three stated that they would use e-mail.

Both sample groups were sent the same questionnaire according to their preferred route of transmission (e-mail, electronic fax or traditional mail) in January, 1998. Distance learners that were responding to the questionnaire by traditional postal service also received a stamped, self-addressed return mailer envelope.

Prior to transmitting the questionnaire, those distance learners who were responding by e-mail were sent a message specifying the computer program that would be used (see Appendix C). Only two learners responded that they were not able to receive the questionnaire using this program, therefore the questionnaire was sent to them as part of an e-mail message using cut-and-paste techniques.

Over a six week period starting January 23, 1998 and ending March 6, 1998, the ADDult sample returned 10 questionnaires. Eight questionnaires were returned by e-mail, one by postal mail and one by electronic fax as one respondent was not able to return the questionnaire by e-mail. Reminder e-mails were sent out on a biweekly basis over this six week period to encourage the ADDult sample to respond (see Appendix D). The one respondent from the ADDult sample group who returned her questionnaire by postal mail did not require a reminder. There was one non-response from the ADDult sample group.

The randomized control group returned their questionnaires by e-mail, electronic fax or postal mail. Reminder messages were sent biweekly by electronic fax or e-mail to the respondents in this sample. Non-response occurred from two of the respondents (one by electronic fax and one by e-mail). Total of 10 questionnaires were returned from the control group (five by electronic fax, three by traditional mail service and two by e-mail).

Costs. Costs incurred during data collection were related to phone charges (for contacting the control group), electronic fax charges, postal fees and internet charges. These costs were all minimal. No monetary incentives were employed with the sample groups.

### Ethical Considerations

All respondents in this survey participated on a voluntary basis. They were informed in the introduction to the survey questionnaire that confidentiality and the anonymity of the respondents would be maintained by the researcher (see Appendix B).

The advertisement for ADDult distance learners for this study (see Appendix A) received approval from the Human Subjects Sub-Committee at Athabasca University prior to distribution.

## CHAPTER III

### RESULTS

#### Demographics

The demographic results from the questionnaire identified subject characteristics of the ADDult group and the control group (see Table 1). Based on the analysis of the demographic data, the independent sample of ADDults and the independent random based sample of the control group were comparable on key demographic indicators although not matched on all demographic characteristics.

The ADDult group results showed there were five females and five males within the group with varying age ranges from 18 - 50+ years. In Table 1, the age ranges are divided into four categories with the numbers of females and males listed in each age range. There are ADDults listed in each category of ages; the five men are listed in the highest age ranges.

In comparison to the ADDult group, the control group consisted of eight females and two males. Table 2 categorizes the control group members into the same age ranges as the ADDult sample members. There are no control group members in the age range of 40 - 49 years. The two males are in the lowest age range.

Of the 10 ADDults, the results of the demographics indicate that seven respondents lived in urban areas while the other three resided in rural areas (see Table 1). The same results were noted for the control group; seven members lived in urban areas while three were rural residents (see Table 2).

Table 1

Demographics of ADDult Group

	18 - 29 yrs	30 - 39 yrs	40 - 49 yrs		50 & + yrs
Gender: Female (F)= 5 Male (M)= 5	F 2	F 2	F 1	M 3	M 2
Address: Rural(R), Urban (U)	1R 1U	1R 1U	1U	1R 2 U	2U
Marital status Single (S), Married (M), Divorced (D)	2M	2D	1S	2M 1D	2M
Employment : Full time (F) Part time (P) Unemployed (U)	1F 1U	1P 1U	1U	2F 1U	1F 1P
Student status: Full time (F), Part time (P)	2F	1F 1P	1P	1F 2P	2P
Distance Education Course levels taken: High School				4	
College		1			
University - 100 level	4		2		1
University - 200 level	1	1	9	5	2
University - 300 level		1	10	2	
University - 400 level		2	3		
University - 500 level					
University - 600 level					6
Instructional Methods used by students:					
correspondence		2	1	1	1
computer conferencing	2	1		2	2
television	1				



Table 2

Demographics of Control Group

	18 - 29 yrs		30 - 39 yrs	40 - 49 yrs	50 & + yrs
Gender: Female (F)= 8 Male (M)= 2	F 4	M 2	F 3		F 1
Address: Rural(R), Urban (U)	3R 1U	2U	3U		1U
Marital status: Single (S), Married (M) Divorced (D)	2S 2M	2S	3M		1D
Employment: Full time (F), Part time (P) Unemployed (U)	2F 1P 1U	1F 1U	2F 1P		1F
Student status: Full time (F), Part time (P)	1F 3P	1F 1P	1F 2P		1P
Distance Education Course levels taken: High School					
College					
University - 100 level	4	1	2		
University - 200 level	3		8		8
University - 300 level	2	1	2		15
University - 400 level			4		2
University - 500 level					
Instructional Methods used by students:					
correspondence	4	1	3		1
computer conferencing	1	1			
television					

Marital status was divided into the following categories: single, married, or divorced (see Tables 1 and 2). The number of ADDults in each category as compared to the control group was relatively the same.

The employment status of the ADDult and control samples was divided into unemployed, part time and full time (see Tables 1 and 2). In both the ADDult sample group and the control group, there were more students employed full time than part-time with the ADDult sample having as many working full time as unemployed.

For both groups, the student status was categorized into full time or part time (see Tables 1 and 2). The results indicate that for ADDults as well as the control group more students were classified as part-time than full time.

The total number of distance education courses reported as taken by the ADDults was 54 (see Table 1). The courses taken by the ADDults were high school, college, university levels 100, 200, 300, 400 and 600. Table 1 lists the number of ADDults taking each level of course. In comparison, the total number of distance education courses reported as taken by the control group was 52 (see Table 2). No distance courses were taken by the control group at the high school or college level. The courses recorded for the control group were at the university 100, 200, 300 and 400 levels. Table 2 lists the number of control group members taking each level of course.

The instructional methods used by the students for distance learning were correspondence, computer conferencing and television (see Tables 1 and 2). The ADDults had five of the sample participating in correspondence courses while seven had utilized computer conferencing for distance learner. One of the ADDults had

taken distance education courses using television. In contrast, the control group had nine participants who had participated in correspondence courses with two participants studying by computer conferencing. No members of the control group had taken distance education courses by television.

Summarization of all the age segmented demographic data is depicted in percentages in Table 3. Summation of the total percentages of demographic data of ADDults and the control group is seen in Table 4.

Future plans for the ADDult and control groups were similar (see Table 5). All respondents indicated that they would like to continue their educational growth except for one respondent in the ADDult group who answered this question with a question mark only, indicating indecision.

Table 3

Age Segmented Demographic Data Percentages for ADDult and Control Groups

<b>Demographics</b>	<b>18-29 years</b>		<b>30-39 years</b>		<b>40-49 years</b>		<b>50 &amp; + years</b>	
	<b>ADDult</b>	<b>Control</b>	<b>ADDult</b>	<b>Control</b>	<b>ADDult</b>	<b>Control</b>	<b>ADDult</b>	<b>Control</b>
Gender: Female	<b>20%</b>	40%	<b>20%</b>	30%	<b>10%</b>		-	10%
Male		20%			<b>30%</b>		<b>20%</b>	
Address: Rural	<b>10%</b>	30%	<b>10%</b>		<b>10%</b>			
Urban	<b>10%</b>	30%	<b>10%</b>	30%	<b>30%</b>		<b>20%</b>	10%
Marital Status:	-							
Single		40%			<b>10%</b>			
Married	<b>20%</b>	20%		30%	<b>20%</b>		<b>20%</b>	
Divorced			<b>20%</b>		<b>10%</b>			10%
Employment:								
Full time	<b>10%</b>	30%		20%	<b>20%</b>		<b>10%</b>	10%
Part time		10%	<b>10%</b>	10%			<b>10%</b>	
Unemployed	<b>10%</b>	20%	<b>10%</b>		<b>20%</b>			
Student Status								
Full time	<b>20%</b>	20%	<b>10%</b>	10%	<b>10%</b>			
Part time		40%	<b>10%</b>	20%	<b>30%</b>		<b>20%</b>	10%
Courses taken:								
High School					<b>7%</b>			
College			<b>2%</b>					
University -100	<b>7%</b>	10%		4%	<b>4%</b>		<b>2%</b>	
-200	<b>2%</b>	6%	<b>2%</b>	15%	<b>26%</b>		<b>4%</b>	15%
-300		6%	<b>2%</b>	4%	<b>22%</b>			29%
-400			<b>4%</b>	7%	<b>5%</b>			4%
-500								
-600							<b>11%</b>	
Methods taken:								
Correspondence		46%	<b>15%</b>	27%	<b>15%</b>		<b>8%</b>	9%
Computer Conference	<b>15%</b>	18%	<b>8%</b>		<b>15%</b>		<b>15%</b>	
Television	<b>8%</b>							

Table 4

Total Demographic Data Percentages  
for ADDult and Control Groups

<u>Demographics</u>	<u>ADDults</u>	<u>Control</u>
Gender: Female	50%	80%
Male	50%	20%
Address: Rural	30%	30%
Urban	70%	70%
Marital Status:		
Single	10%	40%
Married	70%	50%
Divorced	20%	10%
Employment:		
Full time	40%	60%
Part time	20%	20%
Unemployed	40%	20%
Student Status		
Full time	40%	30%
Part time	60%	70%
Courses taken:		
High School	7%	
College	2%	
University -100	13%	14%
-200	34%	36%
-300	24%	39%
-400	9%	11%
-500		
-600	11%	
Methods taken:		
Correspondence	38%	82%
Computer Conference	53%	18%
Television	8%	

Table 5

Future Educational Plans for ADDult and Control Groups

<b>ADDult Group</b>	<b>Control Group</b>
<b><u>Technical/Vocational Plans</u></b>	<b><u>Technical/Vocational Plans</u></b>
1. Learning as much as possible about computers	1. Computer building and trouble shooting.
2 Design Engineering at NAIT in fall of '98 after completion of adult-upgrading and possibility of a university engineering degree after that	2. To take a couple of more classes to transfer in order to receive my Business Admin. diploma
	3. Finish my diploma at Grant MacEwan College
<b><u>Degree Plans</u></b>	<b><u>Degree Plans</u></b>
1. Complete B.A. and Masters in Anthropology.	1. Complete Bachelor of Business Administration
2. Finish BA Psyc thru (sic) Athabasca U, apply to Dept. of Educational Psychology at U of Calgary to do Master's, eventually Ph.D., in Counseling Psychology	2. To complete my Bachelor of Administration Degree with Management Concentration
3. Complete Associates 12/98; Continue for Bachelor's 1/99.	3. Finish B.Sc. Geology at the University of Calgary.
4. Working on a law degree	4. Potential Master's Degree
5. To complete my bachelors degree at the very least	5. BScN
	6. Complete my degree
<b><u>Other Educational Plans</u></b>	<b><u>Other Educational Plans</u></b>
1. To establish a Lifelong Learning Institute.	
2. None as yet would just like to finish first.	

3. ? (sic)	
------------	--

## Learning Preferences

Descriptive analysis. The results obtained for this section of the survey from the ADDult sample and the control group were obtained from 23 questions with 9 subsection questions for a total of 32 questions administered (see Tables 6 and 7). The responses to the statements were ranked as follows:

SD - strongly disagree, D - disagree, U - undecided, A - agree,

SA- strongly agree.

In examining the responses to the survey questions on learning preferences of the ADDult and control groups almost 35% of the responses showed a difference in the mean values of approximately 1.0 or more on the Likert scale (see Figure 1).

Summarization of these results are as follows:

1. The ADDult sample group responded with 10 out of 10 either agreeing or strongly agreeing to needing frequent breaks when studying (See Table 6, question 1). Of the control group, only three agreed or strongly agreed to needing frequent breaks when studying (see Table 7, question 1).

2. On needing reminders to complete tasks, the ADDults indicated eight agreed or strongly agreed with this question (see Table 6, question 2). In contrast, the control group had nine either disagree or strongly disagree with only one respondent agreeing with this question (see Table 7, question 2).



Table 6

Questionnaire Responses from ADDults on Learning Preferences

Questions	SD	D	U	A	SA
1. I need to take frequent breaks when I am studying.				5	5
2. I need frequent reminders to complete tasks.		2		5	3
3. I learn better with other people.	1	7	1		1
4. Noise impairs my concentration.		2	1	1	6
5. I have difficulty completing tasks.		1		5	4
6. I like to have an outline of the task I need to complete.				5	5
7. I like to eat or drink while learning.		1	1	7	1
8. I prefer learning from reading **			1	6	2
9. I prefer learning from listening **		4	1	3	1
10. I prefer learning from watching		1		4	5
11. I prefer learning from experience **				1	8
12. I have difficulties meeting instructor deadlines for completing assignments.		3	2	4	1
13. I enjoy taking notes from lectures	5	2	1	2	
14. I prefer instructors to stay away until I have completed my work.		2	1	6	1
15. I study better with background noise.	2	3	2	2	1
16. My ability to learn is affected by the lighting of the room.		3	2	4	1
17. I prefer to work alone.		1	1	5	3
18. The temperature of the room affects my ability to study.		2		5	3
19. I prefer to study lying down or in another position other than sitting up	3	5		2	
20. I feel motivated to learn.			2	2	6
21. I often change positions when I study.		1		5	4
22. I can block out background noises when I study.	4	2		2	2
23. The best time for me to learn is in the morning **		3	2		4
24. The best time for me to learn is in the afternoon **		3	1	5	
25. The best time for me to learn is in the evening **		2	2	3	2
26. The best time for me to learn is at night **		2	2	1	4
27. I have difficulty sitting and concentrating on television **	4	3		1	
28. I have difficulty sitting and concentrating on lectures	1			5	4
29. I have difficulty sitting and concentrating on computer games **	3		1	4	
30. I have difficulty sitting and concentrating on music **	5	2			1
31. I find it difficult to learn when I feel pressured.		1		3	6
32. I am easily distracted in a regular classroom.				5	5

\*\* - Some students did not answer

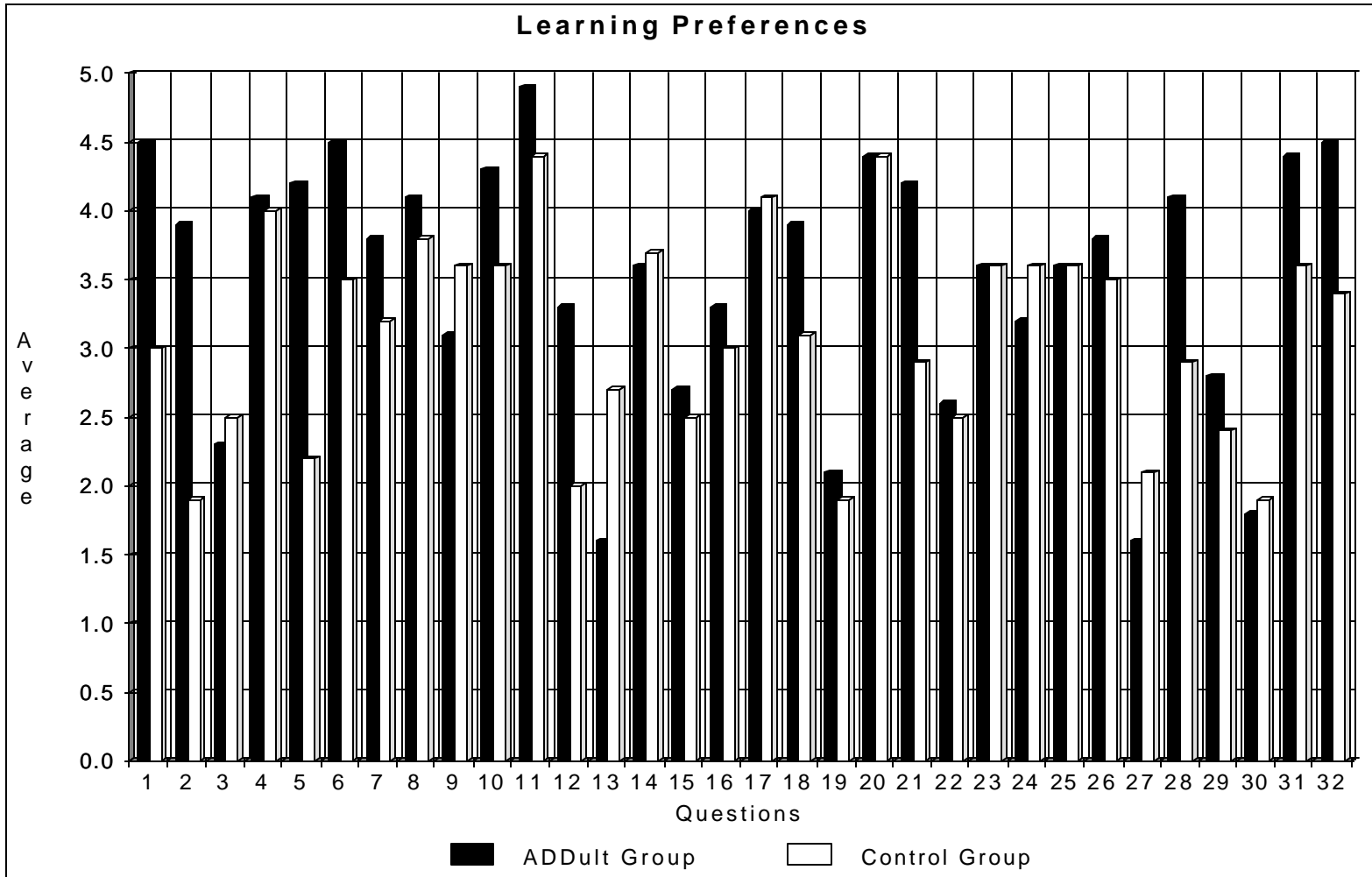
Table 7

Questionnaire Responses from Control Group on Learning Preferences

Questions	SD	D	U	A	SA
1. I need to take frequent breaks when I am studying.		5	2	1	2
2. I need frequent reminders to complete tasks.	3	6		1	
3. I learn better with other people.		6	3	1	
4. Noise impairs my concentration.		2		4	4
5. I have difficulty completing tasks.		9		1	
6. I like to have an outline of the task I need to complete.	1	1	1	6	1
7. I like to eat or drink while learning.	1	2	2	4	1
8. I prefer learning from reading.	1	1		5	3
9. I prefer learning from reading listening.		1	3	5	1
10. I prefer learning from reading watching.		2	2	4	2
11. I prefer learning from reading experience.		1		3	6
12. I have difficulties meeting instructor deadlines for completing assignments.	3	4	3		
13. I enjoy taking notes from lectures.	1	5		4	
14. I prefer instructors to stay away until I have completed my work.		1	2	6	1
15. I study better with background noise.	2	4	1	3	
16. My ability to learn is affected by the lighting of the room.	1	4		4	1
17. I prefer to work alone.		1		6	3
18. The temperature of the room affects my ability to study.	1	3	1	4	1
19. I prefer to study lying down or in another position other than sitting up	3	6		1	
20. I feel motivated to learn.				6	4
21. I often change positions when I study.	1	4	1	3	1
22. I can block out background noises when I study.	1	6		3	
23. The best time for me to learn is in the morning**	1	1	1	3	3
24. The best time for me to learn is in the afternoon**	1		1	5	1
25. The best time for me to learn is in the evening**		2	1	4	2
26. The best time for me to learn is at night **	2	1		2	3
27. I have difficulty sitting and concentrating on television.	3	5		2	
28. I have difficulty sitting and concentrating on lectures.	1	4		5	
29. I have difficulty sitting and concentrating on computer games.	3	2	3	2	
30. I have difficulty sitting and concentrating on music.	4	4	1	1	
31. I find it difficult to learn when I feel pressured.		2	2	4	2
32. I am easily distracted in a regular classroom.		4		4	2

\*\* - Some students did not answer

Figure 1



## Figure Caption

Figure 1. Mean values of the responses of the learning preference questions of the ADDult and control groups. Each response was assigned the following values: SD=1, D=2, U=3, A=4, SA=5.

Key for Question Numbers of Learning Preferences :

1. I need to take frequent breaks when I am studying.
2. I need frequent reminders to complete tasks.
3. I learn better with other people.
4. Noise impairs my concentration.
5. I have difficulty with completing tasks.
6. I like to have an outline of the task I need to complete.
7. I like to eat or drink while learning.
8. I prefer learning from reading.
9. I prefer learning from listening.
10. I prefer learning from watching.
11. I prefer learning from experience.
12. I have difficulties meeting instructor deadlines for completing assignments.
13. I enjoy taking notes from lectures.
14. I prefer instructors to stay away until I have completed my work.
15. I study better with background noise.
16. My ability to learn is affected by the lighting in the room.
17. I prefer to work alone.
18. The temperature of the room affects my ability to study.
19. I prefer to study lying down or in another position than sitting up.
20. I feel motivated to learn.
21. I often change positions when I study.
22. I can block out background noise when I study.
23. The best time for me to learn is in the morning.

24. The best time for me to learn is in the afternoon.
25. The best time for me to learn is in the evening.
26. The best time for me to learn is at night.
27. I have difficulty sitting and concentrating on television.
28. I have difficulty sitting and concentrating on lectures.
29. I have difficulty sitting and concentrating on computer games.
30. I have difficulty sitting and concentrating on music.
31. I find it difficult to learn when I feel pressured.
32. I am easily distracted in a regular classroom.

3. Another question where the ADDult group demonstrated deviations in responses to the control group was “I have difficulty completing tasks” (see Table 6, question 5). Nine of the ten ADDults either agreed or strongly agreed with this question. Conversely, the control group had nine respondents disagreeing with this question (see Table 7, question 5).

4. The ADDults indicated strongly that they liked to have an outline of the tasks they need to complete with 10 out of 10 responses agreeing (see Table 6, question 6). The control group results were not as positive with only six members agreeing (see Table 7, question 6).

5. The control group reported that they did not have difficulties meeting instructor deadlines for completing assignments with seven members either disagreeing or strongly disagreeing (see Table 7, question 12). However, the ADDults results did represent difficulties with meeting instructor deadlines for completing tasks with five respondents either agreeing or strongly agreeing (see Table 6, question 12).

6. The control group indicated a more positive response to enjoying taking notes from lectures with five agree and strongly agree answers (see Table 7, question 13). The ADDults had only two agree responses to this statement (see Table 6, question 13).

7. The responses to the temperature of the room affecting ability to study had mixed variations between the ADDults and the control group ( see Tables 6 and 7, question 18). Eight out of ten ADDults responded that they either agreed or strongly agreed. However, in the control group only five agreed or strongly agreed with four disagreeing or strongly disagreeing.

8. The results of the question “I often change positions when I study” showed a marked difference between the ADDult group and the control group (see Tables 6 and 7, question 21). The ADDults had nine agree or strongly agree responses. The control group had five disagree or strongly disagree responses.

9. Sitting and concentrating on television, lectures, computer games or music had similar responses between the ADDult and control groups except for lectures (see Tables 6 and 7, questions 28). Nine of the ADDult sample agreed or strongly agreed with having difficulty with sitting and concentrating on lectures. Of the control group only five agreed or strongly agreed with the same question.

10. More ADDults stated it was difficult to learn when they felt pressured, compared to the control group (see Table 6 and 7, question 31). Nine out of ten ADDults agreed or strongly agreed with having difficulties learning under pressure. Only six of the control group either agreed or strongly agreed.

11. The last question in this section of the survey referred to the distractibility of the students in regular classrooms (see Tables 6 and 7, question 32). ADDults responded positively to this question with 10 out of 10 either agreeing or strongly agreeing. In contrast, the control group responded with six agreeing or strongly agreeing, and four disagreeing.

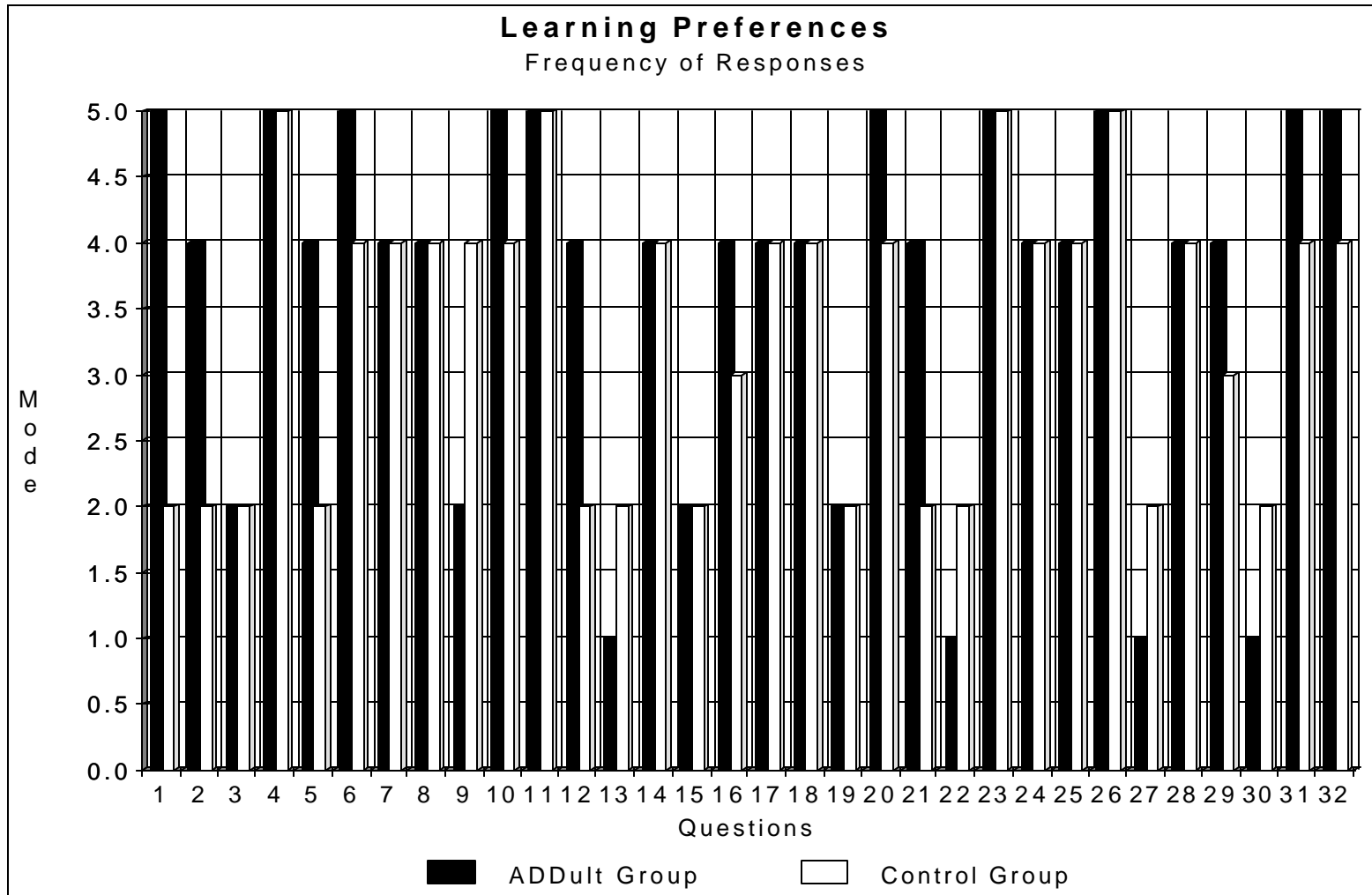
The mode values of the learning preferences responses to this section of the questionnaire (see Figure 2) on learning preferences showed that the ADDults had higher mode values on nearly 40% of the questions. The control groups' responses had 15% higher mode values than the ADDults on the following learning preference questions:

1. I prefer learning from listening (see Figure 2, question 9).
2. I enjoy taking notes from lectures (see Figure 2, question 13).
3. I can block out background noise when I study (see Figure 2, question 22).
4. I have difficulty sitting and concentrating on television (see Figure 2, question 27).
5. I have difficulty sitting and concentrating on music (see Figure 2, question 30).

The learning preference questions were classified as either relating to distance education or neutral. Table 8 depicts the classification of learning preference questions specific to distance education and neutral questions. Figure 3 illustrates the ADDult and control group learning preference responses specific to distance education by mean values in a bar graph. The results indicate that ADDults had higher mean values for 13 out of 15 questions that were related to distance education. Of these 13 specific learning preference questions as related to distance education, 40% of the responses showed a difference in the mean values of approximately 1.0 or more on the Likert scale (see Figure 3).



Figure 2



## Figure Caption

Figure 2. Mode values of the responses of the learning preference questions of the ADDult and control groups. Each response was assigned the following values: SD=1, D=2, U=3, A=4, SA=5.

Key for Question Numbers on Learning Preferences :

1. I need to take frequent breaks when I am studying.
2. I need frequent reminders to complete tasks.
3. I learn better with other people.
4. Noise impairs my concentration.
5. I have difficulty with completing tasks.
6. I like to have an outline of the task I need to complete.
7. I like to eat or drink while learning.
8. I prefer learning from reading.
9. I prefer learning from listening.
10. I prefer learning from watching.
11. I prefer learning from experience.
12. I have difficulties meeting instructor deadlines for completing assignments.
13. I enjoy taking notes from lectures.
14. I prefer instructors to stay away until I have completed my work.
15. I study better with background noise.
16. My ability to learn is affected by the lighting in the room.
17. I prefer to work alone.
18. The temperature of the room affects my ability to study.
19. I prefer to study lying down or in another position than sitting up.
20. I feel motivated to learn.
21. I often change positions when I study.
22. I can block out background noise when I study.

23. The best time for me to learn is in the morning.
24. The best time for me to learn is in the afternoon.
25. The best time for me to learn is in the evening.
26. The best time for me to learn is at night.
27. I have difficulty sitting and concentrating on television.
28. I have difficulty sitting and concentrating on lectures.
29. I have difficulty sitting and concentrating on computer games.
30. I have difficulty sitting and concentrating on music.
31. I find it difficult to learn when I feel pressured.
32. I am easily distracted in a regular classroom.

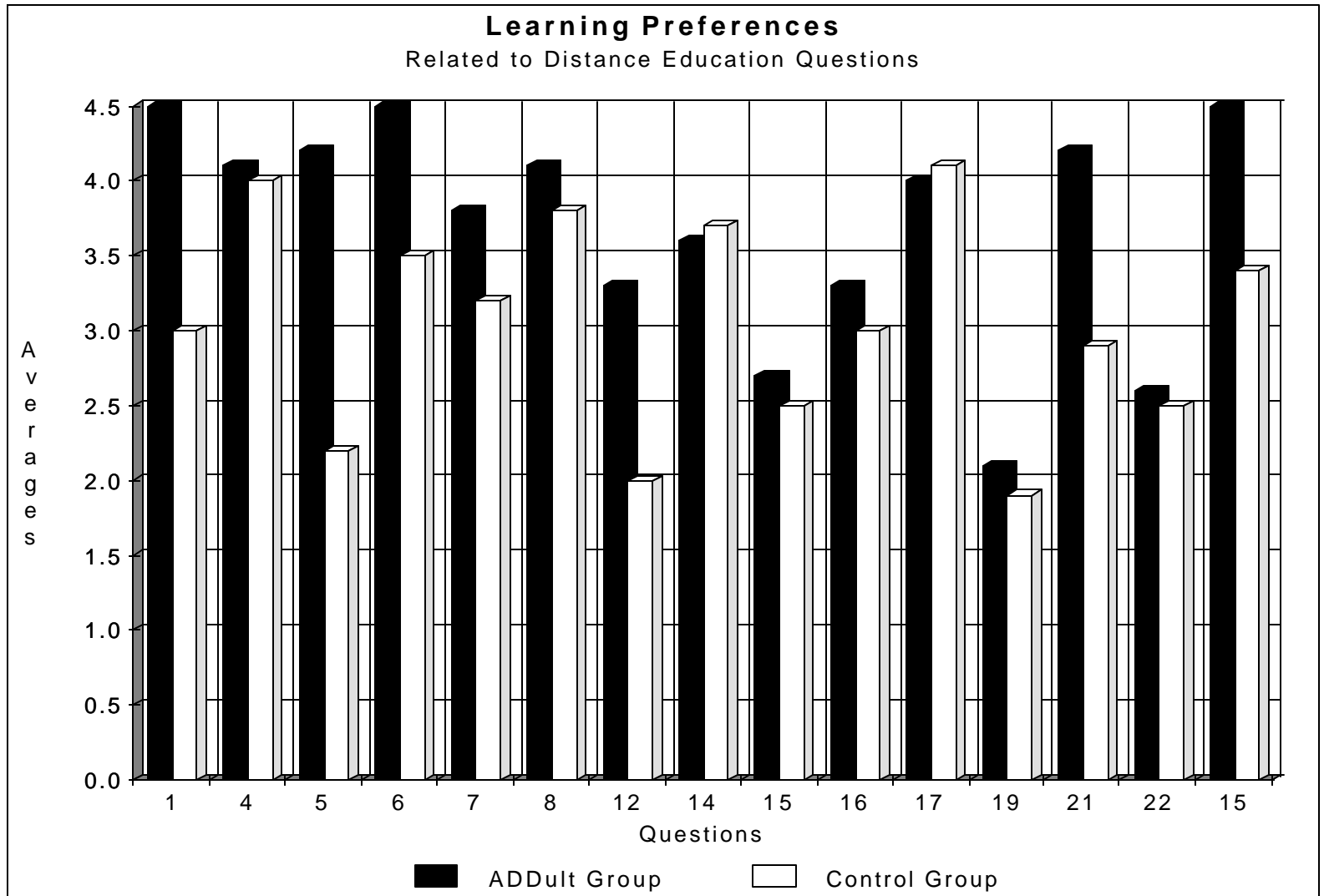
Table 8

Learning Preference Questions Classified as related to Distance Education or Neutral

Distance Education Related Questions	Neutral Related Questions
1. I need to take frequent breaks when I am studying.	2. I need frequent reminders to complete tasks.
4. Noise impairs my concentration.	3. I learn better with other people
5. I have difficulty completing tasks.	9. I prefer learning from listening, watching, or experience.
6. I like to have an outline of the task I need to complete.	10. I prefer learning from watching.
7. I like to eat or drink while learning.	11. I prefer learning from experience.
8. I prefer learning from reading.	13. I enjoy taking notes from lectures.
12. I have difficulties meeting instructor deadlines for completing assignments.	18. The temperature of the room affects my ability to study.
14. I prefer instructors to stay away until I have completed my work.	20. I feel motivated to learn.
15. I study better with background noise.	23. The best time for me to learn is in the morning.
16. My ability to learn is affected by the lighting of the room.	24. The best time for me to learn is: in the afternoon.
17. I prefer to work alone.	25. The best time for me to learn is: in the evening.
19. I prefer to study lying down or in another position other than sitting up.	26. The best time for me to learn is at night.
21. I often change positions when I study.	27. I have difficulty sitting and concentrating on television.
22. I can block out background noises when I study.	28. I have difficulty sitting and concentrating on lectures.
32. I am easily distracted in a regular classroom.	29. I have difficulty sitting and concentrating on computer games.
	30. I have difficulty sitting and concentrating on music.
	31. I find it difficult to learn when I feel pressured

Note. The numbering of the questions above corresponds with the numbering of questions in Figures 1 and 2.

Figure 3



## Figure Caption

Figure 3. Mean values of the responses for the reasons for participating in Distance Education courses for the ADDult and control groups. Each response was assigned the following values: SD=1, D=2, U=3, A=4, SA=5.

Key for Question Numbers for Reasons for Participating in Distance Education Courses (the numbering of these questions corresponds with Table 8):

1. I need more time for learning than is permitted in conventional education courses.
4. Noise impairs my concentration.
5. I have difficulty with completing tasks.
6. I like to have an outline of the task I need to complete.
7. I like to eat or drink while learning.
8. I prefer learning from reading.
12. I have difficulties meeting instructor deadlines for completing assignments.
14. I prefer instructors to stay away until I have completed my work.
15. I study better with background noise.
16. My ability to learn is affected by the lighting in the room.
17. I prefer to work alone.
19. I prefer to study lying down or in another position than sitting up.
21. I often change positions when I study.
22. I can block out background noise when I study.
32. I am easily distracted in a regular classroom.

The responses that demonstrated these mean value differences of approximately 1.0 or more on the Likert scale for the specific learning preference questions as related to distance education were:

1. I need to take frequent breaks when studying (see Figure 3, question 1).
2. I have difficulty completing tasks (see Figure 3, question 5).
3. I like to have an outline of the task that I need to complete (see Figure 3, question 6).
4. I have difficulties meeting instructor deadlines for completing assignments (see Figure 3, question 12).
5. I often change positions when I study (see Figure 3, question 21).
6. I am easily distracted in a regular classroom (see Figure 3, question 32).

The mode values of the ADDults' responses for learning preferences for these same six questions were also higher than the control group responses (see Figure 2, questions 1,5,6,12,21 and 32).

Statistical analysis. A t-test for Equality of Means was performed comparing ADDults and the control groups' responses on the learning preference questions. Eight questions in the learning preference section of the questionnaire showed significant differences between the ADDult and control group (see Table 9). 75% of these eight questions indicated that the ADDults had higher mode values and higher mean values of approximately 1.0 or more on the Likert scale than the control group for the specific learning preference questions related to distance education (see Table 9 and Figures 2 and 3, questions 1,5,6,12, 21, and 32 ).

Table 9

Summary of the Significant Differences between the ADDult and Control Groups' Responses on Learning Preferences

Questions	ADDult Groups' Mean Values	Control Groups' Mean Values	T- value	Degrees of Freedom	Significance Level (2-tailed)
1. I need to take frequent breaks when I am studying	4.5	3.0	3.503	18	.003
2. I need frequent reminders to complete tasks.	3.9	1.8	4.632	18	.000
5. I have difficulty with completing tasks.	4.2	2.6	5.669	18	.000
6. I like to have an outline of the task that I need to complete.	4.5	3.5	2.449	18	.025
12. I have difficulties meeting instructor deadlines for completing assignments.	3.3	2.0	3.074	18	.007
21. I often change positions when I study.	4.2	2.9	2.600	18	.018
28. I have difficulty sitting and concentrating on lectures.	4.1	2.9	2.241	18	.038
32. I am easily distracted in a regular classroom.	4.5	3.4	2.538	18	.021

Note. The numbering of the questions above corresponds with the numbering of questions in Figures 1, 2 and 3.



## Reasons for participating in distance education courses

Descriptive analysis. This section of the survey administered to the ADDult and the control groups on reasons for participating in distance education courses consisted of 14 closed questions and one open question. The 14 closed questions had 5 subsection questions for a total of 19 closed questions with the last question specific to the ADDults only (see Tables 10 and 11). The responses to the closed questions were ranked the same as in the learning preference section:

SD - strongly disagree, D - disagree, U - undecided, A - agree, SA- strongly agree.

It is to be noted that that the ADDult group did not answer any of the questions in this section of reasons for participating in distance education courses with a strongly disagree response (see Table 10).

In examining the responses to the survey questions on reasons for participating in distance education courses, the ADDult had higher mean values for all of their responses compared to the control group. 40% of the responses to the questions on reasons for participating in distance education courses showed a difference in mean values of approximately 1.0 or more on the Likert scale between the ADDults and control group (see Figure 4).

Table 10

Questionnaire Responses from ADDults on Reasons for Participating in Distance Education Courses

QUESTIONS	SD	D	U	A	SA
1. I need more time for learning than is permitted in conventional education courses.		2	1	4	3
2. I prefer having course materials available prior to course commencement			2	5	3
3. I prefer having a textbook with an accompanying study guide.			1	5	4
4. I prefer study guides that emphasize objectives, key concepts, and provide overview of the content.		1		4	5
5. I prefer having access to exam review questions as offered in study guides.			1	3	6
6. I prefer a study environment for learning that reduces auditory and visual distractions.			1	3	6
7. The flexibility of distance education courses played a role in choosing to take these courses.				3	7
8. My preference of study location played a role in choosing to take these courses.			1	4	5
9. Individualization of instruction played a role in choosing to take these courses 'em		2	1	4	2
10. Variations in the amount of instruction played a role in choosing to take these courses **			2	5	2
11. . variations in the time to complete courses played a role in choosing to take these courses **			1	5	3
12. Variations in the amount of feedback played a role in choosing to take these courses		3	3	2	2
13. Variations in the amount of interaction played a role in choosing to take these courses **		1	1	4	3
14. Variations in the requirements for interaction played a role in choosing to take these courses **		2		4	3
15. The availability of technology in distance education courses played a role in choosing to take these courses		2	1	4	3
16. The instructional methods used in distance education played a role in choosing to take these courses			1	5	4
17. The instructional methods used in distance education assisted me to master the course objectives			2	7	1
18. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods.		1		5	4
19. Answer this question only if you have Attention Deficit Disorder (ADD): Having ADD played a role in choosing to take distance education courses.		3	1	2	4

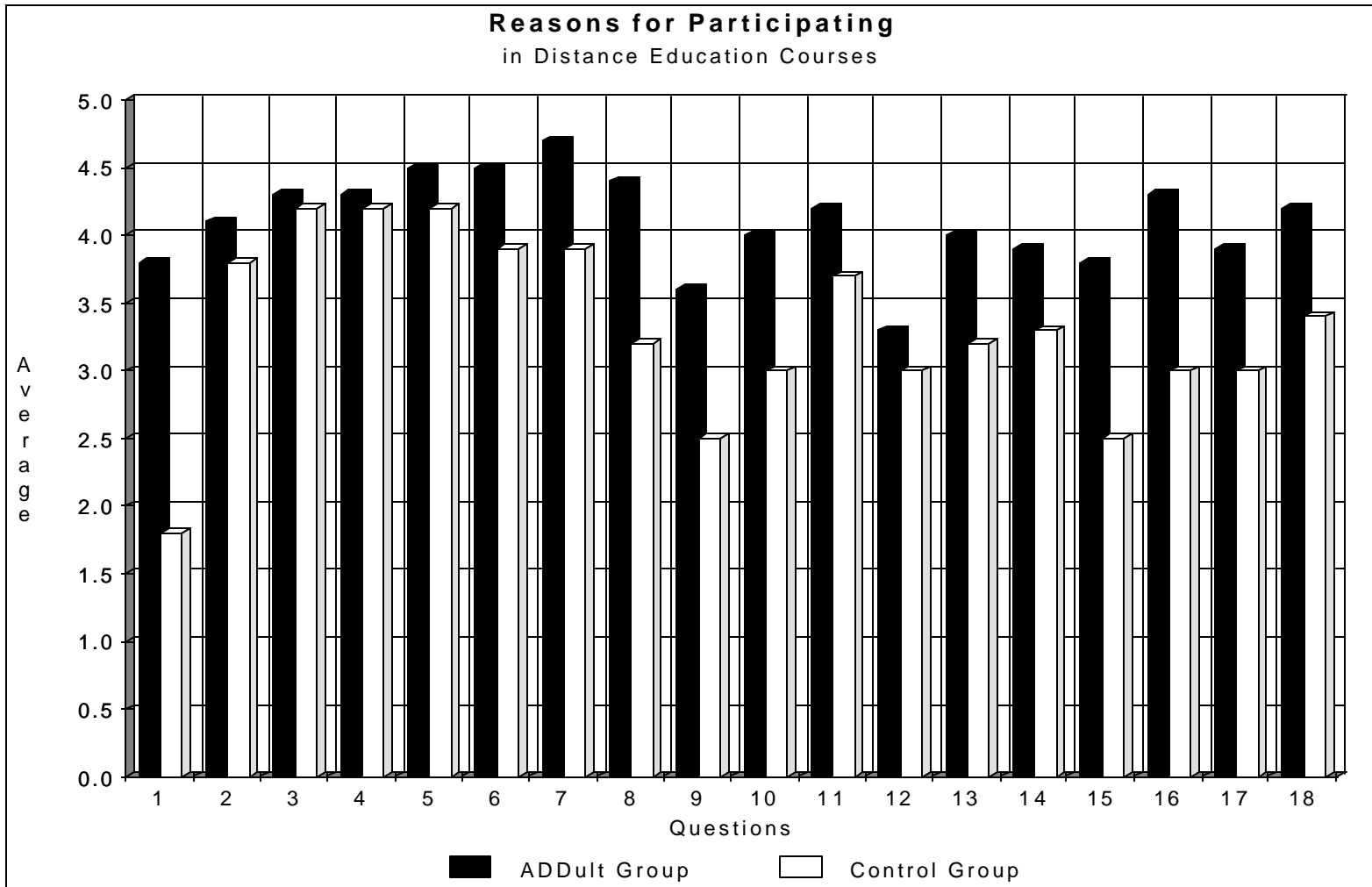
\*\* - Some students did not answer

Table 11

Questionnaire Responses from Control Group on Reasons for Participating in Distance Education Courses

Questions	SD	D	U	A	SA
1. I need more time for learning than is permitted in conventional education courses.	3	6	1		
2. I prefer having course materials available prior to course commencement		1	1	7	1
3. I prefer having a textbook with an accompanying study guide.			1	6	3
4. I prefer study guides that emphasize objectives, key concepts, and provide overview of the content.			1	6	3
5. I prefer having access to exam review questions as offered in study guides.		1		5	4
6. I prefer a study environment for learning that reduces auditory and visual distractions.		1	1	6	2
7. The flexibility of distance education courses played a role in choosing to take these courses.	2			3	5
8. My preference of study location played a role in choosing to take these courses.	2	1	2	4	1
9. Individualization of instruction played a role in choosing to take these courses	3	3		4	
10. Variations in the amount of instruction played a role in choosing to take these courses	1	3	3	3	
11. Variations in the time to complete courses played a role in choosing to take these courses	1		1	7	1
12. Variations in the amount of feedback played a role in choosing to take these courses	1	3	1	5	
13. Variations in the amount of interaction	1	1	3	5	
14. Variations in the requirements for interaction played a role in choosing to take these courses	1	1	2	6	
15. The availability of technology in distance education courses played a role in choosing to take these courses	3	4		1	2
16. The instructional methods used in distance education played a role in choosing to take these courses	2	2	2	2	2
17. The instructional methods used in distance education assisted me to master the course objectives	1	3	2	3	1
18. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods.		2	2	6	
19. Answer this question only if you have Attention Deficit Disorder (ADD): Having ADD played a role in choosing to take distance education courses.					

Figure 4



## Figure Caption

Figure 4. Mean values of the responses for the reasons for participating in Distance Education courses for the ADDult and control groups. Each response was assigned the following values: SD = 1, D = 2, U = 3, A = 4, SA = 5.

### Key for Question Numbers for Reasons for Participating in Distance Education

#### Courses:

1. I need more time for learning than is permitted in conventional education courses.
2. I prefer having course materials available prior to course commencement.
3. I prefer having a textbook with an accompanying study guide.
4. I prefer study guides that emphasize objectives, key concepts, and provide an overview of content.
5. I prefer having access to exam review questions as offered in the study guides.
6. I prefer a study environment for learning that reduces auditory and visual distractions.
7. The flexibility of distance education courses played a role in choosing to take these courses.
8. My preference of study locations played a role in choosing to take these courses.
9. Individualization of instruction played a role in choosing to take these courses.
10. Variations in the amount of instruction played a role in choosing to take these courses.
11. Variations in the time to complete courses played a role in choosing to take these courses.

12. Variations in the amount of feedback played a role in choosing to take these courses.
13. Variations in the amount of interaction played a role in choosing to take these courses.
14. Variations in the requirements for interaction played a role in choosing to take these courses.
15. The availability of technology in distance education courses played a role in choosing to take these courses.
16. The instructional method used in distance education played a role in choosing to take these courses.
17. The instructional methods used in distance education assisted me to master the course objectives.
18. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods.

Summarization of results with differences in mean values of approximately 1.0 or more on the Likert scale between the ADDults and control group on reasons for participating in distance education courses are as follows:

1. The ADDult sample group responded with seven either agreeing or strongly agreeing to needing more time for learning than is permitted in conventional education courses(see Table 10, question 1). In comparison, the control group had nine respondents disagreed or strongly disagreed this same question (see Table 11, question 1).

2. The ADDults responded with 10 out of 10 either agreeing or strongly agreeing that flexibility of distance education courses played a role in choosing to take these courses (see Table 10, question 7). The control group had eight members agreeing or strongly agreeing (see Table 11, question 7).

3. Preference of study location playing a role in choosing to take distance courses with nine out of the ten ADDults either agreeing or strongly agreeing (see Table 10, question 8). In comparison, the control group had five members who either agreed or strongly agreed (see Table 11,question 8).

4. The availability of technology in distance education played a major role for ADDults in choosing to take these courses, with seven either agreeing or strongly agreeing (see Table 10,question 15). With the control group, seven members stated they disagreed or strongly disagreed with this question (See Table 11, question 15).

5. The instructional methods used in distance education played a role in choosing to take these courses for nine out of ten ADDults who either agreed or

strongly agreed (see Table 10, question 16). In comparison, the control group had four members who agreed or strongly agreed (see Table 11, question 16).

6. ADDults agreed (eight out of ten stating agree or strongly agree) that the instructional methods used in distance education assisted them to master the course objectives (see Table 10, question 17). Only four out of ten in the control group had the same response (see Table 11, question 17).

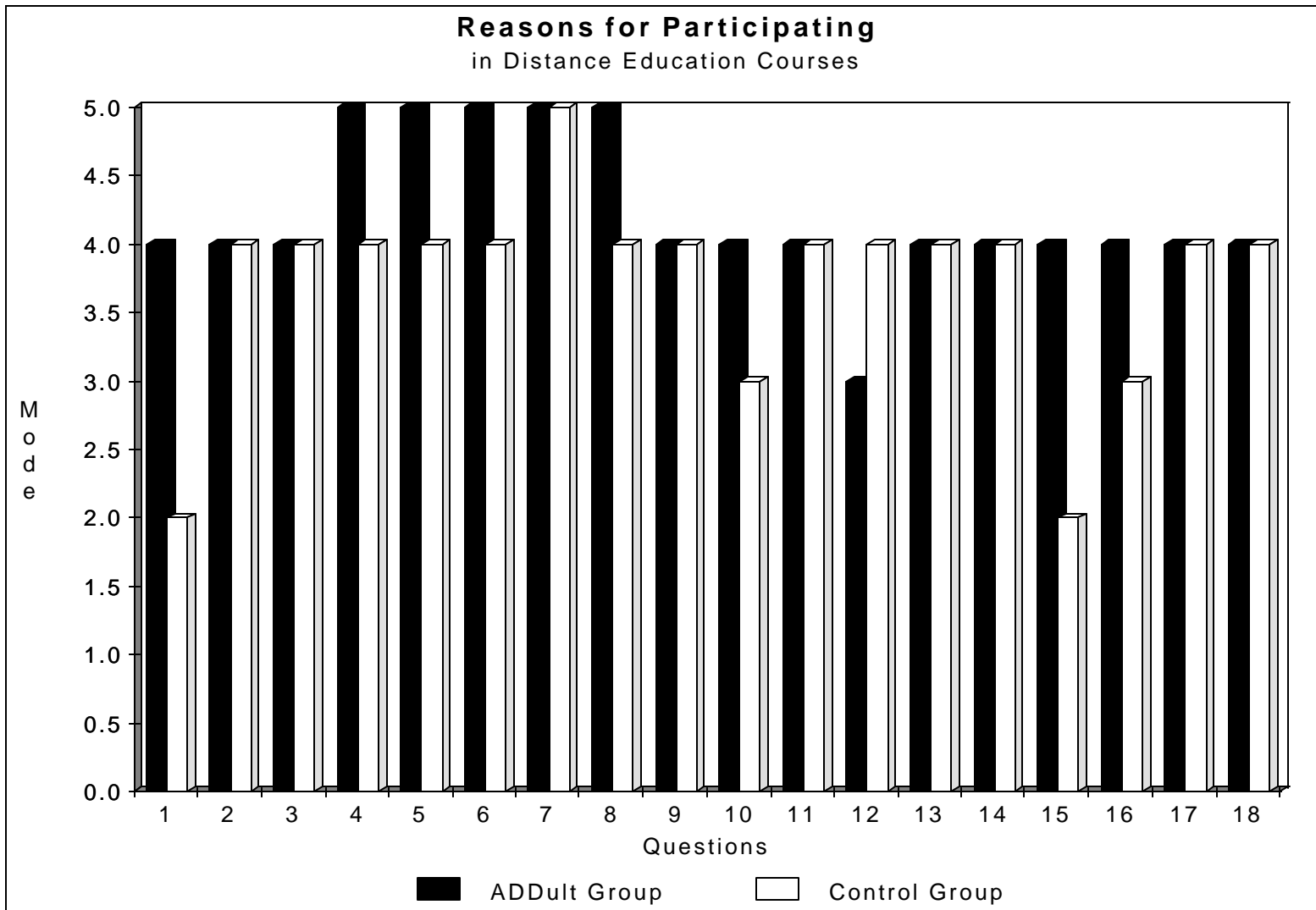
7. Preference of the instructional methods of distance education compared to conventional lecture methods was responded to positively by nine of the ADDults either agreeing or strongly agreeing (see Table 10, question 18). Only six of the control group agreed, with no members strongly agreeing (see Table 11, question 18).

The last closed question in this section was relevant only to the ADDults. It stated “Having ADD played a role in choosing to take distance education courses” (see Table 10, question 19). The ADDult group responded favorably to this question with six agreeing or strongly agreeing.

The mode values of the reasons for participating in distance education courses responses (see Figure 5) showed that the ADDults had higher mode values on nearly 45% of the questions. The only control group response that had a higher mode value than the ADDults was related to variations in the amount of feedback (see Figure 5, question 12).



Figure 5



## Figure Caption

Figure 5. Mode values of the responses for the reasons for participating in Distance Education courses for the ADDult and control groups. Each response was assigned the following values: SD = 1, D = 2, U = 3, A = 4, SA = 5.

### Key for Question Numbers for Reasons for Participating in Distance Education

#### Courses:

1. I need more time for learning than is permitted in conventional education courses.
2. I prefer having course materials available prior to course commencement.
3. I prefer having a textbook with an accompanying study guide.
4. I prefer study guides that emphasize objectives, key concepts, and provide an overview of content.
5. I prefer having access to exam review questions as offered in the study guides.
6. I prefer a study environment for learning that reduces auditory and visual distractions.
7. The flexibility of distance education courses played a role in choosing to take these courses.
8. My preference of study locations played a role in choosing to take these courses.
9. Individualization of instruction played a role in choosing to take these courses.
10. Variations in the amount of instruction played a role in choosing to take these courses.
11. Variations in the time to complete courses played a role in choosing to take these courses.

12. Variations in the amount of feedback played a role in choosing to take these courses.
13. Variations in the amount of interaction played a role in choosing to take these courses.
14. Variations in the requirements for interaction played a role in choosing to take these courses.
15. The availability of technology in distance education courses played a role in choosing to take these courses.
16. The instructional method used in distance education played a role in choosing to take these courses.
17. The instructional methods used in distance education assisted me to master the course objectives.
18. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods.

The responses to the open-ended question on primary reasons for enrolling in distance education courses are summarized in Table 12. Anecdotal evidence supports the survey results, that the primary reasons stated for ADDults enrolling in distance education courses/programs were related to control and pacing engendered in the instructional strategies of distance education (see Table 13).

Anecdotal evidence of the responses of the control group to the same open-ended question on primary reasons for enrolling in distance education courses/program revolved around convenience (see Table 13).

Statistical analysis. A t-test for Equality of Means was performed comparing ADDults and the control groups' responses on the questions on reasons for participating in distance education courses. 45% of the questions on reasons for participating in distance education courses showed significant differences between the ADDult and control group (see Table 12). Of these questions that showed significant differences, over 60% were the same questions that the ADDults had higher mode values and higher mean values of approximately 1.0 or more on the Likert scale than the control group for reasons for participating in distance education courses (see Table 12 and Figures 4 and 5, questions 1,8,10,15, and 16).

Table 12

Primary Reasons for ADDults to Enroll in Distance Education Courses/Programs:

ADDult Group	Control Group
<p>1. a. Personal control of all distractions                      b. If I fail, I fail alone                      c. Performance anxiety                      d. I work to my time line.                      e. I'm generally just a number/anonymous.</p>	<p>1. I needed one more class to complete my Bsc (sic) at the U of Calgary.</p>
<p>2. I think I always enrolled in DE courses because of my attention deficit but when I didn't know that that was what I had, I had no idea where my roots of my difficulties were, therefore I had no strategies for overcoming them. It was discovering that I have ADD that made it possible for me to try this distance learning thing again and also gave me some clues as to the strategies I could use.</p>	<p>2. Because I work full time and have three children under the age of 9 - I choose distance education as it allows me to determine the time available to study - and be flexible for same. It also allows me to study at home rather than having to attend class - using up time traveling to and from locations</p>
<p>3. Control . . .</p>	<p>3. Flexibility</p>
<p>4. The courses allowed active participation. The course format allowed me to work at my own pace. The program help (sic) with time management and meeting deadlines.</p>	<p>4. Fits into my schedule. Work at my own pace. Need to continue full-time employment while attending University. Evening courses conflict with shift work.</p>
<p>5. At first it was because I lived in the Arctic. Study at my own pace. Flexibility allowed me to remain at home with my children. To avoid course registration at regular university. To avoid wasting time traveling to university. Wonderful tutor support I receive at A.U.</p>	<p>5. Work full-time days                      Variety of courses available</p>
<p>6. One of the main reasons that I had chosen to take these classes over the Internet is because, I have the freedom to be able to proceed at my own pace. I have a hard time concentrating in many classrooms and so when this option came</p>	<p>6. I can take a course and apply it to my job thus learning the course in a more complete way. Being a "mom" and wife I need to be able to have my own schedule on when to sit down and do my studies. Less distractions through</p>

up, I grabbed it!	home study.
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ADDult Group	Control Group
<p>7. A. Was not accepted into Psyc (sic) program at U of C because I wanted to apply credits from a previous degree to this one, and my Grade Point Average from previous degree was too low. Athabasca allowed my previous credits without hesitation!</p> <p>B. Other reason was so that I would not have to relocate, which would separate my son from his father, as we are divorced. To me there was no option. I would prefer to actually be in a classroom situation, as I find it helps keep the motivation level up, and the interaction with other students strengthens the learning material. I take courses during the Spring/Summer session at U of C to get this interaction, and try to take AU courses that offer some interaction (i.e. workshops).</p>	<p>7. I did not complete the one course that I had taken in distance education. I chose to take this course last summer, to ease my course load in the fall. It was the only available way of taking it in the summer. In the end it did not help, because I did not finish it. I am very motivated full time student at Grant MacEwan. I will have completed my program at the end of March, other than this course. I do not have the discipline to learn with distance education programs. I have very high marks at Grant MacEwan and always get my assignments in on time. I also would rather work at home, than work at school. Which once again, does not make sense that I cannot complete a distance education course.</p>
<p>8. Flexibility in learning schedule - learning mostly at my own pace and convenience. Comfort of taking class from home. Reduce time spent on campus, and travel time.</p>	<p>8. Convenience (sic), wonderful course design, easy access to information, great university personnel, wonderful communication system.</p>
<p>9. The courses I took were available at inconvenient times through conventional educational programs. Distance ED. (sic) offered much more flexibility in scheduling and also task completion deadlines.</p>	<p>9. I found it very convenient (sic).</p>
<p>10. Live in rural area. No course like these available here. The Internet connects me to an instructor ASAP. I can study at my own pace and fit it around my (insane at times) lifestyle.</p>	<p>10. My husband and I live in a rural community. I completed a degree at the University of Alberta and if the opportunity was available I would much prefer to complete this degree the same way I needed one more class to complete my Bsc</p>

	(sic) at the U of Calgary
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Table 13

Categories of the Primary Reasons for ADDults to Enroll in Distance Education Courses/Programs

ADDult Group	Control Group
<p style="text-align: center;"><b><u>Pacing:</u></b></p> <ol style="list-style-type: none"> <li>1. The course format allowed me to work at my own pace.</li> <li>2. Study at my own pace.</li> <li>3. I have the freedom to be able to proceed at my own pace.</li> <li>4. . . .learning mostly at my own pace and convenience.</li> <li>5. . . . offered much more flexibility in scheduling and also task completion deadlines.</li> <li>6. I can study at my own pace.</li> </ol> <p style="text-align: center;"><b><u>Control:</u></b></p> <ol style="list-style-type: none"> <li>1. Personal control of all distractions.</li> <li>2. It was discovering that I have ADD that made it possible for me to try this distance learning thing again and also gave me some clues as to the strategies I could use.</li> <li>3. Control</li> </ol>	<p style="text-align: center;"><b><u>Convenience:</u></b></p> <ol style="list-style-type: none"> <li>1. I needed one more class to complete my Bsc (sic) at the U of Calgary.</li> <li>2. Work full time days. Variety of courses offered.</li> <li>3. Fits into my own schedule.</li> <li>4. Flexibility.</li> <li>5. Being a “mom” and wife I need to be able to have my own schedule on when to sit down and do my studies.</li> <li>6. Convience (sic) . . . easy access to information . . .</li> <li>7. I found it very convenient (sic).</li> <li>8. It was the only way of taking it in the summer.</li> <li>9. . . . it allows me to determine the time available to study - and be flexible for same.</li> </ol>

Note. The categories were derived from the responses of the primary reasons for ADDults enrolling in distance education courses/programs stated in Table 12.



Table 14

Summary of the Significant Differences between the ADDult and Control Group on Reasons for Participating in Distance Education Courses

t-test for Equality of Means

Questions	ADDult Groups' Mean Values	Control Groups' Mean Values	T-value	Degrees of Freedom	Significance Level (2-tailed)
1. I need more time for learning than is permitted in conventional education courses.	3.8	1.8	4.867	18	.000
8. My preference of study location played a role in choosing to take these courses.	4.4	3.1	2.672	18	.016
9. Individualization of instruction played a role in choosing to take these courses.	3.6	2.5	2.012	18	.059
10. Variations in the amount of instruction played a role in choosing to take these courses.	3.9	2.8	2.741	18	.013
15. The availability of technology in distance education courses played a role in choosing to take these courses.	3.8	2.5	2.112	18	.049
16. The instructional methods used in distance education played a role in choosing to take these courses.	4.3	3.0	2.512	18	.022
17. The instructional methods used in distance education assisted me to master the course objectives.	3.9	3.0	2.077	18	.052
18. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods.	4.2	3.4	2.028	18	.058

Note. The numbering of the questions above corresponds with the numbering of questions in Figures 4 and 5.

## CHAPTER IV

### DISCUSSION

#### Demographics

The demographic data of the ADDult independent sample group and the random independent control group were similar. Each group had ten distance learners who responded to the same survey questions on a voluntary basis.

The ADDult and the control groups were not restricted to any specific age or gender. Each group had representation of both genders and different age ranges (see Table 3 and 4). The control groups did not have any representation in the 40 - 49 age range.

The ADDult and the control group's demographic data suggested that both groups successfully participated in distance education courses at various levels of study. The control group had representation at the University 100 - 400 levels while ADDults represented all course levels except University 500 level (see Table 3 and 4).  
rate

The demographic data on the ADDults living in urban areas and rural was the same as the control group (see Table 4). 70% of both the ADDult and control group respondents resided in urban areas where there is the possibility of increased access to conventional education courses. Therefore, the aspect of distance (time and place arrangements) may not be a factor in choosing distance education courses.

Employment results of the demographic data indicated that the ADDults and the control group had similar representation in each of the categories of full time, part time

and unemployed (see Tables 3 and 4). The number of responses for part time employment was equal between the two groups.

The demographic data on student status suggested scant differences between the ADDults and the control group (see Tables 3 and 4). In both groups, the number of responses of part time students compared to the number of responses of full time students was almost doubled.

The results of the demographics analysis indicate that the ADDults and the control group are enrolling in distance education courses that include technology in their instructional methods. The ADDult group responses indicated that more of the ADDults were taking distance education courses using technologies than the control group (see Table 4).

Although ADDults have learning differences, their responses to future educational plans were similar to those of the control group (see Table 5). The responses to educational goals of both groups were not restricted to a specific educational level but were as varied as any distance learner.

The results of the demographics section of the survey suggest that the ADDult sample group and the control group were comparable. Although ADDults have specific learning differences and may require compensatory strategies in their learning environments (Vogel, 1987), the demographic data of ADDults as distance learners was analogous to the control group.

### Learning preferences

The learning preference section of the survey questionnaire was developed on specific questions relating to distance education and ADD. Learning preference

models such as *Canfield Learning Styles Inventory* (Canfield & Canfield, 1978), *Renzulli/Smith Learning Style Inventory* (Renzulli & Smith, 1978) and the Dunn, Dunn, and Price (1982) *Productivity Environmental Preference Survey* were not used to measure preferences as they were not specifically structured to measure either distance education or ADD.

The ADDults had higher mean response values for 19 out of the 32 questions. 35% of the ADDults' responses on the learning preference questions had a mean response value greater than 1.0 on the Likert scale than the control group. These same learning preference responses of the ADDults that had a difference of 1.0 or more on the Likert scale also had higher mode response values than the control group.

Eight responses to the learning preference questions indicated significant differences between the ADDults and the control group, using the t-test for Equality of Means. Of these eight responses, seven questions had ADDults having a higher mean response values with a difference of 1.0 or more on the Likert scale and also higher mode response values than the control group.

The seven questions of the learning preference section of the questionnaire with significant differences and having ADDults with a higher mean response values of 1.0 or more on the Likert scale and also higher mode response values than the control group were:

1. I need to take frequent breaks when I am studying (see Figure1, question 1).
2. I need frequent reminders to complete tasks (see Figure 1, question 2).
3. I have difficulty completing tasks (see Figure 1, question 5).

4. I like to have an outline of the task I need to complete (see Figure 1, question 6).

5. I have difficulties meeting instructor deadlines for completing assignments (see Figure 1, question 12).

6. I often change positions when I study (see Figure 1, question 21).

7. I am easily distracted in a regular classroom (see Figure 1, question 32).

The one question with a significant difference between the ADDults and the control group that also had a higher mean response value with a difference of 1.0 or more on the Likert scale for the ADDults but a lower mode response value than the control group was “I have difficulty sitting and concentrating on lectures” (see Figure 2, question 28). Of the eight significantly different responses to the learning preference questions between ADDults and the control group, six were classified as relating specifically to distance education (see Figure 3, questions 1, 5, 6, 12, 21, and 32).

The literature indicates that the learning preferences of ADDults include a learning environment that is structured, free of distractions, and allows for mobility (McCormick & Leonard, 1994). The learning preference responses related specifically to distance education with significant differences between the ADDult and control groups are suggestive of the learning preferences of ADDults as described in the literature:

1. Structure - I like to have an outline of the task I need to complete (see Figure 1, question 6).

2. Free of distractions - I am easily distracted in a regular classroom (see Figure 1, question 32).

3. Mobility - (a) I need to take frequent breaks when I am studying (see Figure 1, question 1); (b) I often change positions when I study (see Figure 1, question 21).

4. Timing/pacing - (a) I have difficulty completing tasks (see Figure 1, question 5); (b) I have difficulties meeting instructor deadlines for completing assignments (see Figure 1, question 12).

### Reasons for participating in distance education courses

The questions on reasons for participating in distance education courses were written to reflect instructional strategies recommended by Javorsky and Gussin (1994) for ADDults (see Tables 9 and 10). The ADDults' results for this section of the survey had greater mean response values than the control group for all questions (see Figure 3). 40% of the responses to the questions on reasons for participating in distance education courses showed a difference in mean response values of approximately 1.0 or more on the Likert scale between the ADDult and the control group.

Eight responses to the reasons for participating in distance education courses had significant differences between the ADDults and the control group, using the t-test for Equality of Means. Of these eight responses, five questions indicated ADDults having a higher mean response values with a difference of 1.0 or more on the Likert scale and also higher mode response values than the control group. The remaining three questions that had a significant difference also had ADDults having a higher mean response values with a difference of 1.0 or more on the Likert scale than the control group and the same mode response values.

The eight questions with significant difference in the reason for participating in distance education courses section of the questionnaire were:

1. I need more time for learning than is permitted in conventional education courses (see Table 14, question 1).

2. My preference of study location played a role in choosing to take these courses (see Table 14, question 8).

3. Individualization of instruction played a role in choosing to take these courses (see Table 14, question 9).

4. Variations in the amount of instruction played a role in choosing to take these courses (see Table 14, question 10).

5. The availability of technology in distance education courses played a role in choosing to take these courses (see Table 14, question 15).

6. The instructional methods used in distance education played a role in choosing to take these courses (see Table 14, question 16).

7. The instructional methods used in distance education assisted me to master the course objectives (see Table 14, question 17).

8. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods (see Table 14, question 18).

From the responses to the questions with significant difference on reasons for participating in distance education courses, the ADDults indicated that they preferred the distance education instructional strategies that allowed physical and psychological access as described in the literature. These instructional strategies included:

1. Time/pacing - I need more time for learning than is permitted in conventional education courses (see Table 14, question 1).

2. Control over the environment and instruction - (a) My preference of study location played a role in choosing to take these courses (see Table 14, question 8); (b) Individualization of instruction played a role in choosing to take these courses (see Table 14, question 9); (c) Variations in the amount of instruction played a role in choosing to take these courses (see Table 14, question 10); (d) The instructional methods used in distance education played a role in choosing to take these courses (see Table 14, question 16); (e) The instructional methods used in distance education assisted me to master the course objectives (see Table 14, question 17).

3. Technology - The availability of technology in distance education courses played a role in choosing to take these courses (see Table 14, question 15).

Results of the open-ended question requesting the ADDults and the control group to list their primary reasons for enrolling in distance education courses/programs supported the responses of the reasons for participating in distance education courses. The ADDult responses to this open-ended question were related to pacing and control (see Tables 11 and 12).

When the ADDults were asked specifically if having ADD played a role in choosing to take distance education courses, a majority (60% agreed or strongly agreed and 10% were uncertain) of the ADDults agreed with this question (see Table 9, question 14). This implies that the learning needs of ADDults played a role in choosing to take distance education courses.



### Implications of the study.

The results of the survey suggest that distance education instructional strategies may provide a learning environment for ADDults that allows for “. . . flexibility in terms of classroom organization [e.g., individualization versus large conventional classrooms], method of presentation [e.g., learner paced versus instructor paced], and method of practice [e.g., learner control of environment and instruction versus instructor control] . . . “(Skinner & Schenck ,1992, p. 373-374).

The results of this study do not rule out the possibility of any other educational method, with similar instructional strategies as those mentioned specifically in the distance education portion of the learning preference segment and reasons for participating in distance education courses, successfully meeting the needs of ADDults. It is not the educational method as such that provide the opportunity of meeting the learning needs of ADDults but rather the instructional strategies that are employed within the method that allow flexibility of when, where and how ADDults study. Any educational method has the capabilities of meeting the needs of the ADDult as long as it incorporates the instructional strategies recommended by Javorsky and Gussin (1994) for ADDults.

### Limitations of the study

The statistical tests used in this study represents a tool for comparing groups. They were not used in the true hypothesis testing sense primarily because the per experimental wise error rate given in the number of tests conducted was high and indeterminable given the number of statistical tests conducted.

The size of the ADDult sample group and the random independent control group were small. Therefore, it is not feasible to generalize the results to a larger population. It is not known if the data obtained from the demographics, learning preferences and reasons for participating in distance education courses sections of the questionnaire on the ADDults was a true representation of all ADDult distance learners. However, the ADDult sample group and the random independent control group did not entirely consist of Athabasca University students. The influence of varying distance education instructional strategies as a result of students taking courses at different education institutions could influence the results and their interpretations.

It was difficult to obtain ADDults as volunteers for this study due to the following reasons:

1. At this time, the numbers of ADDult learners and the proportion of those taking distance education courses are not known.
2. There may be adult learners who have ADD who have not been diagnosed as yet.
3. Adults who have ADD may be reluctant to identify themselves as ADDults due to confidentiality.
4. The symptoms that result in a diagnosis of ADD may hinder the ADDults from participating in the study. An ADDult may be interested in participating in the study but lack the attentiveness to respond or participate.

### Recommendations

As more adults are diagnosed with ADD and as the children now being diagnosed with ADD become adults, the numbers of ADDults will increase. Correspondingly, as the numbers of ADDults increase so will their growing needs as learners within the educational community.

The educational community that facilitates learning for ADDults should endeavor to incorporate instructional strategies within their educational methods that are conducive to the learning needs of ADDults. As the educational community becomes familiar with the learning preferences of ADDults and corresponding recommended instructional strategies, successful learning outcomes may be facilitated for ADDults.

In reviewing this study, the following recommendations for the future research are suggested:

1. Increase the sample sizes of both the ADDult and control groups in the survey. This would enable the study to be analyzed statistically for generalizability.
2. Increase the number of questions in the learning preference section that were specifically related to the instructional strategies of distance education in the survey. This may enhance the understanding of what specific ADDult learning preferences were related to the instructional strategies of distance education.
3. Further development and validation of the questions and questionnaire strategies to measure ADDults' requirements for instructional support and design of instructional systems.
4. Further study into the use of technology and its importance to ADDults should be conducted.

5. Increase the number of methods of distance education delivery in the survey other than correspondence, computer-conferencing and television. This may provide a more in-depth study of the instructional methods of distance education and their corresponding instructional strategies.

6. Further research into the breakdown and classification of instructional strategies and methods that are effective for distance learners in general and ADDults specifically.

7. Direct measurement of learning performance of ADDults under a variety of instructional methods and strategies should be undertaken. The measurement of learning performance and success would be alternative to asking students their opinions.

8. Follow-up focus interviews of individual students should be performed. These interviews may aid in increasing understanding of the differences of ADDults and other distance learners as well as assist in the refinement of answers.

This preliminary research has provided greater understanding into ADDults as learners. It has suggested that the instructional strategies of distance education may be important in facilitating a learning environment that meets the needs of ADDults. It has demonstrated the need for further research of ADDults as learners and distance learners.

Furthermore, this preliminary research has shown that the instructional strategies employed in distance education may afford the ADDult the opportunity to demonstrate their intellectual aptitudes and their potential abilities as dynamic learners.

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# HELP WANTED

I am a graduate student in the Master of Distance Education Program at Athabasca University. I am working on a research study aimed at learning more about Attention Deficit Disorder in the Adult Population and Distance Education.

If you are an adult with ADD (Attention Deficit Disorder) and are taking distance education courses or have recently taken distance education courses, I could use your help as a volunteer in my study.

To volunteer simply send me your name, address, and phone number to:

Willy Fahlman  
Box 43  
Penhold, AB.  
T0M 1R0  
e-mail wfahlman@rttinc.com

or call toll free using the A. U. line 1-800-7889041 extension 6130 to leave your name, address and number with Glenda or Avis (MDE Program) at the Centre for Distance Education.

All information provided to me on this project will be kept in strict confidence. You will be asked to complete a questionnaire and you may be selected for a follow-up interview (all kept in strict confidence).

If you require more information before volunteering please call Glenda or Avis at 1-800-7889041 extension 6130 and request that I contact you.

Participants selected for the project may decide whether they wish to continue with the study at any point.

Thank you for your help  
Willy Fahlman

## Appendix B: Survey Questionnaire

### Questionnaire

**All information provided in this questionnaire will be held in the strictest of confidence. Nowhere in this researcher's documentation will any names or addresses be used that may identify you as a respondent. Under no circumstances will your name or address be forwarded to an interested third party.**

#### Demographics

Name:

Age:

Address(rural/urban):

E-mail address

Gender:

Marital Status:

Full/Part-time Employment:

Full/Part-time student:

Future Educational Plans:

Distance Education Courses taken (Please list starting with most recent):

Name of course	Year	Course Level (e.g. 100, 200, 300)	Instructional Method (e.g. teleconference, computer conferencing, correspondence, video-conferencing, etc.)
----------------	------	--------------------------------------	--

Have you taken any other distance education courses in addition to those mentioned above? (include any home study)

This questionnaire is divided into 2 parts. The first section attempts to distinguish your learning preferences. The second section discusses the motives for your participation in distance education courses.

## LEARNING PREFERENCES

Read the following statements and decide the extent to which you agree or disagree with the statement. For each statement, place an "x" in front of one of the following:

**SD** - if you Strongly Disagree, **D** - if you Disagree,

**U** - if you are Undecided, **A** - if you Agree, or

**SA** - if you Strongly Agree

### Example statement:

I like apples.            x SD     D     U     A     SA

The respondent is indicating that they strongly disagree with the statement.

Please answer **ALL** of the following statements with only **ONE** answer per statement.

- |  |    |   |   |   |    |
|--|----|---|---|---|----|
| 1. I need to take frequent breaks when I am studying.        | SD | D | U | A | SA |
| 2. I need frequent reminders to complete tasks.              | SD | D | U | A | SA |
| 3. I learn better with other people.                         | SD | D | U | A | SA |
| 4. Noise impairs my concentration.                           | SD | D | U | A | SA |
| 5. I have difficulty completing tasks.                       | SD | D | U | A | SA |
| 6. I like to have an outline of the task I need to complete. | SD | D | U | A | SA |
| 7. I like to eat or drink while learning.                    | SD | D | U | A | SA |
| 8. I prefer learning from:                                   |    |   |   |   |    |
| a. reading   | SD | D | U | A | SA |
| b. listening   | SD | D | U | A | SA |

c. watching		SD	D	U	A	SA
d. experience.	SD	D	U	A	SA	
9. I have difficulties meeting instructor deadlines for completing assignments.		SD	D	U	A	SA
10. I enjoy taking notes from lectures.		SD	D	U	A	SA
11. I prefer instructors to stay away until I have completed my work.		SD	D	U	A	SA
12. I study better with background noise.		SD	D	U	A	SA
13. My ability to learn is affected by the lighting of the room.		SD	D	U	A	SA
14. I prefer to work alone.		SD	D	U	A	SA
15. The temperature of the room affects my ability to study.		SD	D	U	A	SA
16. I prefer to study lying down or in another position other than sitting up.		SD	D	U	A	SA
17. I feel motivated to learn.		SD	D	U	A	SA
18. I often change positions when I study.		SD	D	U	A	SA
19. I can block out background noises when I study.		SD	D	U	A	SA
20. The best time for me to learn is:						
a. in the morning		SD	D	U	A	SA
b. in the afternoon		SD	D	U	A	SA
c. in the evening		SD	D	U	A	SA
d. at night.		SD	D	U	A	SA
21. I have difficulty sitting and concentrating on:						
a. Television		SD	D	U	A	SA
b. Lectures		SD	D	U	A	SA



- |  |    |   |   |   |    |
|--|----|---|---|---|----|
| c. Computer Games  | SD | D | U | A | SA |
| d. Music.  | SD | D | U | A | SA |
| 22. I find it difficult to learn when I feel<br>pressured. | SD | D | U | A | SA |
| 23. I am easily distracted in a regular classroom.         | SD | D | U | A | SA |

## REASONS FOR PARTICIPATING IN DISTANCE EDUCATION COURSES

Read the following statements and decide the extent to which you agree or disagree with the statement. For each statement, place an "x" in front of one of the following:

**SD** - if you Strongly Disagree, **D** - if you Disagree,

**U** - if you are Undecided, **A** - if you Agree, or **SA** - if you Strongly Agree

### Example statement:

I like apples.                    x SD      D      U      A      SA

The respondent is indicating that they strongly disagree with the statement.

**Based on the distance education courses that you have taken, please answer ALL of the following statements with only ONE answer per statement.**

- |   |    |   |   |   |    |
|---|----|---|---|---|----|
| 1. I need more time for learning than is permitted in<br>conventional education courses.                        | SD | D | U | A | SA |
| 2. I prefer having course materials available prior to<br>course commencement.                                  | SD | D | U | A | SA |
| 3. I prefer having a text book with an accompanying<br>study guide.   | SD | D | U | A | SA |
| 4. I prefer study guides that emphasize objectives,<br>key concepts, and provide an overview<br>of the content. | SD | D | U | A | SA |
| 5. I prefer having access to exam review questions  | SD | D | U | A | SA |

as offered in study guides.

- |  |    |    |   |   |    |    |
|--|----|----|---|---|----|----|
| 6. I prefer a study environment for learning that reduces auditory and visual distractions.                                  | SD | D  | U | A | SA |    |
| 7. The flexibility of distance education courses played a role in choosing to take these courses.                            | SD | D  | U | A | SA |    |
| 8. My preference of study location played a role in choosing to take these courses.  | SD | D  | U | A | SA |    |
| 9. The following design features of distance education played a role in choosing to take these courses:                      |    |    |   |   |    |    |
| a. individualization of instruction  | SD | D  | U | A | SA |    |
| b. variations in the amount of instruction   | SD | D  | U | A | SA |    |
| c. variations in the time to complete courses  | SD | D  | U | A | SA |    |
| d. variations in the amount of feedback  |    | SD | D | U | A  | SA |
| e. variations in the amount of interaction   | SD | D  | U | A | SA |    |
| f. variations in the requirements for interaction  | SD | D  | U | A | SA |    |
| 10. The availability of technology in distance education courses played a role in choosing to take these courses.            | SD | D  | U | A | SA |    |
| 11. The instructional methods used in distance education played a role in choosing to take these courses.                    | SD | D  | U | A | SA |    |
| 12. The instructional methods used in distance education assisted me to master the course objectives.                        | SD | D  | U | A | SA |    |
| 13. For these courses, I preferred the instructional methods of distance education compared to conventional lecture methods. | SD | D  | U | A | SA |    |

14. Answer this question only if you have Attention

Deficit Disorder (ADD):

Having ADD played a role in choosing SD D U A SA  
to take distance education courses.

15. Please list your primary reasons for enrolling in Distance Education courses/programs :

16. Please indicate if you are willing to participate in a follow-up interview Yes No

**Thank you for completing this questionnaire.**

## Appendix C: E-mail

### E-Mail Specifying Computer Program

Thank you for volunteering to be a part of my research study on ADDults and distance education. I have finally obtained enough volunteers to begin my study.

I am planning on sending out my questionnaire via e-mail as an attached file (MS Word 6.0). Will you be able to answer the questionnaire and send it back to me as an attached file (MS Word 6.0) via e-mail?

I look forward to hearing from you

Willy

## Appendix D: Reminder E-mail

### Example of a Reminder E-mail Message

I sent out my questionnaire on Jan. 23. Could you please let me know if you received it?

Thank you

Willy