

**Distance Learning in the Canadian Air Force:
Knowledge, Experiences and Perceptions**

Denis Forest

A Thesis

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in Partial Fulfilment of the Requirements

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BY

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Abstract

The purpose of this study was to provide a prospective view of Canadian Air Force (CAF) personnel knowledge, experiences, and perceptions of Distance and/or Distributed Learning (DL). A Web-based survey, comprised of 56 items, was administered through a corporate Intranet to eleven randomly selected Operational Squadrons in December 2000. 605 Officers and Non Commission members responded to the survey. The median CAF learner possesses a "basic" knowledge of the major concepts pertaining to DL. The median CAF learner has however a "rudimentary" knowledge (lower than basic) of specific leading technologies currently in use in the field of DL. With regard to their experiences, it is primarily centered around one-way paper based instruction (54%), with distributed CBT (16%) and WBT (13%) distant second and third. CAF personnel participate mostly in DL for educational upgrade and professional development purposes (76%). CF qualifications obtained through DL accounted for only a quarter of the reported cases. Learners are accessing the programs from their home (69%), office (15%) and learning centre (8%). One of the major findings was that CAF personnel believe DL can be as effective as face-to-face instruction for non-core instructional functions. When it comes to core instructional functions they believed face-to-face instruction to be more effective. Respondents value the unique benefits of DL such as geographical, temporal independence and the variety of media/resources used in the provision of DL. They perceive the lack of peer and instructor immediacy and support as the most significant disadvantage of DL. Finally, respondents were willing to participate in DL for educational upgrade (87%), professional development (80%) and advanced MOC training purposes (76%).

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The submission of this thesis is the culmination of a long journey in which I have experienced the challenges and rewards of graduate education. I complete my program with a feeling of exhilaration brought upon by the acquisition of new knowledge and the realization that there is so much more to learn.

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Chapter I

Introduction

1.1 Background to the Problem

In a context of accrued participation in peacekeeping/peacemaking missions, humanitarian relief and assistance to civil powers, Canadian Air Force (CAF) personnel are spending an increased amount of time away from their families. With a growing education and professional development requirement, limited resources, and more varied and complex post-modern sociological and technological environment, CAF commanders are under pressure to provide more training and education. This training and education needs to be delivered with limited resources and minimal disruption to the member's quality of life.

The CAF has a long tradition of outstanding training conducted in an instructor-led face-to-face environment. This approach has been used successfully to indoctrinate and train a highly professional air force for several decades. Amongst these courses, the CAF awards a significant number of qualifications that focus primarily on the acquisition of knowledge and the development of cognitive skills. All the training and professional development conducted at the Canadian Forces School of Aerospace Studies and several other qualifications awarded by other CAF institutions fall into this category. Distance or Distributed Learning (DL) may, as one of the components of an overall training system, solve some of these education and training requirements. DL can deliver the learning activities required to resolve identified performance deficiencies anywhere, anytime, through modularized, standardized instruction, to the right people, at a competitive cost.

Other militaries, large civilian corporations and academic institutions have embraced the potential of DL. Point in case, the US Air Education and Training Command offers more than 600 formal courses with more than 200,000 enrolments annually (Miller, 2001, p.31). A recent Forbes article depicted the DL financial stakes in the following terms:

...they estimate a \$10 billion virtual higher-ed market by 2003 and an \$11 billion corporate-learning market by the same year ...John Chambers, the highly esteemed CEO of Cisco Systems, calls on-line education the "killer app" of the Internet... Meanwhile, at least in higher education, the Establishment is moving quickly to embrace the Internet... In 1997-98, almost 44% of all higher education institutions offered distance courses. Larger institutions are moving fastest: 87% of those with more than 10,000 students offered distance classes, while only 19% of institutions with fewer than 3,000 students did so. (Svetvcov, 2000, P.50).

There is, at this time, renewed interest for DL in the CAF. The Chief of Air Staff (CAS), based on discussions held by the Technology in Training Advisory Group (TTAG), is pursuing a strategy to implement the Air Force Network for Education and Training (AFNET). The DL infrastructure will be established via the Defence Wide Area Network, and will create a virtual campus linking CAF training establishments with each of the thirteen CAF Wings located from coast to coast. The learner will have access to learning resources and support at a local learning center established on each Wing. From a courseware point of view, there are a few projects at the analysis and design stage: They should be ready to be delivered at a distance once the AFNET is in place.

Despite this renewed interest, the CAF has been very slow, however, in leveraging the possibilities of this technology. In a recent informal survey conducted by the Chief of the Air Staff - Director General of Personnel Generation and Training (CAS PG &T), it was determined that out of the several hundred qualifications awarded

annually in the CAF, only two were offered using a DL methodology as the primary vehicle. Furthermore, it was established that most training establishment commandants and training managers were not apprised of the opportunities that DL can offer. It is therefore clear that a substantial education endeavour must be undertaken if the training community is to look at DL as a viable option in the conduct of training and education of its personnel. Specifically, AFNET managers need to know how learners will react should more and more of the knowledge and cognitive skills required for their job be offered in a distributed manner. At the time of this study there was no available data on the knowledge level, experiences and perceptions of CAF learners towards DL. This study was designed to address this deficiency.

1.2 Research Questions

The purpose of this study was to produce a snapshot of CAF personnel knowledge, experiences and perceptions with regard to DL. Specifically, the study explored the following research questions:

- (1) What perceptions do CAF personnel have about their knowledge of DL concepts and technologies?
- (2) What type of experiences do CAF personnel have regarding DL?
- (3) What are the perceptions of CAF personnel regarding the effectiveness of DL when compared to face-to-face instruction?
- (4) What are the perceived benefits of DL from CAF personnel point of view?

- (5) What are the perceived disadvantages of DL from CAF personnel point of view?
- (6) Would CAF personnel willingly participate in DL programs for educational upgrade, professional development and advanced Military Occupation (MOC) Training?

1.3 Significance of the study

One of the key factors in the successful implementation of DL in the CAF is undoubtedly the reaction of learners to this new way of doing things. Proper change management and leadership needs to be based on a solid understanding of the learners needs. It was believed that this study would provide guidance on issues such as:

- (1) What perceptions do CAF learners have of the DL concept?
- (2) Are learners prepared to learn at a distance?
- (3) If not, what are the main obstacles from their perspective?
- (4) How can the CAF eliminate these obstacles?
- (5) Given what we know about the target population, what instructional design, communication, marketing and change leadership strategies should be employed to implement DL in the CAF?

1.4 Delimitations

Delimitations are those restrictions that are researcher-selected in order to keep the study to a reasonable size and scope. The study was delimited as follows:

- (1) The survey was designed to produce a prospective look at the potential user of a DL system. It was undertaken with the intent of getting some insight (snapshot) into the initial reactions of potential learners.

Therefore, the study did not attempt to mirror an experimental design format based on "pre-test/post-test with control group";

- (2) The study was delimited to one group of DL stakeholders: potential distance learners;
- (3) The study was delimited to CAF members only. Other environments (the Navy and the Army) are composed of a different set of occupational, cultural and organizational characteristics that would have made the overall population too heterogeneous.

1.5 Limitations

Limitations are those aspects of the study over which the researcher has no control. The limitations for this study were:

- (1) Respondents were informed of the organizational benefits of this study and reminded of the importance of their participation. A 100 percent return rate cannot however be guaranteed. Non-responses were assumed to be random;
- (2) Access via e-mail through the corporate Intranet to randomly sample subjects was not possible at the time the study was conducted. A cluster sampling methodology was used to obtain a representative number of subjects.
- (3) The ongoing integration of new technologies at home and in the workplace rapidly alters perceptions. The data collected was a valid snapshot at the time of the study, but it behooves the organization to use the data in a timely fashion before it becomes dated.

1.6 Outline of the Methodology

This descriptive research was conducted using a web-based survey which was administered to a representative amount of CAF units (clusters) over the Defence Information Network (DIN), a corporate Intranet.

The survey was comprised of seven parts divided as follows:

- (1) Biographical data;
- (2) Knowledge of DL;
- (3) Experiences with DL
- (4) Perceptions of comparative effectiveness of DL Vs to face-to-face instruction;
- (5) Perceived benefits of DL;
- (6) Perceived disadvantages of DL; and
- (7) Willingness to participate in DL.

Frequency tables, charts and descriptive statistics were used to paint a portrait of the CAF distance learner population.

Chapter II

Review of the Literature

2.1 Introduction

As the CAF goes about its business of delivering the right skill set to the right people at the right time, it constantly examines alternative approaches to training and education. In that process, it must become familiar with the benefits of new technologies and approaches and gain insight into their inherent limitations. It then forces us to take an inward look at our organization and to ascertain the applicability of the proposed approach. Should the new paradigm be viewed as a viable alternative, decision makers must carefully consider the organizational impact and challenges of implementing these new methods and technologies. DL offers great potential for the CAF, we must, however, proceed with caution and examine this potential solution from a critical stand point.

The literature review will therefore concentrate on current developments in the field of DL within the WWW context, the perceived effectiveness of this methodology, its relevance for adult learner and the constructivist approach. We will then explore the concept of virtual communities and network learning environments and discuss the role of the DL instructor. Trends will be suggested as a conclusion to this chapter.

2.2 DL and the WWW

There are several different definitions of the concept of DL. Most publications dealing with one DL facet or another typically attempt to provide a unified description or provide a list of characteristics that an instructional or learning activity must possess to be considered as such. One of the most comprehensive attempts is the definition of the

California Distance Learning Project (1997) which characterized distance learning along the following key elements:

- (1) The separation of teacher and learner during at least a majority of each instructional process;
- (2) The use of instructional media to unite teacher and learner and carry course content;
- (3) The provision of two-way communication between teacher, tutor or educational agency and the learner;
- (4) Separation of the teacher and learner in space and time; and
- (5) Volitional control of learning by students rather by the distance instructor.

An important element of the definition is the concept of temporal and geographical independence. The ability to undertake the training and education program anywhere, anytime and, therefore, offer maximum flexibility to the learner. Related to this issue is the debate about the advantages and disadvantages of synchronous and asynchronous communication. Nipper (1989), an early writer in the area of CMC, is suggesting that it is somehow important to create the sense that the group is working together in real time, indicating that it allows participants to feel when they enter a discussion forum in a course site, that they have entered a lively active conversation. On the other hand, some of the literature questions the educational value of Chat:

...We find that it rarely allows for productive discussion or participation and frequently disintegrates into simple one line contribution of minimal depth...We do not mean to completely condemn synchronous...especially

useful in facilitating brainstorming and white boarding sessions (Palloff & Pratt, 1999, p. 47-48.)

Other forms of synchronous DL such as desktop computer conferencing do offer the opportunity to conduct a virtual class by sharing applications, audio, video, data and voice in real time. In order to be successful, the number of students participating should be small. The concerns and time zone of all participants must be considered, and guidelines for equal participation must be established in advance. (Palloff & Pratt, 1999, p. 48.) As a general guideline, synchronous groups should be small and asynchronous groups can be larger. The time and effort an instructor expends becomes a linear function of the number of students in a class. Administrators can no longer economize on educational efforts by increasing class sizes. (Harasim, Hiltz, Teles, Turoff, 1996, p. 232)

One environment that provides an infrastructure favourable to the incorporation of all desired DL characteristics in both synchronous and asynchronous mode is the WWW. The explosion of Web-based training and education, as described in Chapter 1 of this thesis, is testimony to the ease of use and the versatility of WBT. Some imperatives of Web-Based Training (WBT) are:

- (1) Increased participation;
- (2) Increased variety;
- (3) Need for increased flexibility;
- (4) Increased expectations;
- (5) Changing nature of knowledge; and
- (6) Increased competition. (McCormick, Jones, 1998 pp. 17-19).

The benefits of WBT are numerous, and they keep growing as this network of networks keeps expanding in size and capacity. Computer mediation, geographic independence, temporal independence, platform independence, simple familiar user interface, increased communication and increased learner control are the main advantages of this relatively new environment (McCormick, Jones, 1998 pp.19-22).

The uninitiated may have some pre-conceived ideas about WBT. The range extends to the full spectrum of possible “myths” and can be summarized as follows:

- (1) It will save money;
- (2) It will cost too much;
- (3) I can't see them;
- (4) Its not interactive;
- (5) Education is more important than technology;
- (6) Technology is more important than education;
- (7) It will be like the movies;
- (8) There is only one way to do it;
- (9) It will benefit only remote students;
- (10) It is inhuman (McCormick, Jones, 1998 pp. 24-27).

Some of the problems associated with WBT are access and resources, cost, training for faculty and students alike, adapting to change including new methods, infrastructure, support and administration, lack of quality standards and copyright, privacy, security and authentication. (McCormick, Jones, 1998 pp.22-24). Furthermore, some students report information overload, communication anxiety in relation to the delayed response in an asynchronous environment, increased work and responsibility,

difficulty in navigating on-line and following the discussion tread, loss of visual cue and concerns about health issues related to computer use. (Harasim, 1989, p. 15)

Educational providers will, at one point or another, be confronted with a fundamental question: Should I make my course available at a distance? Some of the considerations to take into account when contemplating DL are:

- (1) Institutional factors including: mission statement and direction, infrastructure and funding, promotions and rewards, workload and changing teaching methods;
- (2) The subject including: the type, existing resources for that subject, the appropriate pedagogy, and experiences in that field;
- (3) The teachers including: experience, ability, number, commitment, skills, preferred teaching styles and perceived/real benefits;
- (4) The students including: age, culture, language, educational experience, motives, preferred learning styles, communication skills, perceived/real benefits;
- (5) The technology including client's software and hardware, the server, distribution method, technical support. (McCormick, Jones, 1998, pp.31-50)

An important consideration in DL and WBT is the imperative for “learner preparation”. It may help reduce or even prevent some of the above described problems. The terms refer to the preparation of the student for a distance education experience beyond the technical orientation. (Hardy, Boaz 1997, p.41) . The literature suggests the following minimum amount of information to be distributed to distance learners:

- (1) Policies for students learning at a distance;
- (2) Description of technology utilized;
- (3) Administrative information such as registration textbooks, etc.;
- (4) Personal contact list for main campus and remote sites;
- (5) List of support services;
- (6) Extended course syllabus;
- (7) Grading policies; and
- (8) Suggested characteristics for distance learners: assertive, independent, self-discipline and motivated (Hardy, Boaz 1997, p.47).

The success of WBT is often dependent on the level of interactivity provided within the courseware environment. Referring to Moore (1989), Wagner describes three types of interaction agents: between learner and instructor, between learners, and between learner and the content they are trying to master (Wagner 1997, pp. 20-21).

Focusing interactions on outcomes rather than agents, provides a context to change the learners and move them toward the attainment of an educational goal. The intent of the interaction then shifts to the following purposes:

- (1) To increase participation;
- (2) To develop communication;
- (3) To receive feedback;
- (4) To enhance elaboration and retention;
- (5) To increase motivation;
- (6) For negotiation of understanding;
- (7) For team building;

- (8) For discovery;
- (9) For exploration; and
- (10) For closure. (Wagner 1997, pp. 20-21)

Active student participation in the communication process is another key dimension to WBT. The amount and nature of the participation will have a direct impact on student interest, motivation comprehension and may serve as an ongoing method of confirmation. A summary of the participation strategies in a WBT environment is provided below:

- (1) Establish clear participation guidelines that the participants discussed and agreed to;
- (2) Be clear about how participation will be evaluated and how it figures into grading schemes for the class;
- (3) Create a clear syllabus and course structure that is easy to follow but allows for flexibility;
- (4) Be clear about how much time is involved in participation in an on-line course so there is no misunderstanding about what it means to work in this medium;
- (5) Create a course site that is welcoming, easy to navigate and into which there is little difficulty posting messages;
- (6) Be a good role model of on-line participation by being visible on a daily basis as the course progresses;
- (7) Be willing to step in and set limits if participation is waning or is heading in the wrong direction;

- (8) Be willing to make phone calls to persons who are not participating to ask why and draw them back in;
- (9) Most important strive to create community through inclusion of the human element involved in the course. (Palloff & Pratt, 1999, p.107-108).

2.3 Perceptions of DL; No Significant Difference

The debate about the effectiveness and efficiency of a particular medium over another one is still a favourite past time in some circles. Extravagant claims about the superiority of a new method are not new, and may seem appealing to management who see DL as a panacea that will satisfy all education and training needs of their organization. Conversely, the uninitiated learner or instructor may unequivocally reject DL as a "second class" instructional strategy that does not measure up to face-to-face instruction. The literature, however, suggests a different conclusion. The following quote is reflective of a more neutral tendency:

"...There are no learning benefits to be gained from employing any specific medium to deliver instruction...The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievements any more than the truck that delivers our groceries causes changes in our nutrition." (Clark, 1983)

Learners seem to assess a learning situation in terms of the characteristics of the task and the characteristics of the medium. They make a decision as to the ease or difficulty of the lesson based on their past experience with similar events. They then decide to exert a certain amount of effort in processing the lesson" (Cennamo,1994 p.34). Other studies showed that instructors were willing to teach a distance learning class

again, but they rated the quality of the courses as equal or lower quality than other classes taught on campus. Their students, on the other hand, were highly satisfied with these instructors and the courses. But the critical factor in much of traditional classroom instruction, direct interaction with instructors, played no role in determining students' satisfaction in these courses (Smith, Reiner, Jan 2000). In "Teaching accounting via Pictoretel", a study measuring the effect of distance education on the learning experience, only 2 of the 73 respondents (2.7%) indicated that they had previously taken a different course via DE. However, 57.5% (n=42) indicated that they would take another distance education course in the future. Thirty-six percent of the total sample indicated they would not take another DE course in the future, and 6.8% did not respond. (Harnar, Brown, Mayall, 2000)

One concern expressed about the distance learning setting is the effect on student behaviour. Students taking a DL class were asked to indicate how the setting influenced things like their attendance in class, asking and answering questions, and motivation to learn. For most actions the most common response was that the setting made "no difference". Students appear to adjust to the setting and, for the most part, only a slight effect on their academic behaviours is indicated. (Bozik Sep 96). In an other study, the initial reservations of staff about the quality of distance students' learning have largely been overcome as experience in the use of audio conferencing has increased. Moreover, the results of a specially conducted survey of the University of Aberdeen's distance students suggest that, while they recognise that the experience is different from that of conventional students, there are no signs that they think it is inferior in quality. (Newlands, McLean, Oct 1996, p.1). There seems to be a positive carryover from

experience with previous distance education courses. It was found that the Study Skills score was significantly higher for the participants who had taken previous distance education courses. Additionally, those students who previously took distance education courses were more likely to contact the professor outside of class through e-mail, telephone, or appointment. (King, Harner, Brown, 2000, p.147). Finally, the use of interactive distance learning did have a significant impact on student evaluations of the course. Most of the differences dealt with the instructor's teaching methodology and style and his or her interaction with students. Because most of the differences were found with undergraduate courses rather than with graduate courses, it appears that the distance learning technology is better suited for graduate programs than for undergraduate programs. (Clow, Aug 99).

2.4 DL, Adult Learning and Constructivism

Although a limited number of high schools have started to employ DL as the instructional delivery strategy, the phenomenon has so far been mostly limited to an adult population. This phenomenon is not a coincidence. It is indeed interesting to note the similarity between widely published assumptions about adult learners and various lists of common characteristics of distance learners such as the California Distance Learning Project (1997). It states that DL students typically:

- (1) Are voluntarily seeking further education;
- (2) Are motivated, have higher expectations, are more self-disciplined;
- (3) Tend to be older than other students; and
- (4) Tend to possess a more serious attitude towards their courses.

Hardy & Boaz (1997), for their part, provide the following suggested characteristics for distance learners: assertive, independent, self-disciplined and motivated). The similarities are striking when one looks at the Lindeman's key assumptions about adult learners:

- (1) Adult are motivated to learn as they experience needs and interests that learning will satisfy;
- (2) Adults orientation to learning is life centred;
- (3) Experience is the richest source for adult learning; and
- (4) Adults have a deep need to be self-directing (Knowles, Holton III, Swanson, 1998, p.40).

DL methodologies which fully exploit the potential, amongst other things, of the multiple perspectives offered by the World Wide Web (WWW) and the interactivity of Computer Mediated Communication (CMC) are especially suited for adult learning and constructivist approaches to instruction and learning. The challenge for Web-based DL designers is, therefore, to produce opportunities where the learner will be invited to go beyond a simple acquisition of facts. The emphasis must instead be placed on interpretation and reflection. Learning from that perspective can, therefore, be redefined in terms of:

...learning in which adults come to reflect on their self image, change their self conception, question their previously internalised norms and reinterpret their current and past behaviours from a new perspective (Brookfield, 1986).

In keeping with the constructivist approach, the Web-based learning environment needs to foster productive thinking by encouraging:

- (1) Problem discovery and formulation;
- (2) Organizing and processing problem information;
- (3) Idea generation; and
- (4) Evaluation of ideas. (Crutchfield, 1972, pp 192-195)

The constructivist point of view is further articulated in the literature as an ideal vehicle for adult learning, and, again the desired characteristics seems to be reproducible in a WBL environment. Some of the overriding impact on the quality of the educational experience, such as the provision of sustained discourse between teacher and student, is discussed. Students can best create and validate understanding in an interactive environment where concepts are offered, challenged, and acted upon. Excessive concern with reaching prescribed goals and managing the setting to shape required behaviour can lead to superficial learning outcomes (Garrison, 1993, p.11-16). This approach refers us to the fact that a rift has opened between how education is viewed and delivered in the classroom and how we are beginning to obtain knowledge in our society. (Strommen & Lincoln 1992).

In the previous paragraphs we have discussed the convergence of adult learning, constructivism, Web Based DL and CMC. Based on cognitive learning theories (Garrison, 1993, p.204-208) the author offers some implications for distance education which include:

- (1) Learning necessitates consideration of alternative perspectives, discussing discrepancies with regard to previous understanding, and negotiating meaning with the teacher and fellow students;
- (2) Teaching is not the transmission of prescribed information: It is a process of facilitating the exploration and creation of meaning through collaboration. The teacher can enhance motivation, facilitate learning, and encourage critical analysis;
- (3) Acquisition of knowledge is never complete and, therefore, we must see our understanding as tentative and subject to constant validation and revision;
- (4) Pre-packaged learning materials are generally prescriptive in nature and afford little flexibility over what is to be learned and how;
- (5) Independent thought is "best achieved through sustained two-way communication where scepticism and the challenging of assumptions are modelled and encouraged;
- (6) If the goal of distance education is to facilitate learners in their construction of meaning, then methods, materials and evaluation must be congruent with that goal; and
- (7) Planning the course and assessment questions must be carefully conducted to avoid presenting a learning context which is perceived by students to acquire, or reward, surface approaches.

It is worthy of note that learning also takes an added dimension sometimes referred to as "*Double-Loop Learning*". When students are engaging in a learning

process through the use of technology such as Web-Based Learning (WBL), they are learning not only course material but something new about the learning process and about themselves...how learning occurs electronically (Palloff & Pratt, 1999, p.130). Furthermore, "Transformative Learning refers to learning that is based on reflection and on the interpretation of the experiences, ideas and assumptions gained through prior learning. This type of learning is rooted in the meaning-making process that is central to constructivism, which we have already established as a major feature of the on-line classroom. (Merizow, 1990, p. 17)

If transformative learning is to take place in a DL environment, the following guiding principles should be considered:

- (1) A rich variety of media are needed;
- (2) There is concern about the learning prospects for students in DL programs with minimal participant interactivity;
- (3) Teachers can often not interact with small groups to the exclusion of others, and this prohibits transformative communication;
- (4) Today's DL technology fails to create many of the important aspects of transformative communication for learning;
- (5) Media technologies need to match highly interactive conversational needs;
- (6) Specific activities that take advantage of the offerings of the technology are likely to pay off; and
- (7) Distributed multimedia learning environments may enrich the capabilities of participants to communicate (Pea, 1994, pp. 285-299).

Finally, the DL phenomenon is viewed by many as a post-modern experience. Four ways in which DL corresponds with post-industrial tendencies include the dislocation from the classroom, self-direction, social interactions among students, and an affinity towards electronic media . Autonomous groups will become the main constituent of the learning process". Methodologies that allow for originality, flexibility, and openness will be preferred. (Peters, 1993)

2.5 Virtual Communities and Network Learning Environments

Let us now turn our attention to the challenge of creating DL conditions where students will be encouraged to learn according to the constructivist paradigm. This setting is sometimes referred to as Virtual Communities and/or Network Learning Environments. Campuses are working to develop learning communities because of the power they hold in facilitating a culture of life long learning. (Fleming, 1997)

The challenge is to implement the right combination of synchronous and asynchronous technologies to create a rich mosaic of network learning environments consistent with the mission of the educational provider, learner expectations and the delivery style of the instructor. (Chute, Sayers, Gardner 1997, p.76). The instructor in this environment becomes an orchestrator of multimedia technologies. Two key dimensions of an effective program are interaction and visual design. (Chute, Sayers, Gardner 1997, p.77). The basic steps that must be taken in order to build a virtual community are:

- (1) Clearly define the purpose of the group;
- (2) Create a distinctive gathering place for the group;
- (3) Promote effective leadership from within;

- (4) Define norms and a clear code of conduct;
- (5) Allow for a range of member roles;
- (6) Allow for and facilitate sub-groups; and
- (7) Allow members to resolve their own disputes. (Palloff & Pratt, 1999 p.24).

People who are introverts are more adept at creating virtual environments because they can process information internally and are less outgoing socially. It is more comfortable for an introvert to spend time thinking about information before responding to it. It is more difficult-but not impossible-for extroverts to interact this way. Perhaps they have less need to and are at first, not willing to engage in the process (Palloff & Pratt, 1999, p. 22).

The keys to the creation of a learning community and successful facilitation on-line are simple. They are honesty, responsiveness, relevance, respect and empowerment (Palloff & Pratt, 1999, p.20). The principles involved in the delivery of distance education are basically those attributed to the more active constructivism form of learning - with one difference: in distance education attention needs to be paid to the developing sense of community within the group of participants in order for the learning process to be successful. Some of the desired outcomes indicating a successful virtual learning community are as follows:

- (1) Active interaction involving both course content and personal communication;
- (2) Collaborative learning evidence by comments directed primarily student to student rather than student to instructor;

- (3) Socially constructed meaning evidenced by agreement or questioning, with the intent to achieve agreement on issues of meaning;
- (4) Sharing of resources amongst students; and
- (5) Expression of support and encouragement exchanged between students as well as willingness to critically evaluate the work of others. (Palloff & Pratt, 1999 p.22).

2.6 The DL Instructor

The various tasks and roles demanded of the on-line instructors are defined in four general areas: pedagogical, social, managerial and technical (Collins and Berge, 1996). In a study surveying 103 distance educators, the following recommendations were provided by experienced DL instructors:

- (1) Teachers need to adapt teaching patterns to technology, maintain interaction, engage learners, and collaborate with others in course development.
- (2) Instructors wanted more training on how to foster interaction with the students, design visual aids, deal with technicians and site co-ordinators, and how to use the technology more efficiently.
- (3) Effective distance instruction requires thoughtful course adaptation.
- (4) Important factors include praising students, calling them by name, smiling, and providing individual feedback.
- (5) Communication between students at different sites, the instructor, and the support staff was essential.
- (6) Teach the students how to interact over the technology.

- (7) Plan discussions and other activities to promote interaction among students.
- (8) Promote teamwork rather than competition, among students at various sites; and
- (9) The instructor needs to operate from a systems perspective & hypothesis, seeing the big picture of how the presentation, technology, distant sites, and learning process all come together.

Referring to four studies between 1988 and 1994, core instructor competencies were summarised as follows:

- (1) Course planning and organisation;
- (2) Verbal and non-verbal presentation skills;
- (3) Collaborative team work;
- (4) Questioning strategies;
- (5) Subject matter expertise;
- (6) Involving students and co-ordinating at field sites;
- (7) Basic learning theory;
- (8) Knowledge of the distance learning field; and
- (9) Graphic design and visual thinking. (Cyrs 1997, pp. 16-17)

In distance learning, instructors need to achieve clarity through proper organization and planning. The creation of comprehensive, detailed, precise syllabus and interactive study guides is one way to achieve this goal. This is sometimes referred to as the "extended syllabi". (Egan, Gibbs 1997, p. 34-35).

The area of program evaluation, is often the unique responsibility of the course instructor. According to the AEIOU approach, the following areas of distance education programs should be investigated: accountability, effectiveness, impact, organizational context and unanticipated consequences. (Simonson, 1997 pp. 91-92). According to Woodley and Kirkwood (1986) six categories of evaluation information can be collected about distance education activities. They are measures of activity, efficiency, outcomes, program aids, policy and organization.

Finally, the vision that DL and specifically WBT will in the long run be a more efficient delivery method for the instructor maybe never be realized. Instructors in the on-line arena will find that the time and effort required to deliver this type of class is two to three times greater than that required to deliver face-to-face instruction. (Palloff & Pratt, 1999, p. 49.) This is due in part to the requirement to produce the multimedia courseware, without for the most part, the proper support (Crone, 2001), and the necessity to provide individual feedback to student on an ongoing basis through e-mail and/or newsgroups.

2.7 Trends

What does the future of DL as to offer? Most essays seem to link the future of DL with the WWW. On a larger scale, it is also possible to draw a parallel between education and society at large, and to affirm that DL will most likely be shaped by larger industrial and societal trends.

“just as the American economy has moved away from the industrial model to one that is information based, technology intensive, niche oriented and decentralised, so will education have to change”. (Connick 1997, p.7).

For this to occur, policy changes will be required in the following four areas:

- (1) Access will become universal for both faculty and students;
- (2) Quality will shift from measuring inputs to measuring educational outcomes;
- (3) Efficiency with consolidation of many non academic functions to on-line delivery; and
- (4) Productivity, doing more with less given the global competition. (Connick 1997, pp.11-12)

Furthermore, DL will expand and become a major alternative to face-to-face instruction. Rather than remaining on the fringe, the wedding of distance education, information technology and telecommunication into a powerful new educational structure has served as a catalysis for an educational paradigm shift that is well underway. (Connick 1997, p.10).

We can also anticipate that in the not so distant future, intelligent electronic agents that understand learner interest and requirements, will assist learners in locating and navigating virtual libraries. They will be able to store learning experiences in virtual space for learners and for others to re-experience and interact with again and again. Tools needed include information-indexing agents, search engines, expert system, scenario builders, massive multimedia storage and broadband multimedia networks (Chute, Sayers, Gardner 1997, p.82).

2.8 Conclusion

The phenomenon of DL is intimately related to the expansion of the WWW and is, therefore, closely related in terms of benefits and disadvantages. DL does not appear

to have a significant impact on students' perceptions of the quality of the educational experience. DL is a methodology compatible with well publish characteristics of adult learners and is well suited to a constructivist approach to teaching and learning. The creation of virtual communities and network learning environments are critical to the success of WBT and the instructor plays a specific and vital role in orchestrating conditions effective DL. Finally DL is emerging as a main stream instructional and learning methodology. Its importance will continue to grow as we witness the convergence of telecommunication and information technology via the WWW.

Chapter III

Methodology for Collection and Treatment of Data

This chapter provides a detailed description of the procedures used in the study. The first part provides a comprehensive analysis of the questionnaire. The second part explains the composition of the population and the sampling methodology. The third part describes the methodology used to collect the data. The fourth and last part provides the details regarding the treatment of the data.

3.1 Questionnaire

3.1.1 Purpose of the study

The intent of the study was to provide various training and education stakeholders within the Canadian military with a prospective view of specific characteristics of potential distance learners in the CAF. Specifically, the study would determine the overall perceived DL knowledge, experience, and perceptions of DL effectiveness, perceived benefits, disadvantages and willingness to participate in DL of personnel who were actively serving in the CAF in Dec 2000. At a time when the Canadian military was contemplating the migration of a significant amount of traditional courseware to DL, a snapshot of the characteristics of the overall population was seen as a substantial asset for the design, implementation and change management.

A review of the literature yielded only one thesis or dissertation of similar intent. Most studies reviewed were concerned with the effect of a treatment on a specific population (Crawford 1999, Johnson 1998, Isman 1997, Hilgenberg 1997, Townley 1997 and Gillispie 1996). These studies were typically designed in the form of pre-test/post-test or post-test only with control group. In those studies, the perceptions and/or attitudes

of a group of students on DL would be measured before and after an intervention. The study would determine if the treatment had a significant effect on the perceptions and attitudes of the experimental group when compared to a control group who had received a different or no treatment. The single study of similar nature was designed to measure deterrents to participation in web-based continuing professional education (Perdue, 1999), but was considered too restricted in scope to be reproduced within the CAF context.

3.1.2 Pre-testing of the questionnaire and covering letter.

A questionnaire should be tested in the same way a "...research plan should be executed first as a pilot study". It should first be circulated to a few people with the aim of identifying major problems. The subsequently revised questionnaire should then be administered to a small sample of the intended population. The data obtained from this procedure should assist the researcher in the refinement of the layout, direction to the participants and specific items of the questionnaire (Gay 1996 pp. 257-260).

The survey was initially distributed to five colleagues (Training Development Officers) who are knowledgeable about DL activities. The feedback was generally positive on the usefulness of the information to be collected and the appropriateness of intended population. Minor suggestions on the layout of the questionnaire, wording and spelling of the covering letter and specific items were provided. Careful consideration was given to the feedback received and modifications were incorporated as required. The questionnaire was then administered to 10 CAF personnel during the period of November 1 to 4, 2000.

In addition to completing the questionnaire, the respondents were requested to provide feedback on:

- (1) The covering letter to the questionnaire;
- (2) The time required to complete the questionnaire;
- (3) What items were liked/disliked; and
- (4) The on-line survey system.

Again, the feedback was mostly positive. The data collected revealed an average time to complete the survey of approximately 30 minutes. Some minor modifications to the wording of some items were incorporated as a result of this pre-test.

3.1.3 Description of the questionnaire.

Based on the foregoing discussion, the literature review and the author's knowledge of the organization and the field of DL, an original survey was developed. The survey, comprised of 56 items is attached at Appendix 1 and is divided into seven distinct parts as follows:

- (1) Biographical data;
- (2) Knowledge of DL;
- (3) Experience with DL;
- (4) Perceptions of the comparative effectiveness of DL with face-to-face instruction;
- (5) Perceived benefits of DL;
- (6) Perceived disadvantages of DL; and
- (7) Willingness to participate in DL programs.

The biographical data required to paint a portrait of the respondents was identified as gender, age, military occupation, unit or squadron and education level. A description of the population is provided in Part 3.2 of this Chapter.

The second part of the survey was designed to ascertain the respondents' level of knowledge with regard to concepts and technologies used in the field of DL. The participants were requested to indicate their level of knowledge using the ordinal scale described in Table 1. The definitions were adapted from the taxonomy of knowledge used in CF military occupational specifications.

No Knowledge	Never heard or read, anything regarding this concept.
Rudimentary	An awareness of the basic definition and concept.
Basic	The level of understanding of the definition and basic concept which enables the relating of this knowledge to the task at hand.
Detailed	The level of understanding of theory and principles of a topic or body of knowledge that is usually gained through formal training and/or experience .

Table 1

Respondents were requested to rate their knowledge of a list of terms extracted from the literature. Emphasis was placed on the concepts, technologies and/or methodologies in use or that are likely to be used in the CAF in the near future, A synopsis found in the literature was adapted for the specific purpose of the study (Chute, Thompson & Hancock, 1999, p. 24). The following terms were therefore selected:

- (1) DL;
- (2) Synchronous Communications;
- (3) Asynchronous Communications;

- (4) Paper Based Programmed Instruction;
- (5) Audiographics;
- (6) Web Based Training; and
- (7) Desktop video-conferencing.

In the third part of the survey, the focus shifted from the knowledge to the experience of the participants with DL. It was believed that participation in a DL program, the motivating factor for that participation, the type of access to the DL program, coupled with the exact nature of the experience would have a significant impact on their perceptions and attitudes towards DL. The respondents were, therefore, asked: *“Other than the Officer Professional Development Program (OPDP), have you participated in a DL program in the past?”* If they answered “no” the survey system would automatically branch them to the next part of the questionnaire. If they answered “yes”, they were requested to indicate the need for their participation in the program by responding to: *“which of the following best describes the requirement for that training program (choose one or more as appropriate)”*:

- (1) An existing CF qualification required for my job;
- (2) A civilian qualification required for my Job;
- (3) Professional Development;
- (4) Undergraduate Educational Upgrade; and
- (5) Graduate Educational Upgrade.

Participants were then asked where they accessed/studied the courseware for the DL program(s) in question. Finally, based on same adapted synopsis (Chute, Thompson & Hancock, 1999. P. 24), respondents were requested to indicate what type(s) of DL

technologies they had used. A myriad of technologies were grouped along two sets of variables, one-way Vs two-way communications and synchronous Vs asynchronous methodologies. Again the list of options were restricted to existing or potential technologies that are applicable to CAF DL. The list is presented below:

- (1) One way – Paper Based;
- (2) One way – Audiotape;
- (3) One way – Videotape;
- (4) One way – Radio Broadcast;
- (5) One way – Television Broadcast;
- (6) One way – Computer Based Training (CBT);
- (7) One way – Web-Based Training;
- (8) Two way asynchronous (time delay) – Paper Based supplemented by phone, voice mail and/or e-mail;
- (9) Two way asynchronous (time delay) – Audiotape supplemented by phone, voice mail and/or e-mail;
- (10) Two way asynchronous (time delay) – Videotape supplemented by phone, voice mail and/or e-mail;
- (11) Two way asynchronous (time delay) – Audio Broadcast supplemented by phone, voice mail and/or e-mail;
- (12) Two way asynchronous (time delay) – Television Broadcast supplemented by phone, voice mail and/or e-mail;
- (13) Two way asynchronous (time delay) – CBT supplemented by phone, voice mail and/or e-mail;

- (14) Two way asynchronous (time delay) – Web-Based Training;
- (15) Two way synchronous (real time) – Phone, Audio-Conferencing;
- (16) Two way synchronous (real time) – Audiographics;
- (17) Two way synchronous (real time) – Video-Conferencing;
- (18) Two way synchronous (real time) – Desktop Computer-Conferencing; and
- (19) Two way synchronous (real time) – Web-Based Training.

Part four of the questionnaire was designed to measure the respondents' perceptions with regard to the effectiveness of DL. Military personnel participate in a multitude of training and education programs provided by Canadian and foreign militaries. This training is conducted in a manner that is reflective of the unique culture of those institutions. Consistent with this set of values and practices, the Canadian Forces Manual of Individual Training – Volume 11 provides training managers with a list of criteria against which they can measure the effectiveness and efficiency of the training they provide. These criteria can be viewed as attributes of a “good” training program. It was believed, given the respondents familiarity with these attributes, that in order for a DL system to be successful in the CF, the system would have to reproduce or transpose these attributes.

Participants were, therefore, asked if they believed that DL was a methodology that would lend itself to a set of desirable attributes as well as face-to-face instruction.

Respondents were asked to select the choice that corresponds with what they believed. Each statement was organized as described in Table 2.

I believe DL can be as conducive to effective
entry level testing
as face-to-face instruction.

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Table 2

The list of attributes used in the comparison is presented below:

- (1) Entry level testing;
- (2) Sequencing of lessons;
- (3) Presentation of lesson objectives;
- (4) Instructional methods;
- (5) Demonstrations;
- (6) Explanations;
- (7) Participation of course members;
- (8) Use of learning aids (student tools i.e., précis, checklist, flowchart, etc.);
- (9) Use of training aids (instructor tools i.e., whiteboard, slideshow, etc.);
- (10) Provision of reference material for course members;
- (11) Provision of an appropriate number of qualified instructors;
- (12) Supervision of instructional staff;
- (13) Posting of course schedules;
- (14) Student access to the training standard and plan;
- (15) Conduct of formative evaluation (i.e., diagnostic and ongoing);

- (16) Conduct of summative evaluation (i.e. final and for accreditation purposes);
- (17) Communication of feedback on test results;
- (18) Administration of valid (measure what they are suppose to measure) enabling/performance checks;
- (19) Administration of reliable (constant from time to time and student to student) enabling/performance checks;
- (20) Provision of remedial instruction;
- (21) Counselling/tutoring and;
- (22) Course critique program.

Part five of the questionnaire focussed on the perceived benefits of DL. Using a five point interval scale, the respondents were requested to rate a series of perceived benefits ranging from “not at all important to me” to “very important to me”. The following potential benefits were presented to the participants:

- (1) Geographical independence;
- (2) Temporal independence;
- (3) Access to learning opportunities at minimal cost;
- (4) Access to a variety of media and resources to enhance my learning experience;
- (5) Focus on the learning experience without the unnecessary socialization;
- (6) Allows reflection on my own about the material to be learned before I interact with others; and
- (7) Allows reflection about other people’s idea before providing feedback.

Part six of the questionnaire focussed on the perceived disadvantages of DL. Using a five point interval scale, the respondents were requested to indicate if real and/or perceived disadvantages were significant enough to discourage them from engaging in a DL program. They were requested to provide a rating ranging from “not at all significant to me” to “very significant to me”. The following real and/or perceived disadvantages were presented to the participants:

- (1) Depriving me of an opportunity to travel;
- (2) Lack real and live interaction;
- (3) Lack of immediate support and human interaction with my instructor(s);
- (4) Lack of socialization with my peers;
- (5) Lack the structure or guidance required for me to learn; and
- (6) Technical Challenges associated with DL.

Part seven of the questionnaire was aimed at verifying the respondents desire to engage in a DL program for:

- (1) Educational upgrade purposes;
- (2) Professional development purposes; and
- (3) Advanced Military Occupation (MOC) Training.

The specific intent of parts five, six and seven, of the questionnaire were to gather information on the potential users' perceptions of DL, and to later use the information to structure and meet their expectations. It was perceived that the data would provide a sound basis from which communication, marketing and change management strategies could be built on.

3.1.4 The covering letter

There are several questions a respondent may have concerning a study in which he or she is asked to participate. Issues include sponsorship, purpose of study, who is responsible for and who is conducting the study? How did the researcher get his or her name, and is the study confidential? Will the results of the study be available? For what will the results be used, and how is the study going to help them (Sallant & Dillman, 1994, p.154)? Based on the above list of questions and samples examined in the literature review, the covering letter attached at Appendix 2 was developed. The letter was sent via e-mail to Commanding Officers on 01 December 2000. A reminder letter was sent to all Commanding Officers on 15 December 2000.

3.2 Selection of the Population

3.2.1 Subjects and Setting

Subjects for this study were selected from all Air Force personnel, serving in Air Command's 34 operational or operational training units in Canada on 01 December 2000. The units were comprised of squadrons from the Fighter, Transport, Maritime Patrol, Maritime Helicopter and Tactical Helicopter communities. Participants in the study varied in gender, age (18-55), rank (Airman to Lieutenant Colonel) and Military Occupation (MOC) (mainly pilots, navigators, airborne sensor operators, air controllers, aircraft technicians, etc) and education level (from high school to graduate degrees). The established total population was, at the time of the study, comprised of 5775 subjects.

3.2.2 Sampling Methodology.

It was determined early in the preparation of the study that cluster sampling would prove to be the most efficient way to produce a representative sample of the

overall population. It was believed that this sampling methodology, using operational units as a cluster, would provide access to a representative number of subjects while informing the chain of command. A cluster sampling procedure was applied (Gay 1996 p. 120) in the following steps:

- (1) The population was defined and identified (see 3.2.1) with a total number of subjects established at 5775;
- (2) The suggested sample size for educational and psychological measurement for an overall population of 5775 is 361 subjects (Gay 1996). The chance of selecting a sample that is not representative of the population is greater with cluster than with random sampling. Selecting a larger number of the subjects than one would normally do in random sampling is a way to compensate for this drawback. Consequently, it was determined that doubling the number of subjects to 722 would provide an increased safeguard against sampling errors for the study. Given the operational tempo and the perceived overall interest of the population towards DL, an estimated return rate of 50% was assumed. It was, therefore, decided to survey 1444 subjects.
- (3) A cluster is described as an intact group with similar characteristics. Within the Air Force, a valid cluster according to the preceding definition is unquestionably an Air Command operational squadron. These clusters contain similar groupings of subjects by gender, age, rank, MOC and educational level. The list of all 34 clusters (operational units) are consecutively numbered and listed at Appendix 3.

- (4) The average number of personnel by cluster is 170 with a standard deviation of 99. Given that 1444 subjects were desired, it was determined that nine clusters were originally selected. One additional cluster was added to mitigate the high standard deviation of the clusters.
- (5) The clusters (Operational Units) were randomly selected from a total of 34 clusters using a table of ten thousand random numbers. The results are depicted in Table 3:

Operational Unit	Number of Subjects
423 (MH) SQN	217
426 (T) TR SQN	123
429 (T) SQN	98
410 (TAC) FT SQN	226
431 (AD) SQN	28
440(T&R) SQN	41
443 (MH) SQN	260
434 (CS) SQN	216
407 (MP) SQN	301
403 HEL OT	244

Table 3

3.3 Collection of the data

The Defence Information Network (DIN), the Department of National Defence Intranet, was viewed as the vehicle of choice to collect the data required for the study. Under the project management of this author, Mr Joe Coady, P. Eng. from LANGUI Systems developed a proprietary browser-based survey system using 1 Canadian Air Division Headquarters (1 CAD HQ) and CAS PG &T funding. The survey system used in this thesis was designed with two main objectives. The first was to give researchers an easy and effective tool to create questionnaires. The second objective was to give any

selected military individual the ability to easily access and complete the survey using Intranet browser based technology, (i.e. Internet Explorer or Netscape).

To achieve these objectives, the chosen technology was based upon the Sybase Enterprise Application Studio suite of tools. The architecture is based upon a three tier structure with the client (researchers and respondents) being at the first level. The second level is controlled by an application server called the Jaguar transaction server. This level co-ordinates all interfaces between the clients and the database and ensures all business rules relating to the input of questionnaires are performed properly. The third and final level is the database server itself. This is where the actual questionnaire data is stored.

The first level for the survey researchers consists of a Powerbuilder application, on a standard Windows 95 desktop, using the CORBA / IIOP protocol over TCP/IP to access the Jaguar server. This ensures that the user can easily create the questionnaires in an effective windows graphical user interface (GUI) and access a database of personnel to answer the survey. The respondents see the questionnaires using standard browsers. The Sybase PowerDynamo dynamic page server performs the actual display and control of the questions to the respondent. These applications reside on a Microsoft Windows NT server. The third level, the database server itself resides on a third machine within the system and is a Sybase Adaptive Server Anywhere 20 user database. The system configuration is illustrated at Figure 4.

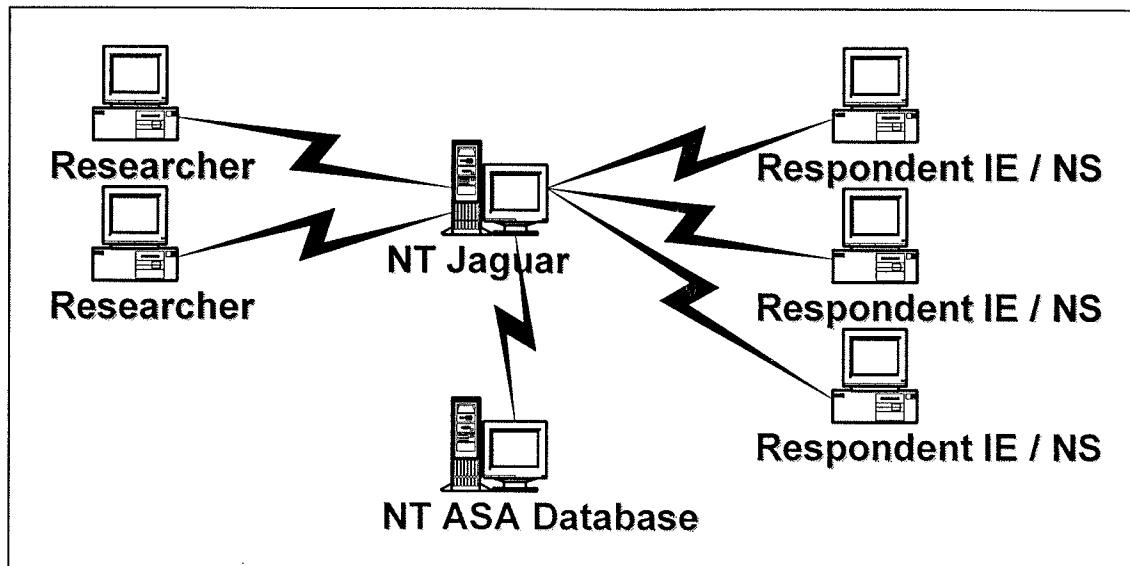


Figure 1

Once the survey system was operational and the questionnaire validated, commanding officers of selected units were reached via military e-mail with the covering letter to the survey provided as an attachment. The original letter was kept on file at the Chief of the Air Staff - Personnel Generation and Training central registry. Commanding Officers were requested to direct their personnel to respond to the survey. Personnel were requested to access a specific URL on the DIN and provide their Service Number (SN). Upon confirmation of their SN, respondents would then be authorized to proceed and complete the web-based on-line questionnaire. Their input was automatically compiled in the above-described database and the date and time of return recorded.

3.4 Treatment of the Data

As indicated above, the data was collated on an ongoing basis in the database. Upon completion of the survey period, the overall response to each item of the survey was displayed in the application using a frequency chart and percentages. In addition, descriptive statistical measure of median for ordinal scales and mean for interval scales, were calculated where appropriate. The data was then ranked accordingly within each part of the questionnaire to facilitate comparisons.

Chapter IV

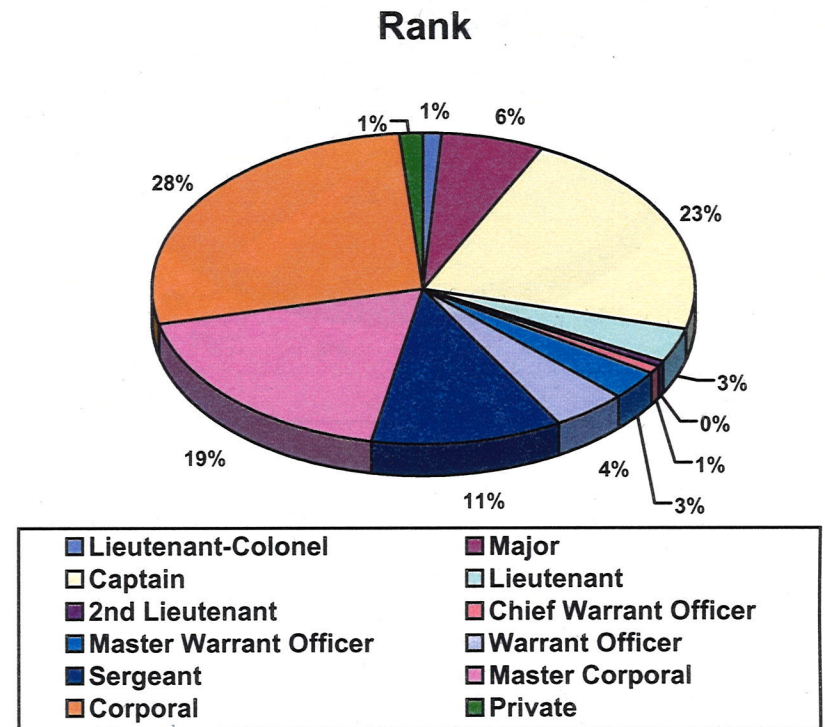
Data Presentation

This chapter reports the results from the data collected. The purpose of this study was to produce a snapshot of CAF personnel perceived knowledge, experiences and perceptions with regard to distance learning. No hypotheses were stated as this study sought to produce a portrait of the situation as of December 2000. 605 CAF personnel responded to the survey representing a 35 % response rate.

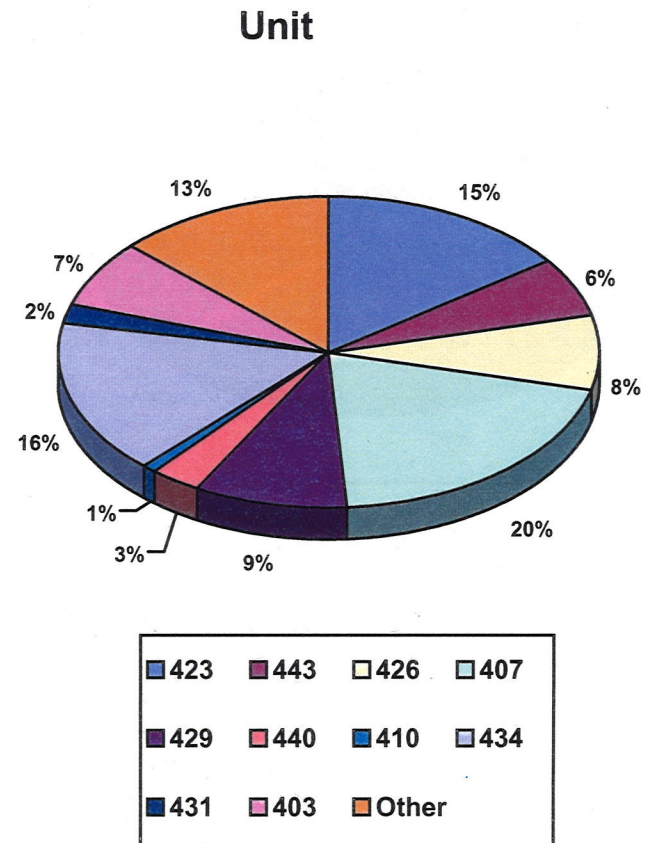
Each part of the questionnaire is introduced by relating it to a specific research question. The questionnaire part is presented using the directions given to the respondents. For each question, a frequency table and a bar graph are presented. The percentage obtained for each category is also indicated. The median case or the arithmetic mean is indicated as appropriate.

At the end of each part, the data is summarized and highlighted in terms of significant findings. Discussion, conclusions and recommendations derived from this chapter are formulated in Chapter V

Rank	
N=605	
	%
Lieutenant-Colonel	1
Major	6
Captain	23
Lieutenant	3
2 nd Lieutenant	.5
Chief Warrant Officer	1
Master Warrant Officer	3
Warrant Officer	4
Sergeant	11
Master Corporal	19
Corporal	28
Private	1

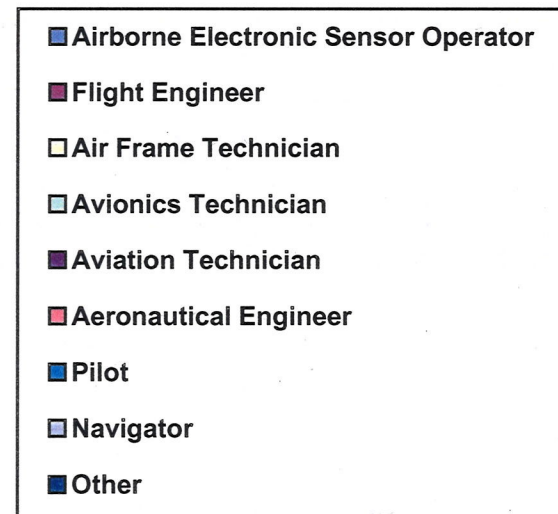
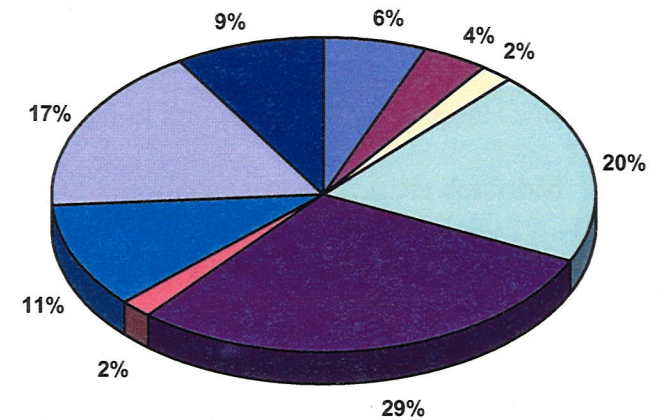


Unit	
N=605	
	%
423 (MH) SQN	15
443 (MH) S	6
426 (T) TR SQN	8
407 (MP) S	20
429 (T) SQ	9
440(T&R) S	3
410 TAC F	1
434 CS SQN	16
431 (AD) SQN	2
403 HEL OT	7
Other	13



Military Occupation

Military Occupation	
N=605	
	%
Airborne Electronic Sensor Operator	6
Flight Engineer	4
Air Frame Technician	2
Avionics Technician	20
Aviation Technician	29
Aeronautical Engineer	2
Pilot	11
Navigator	17
Others	9



4.2 Itemized Data for Knowledge of DL

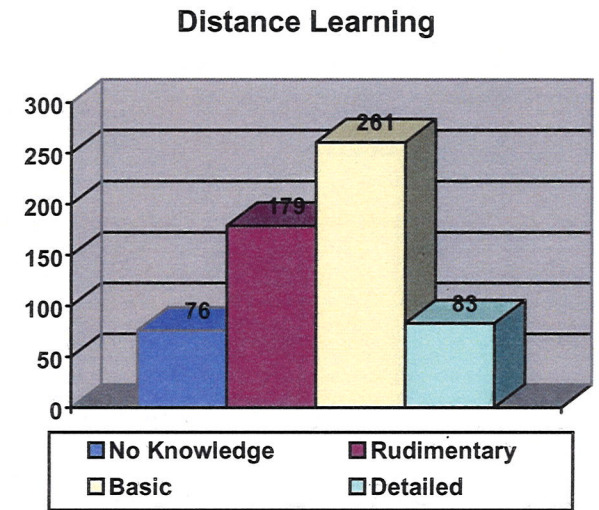
This part of the survey was designed to ascertain the respondents' perceived level of knowledge of the concepts and technologies used in the field of DL. The participants were requested to indicate their level of knowledge using the scale described below (see Part 2). The definitions were adapted from the taxonomy of knowledge used in CF military occupational specifications.

Part 2	Knowledge of Distance Learning	
	The following terminology is employed in defining characteristics of distance learning programmes. Using the scale defined below, please indicate your level of knowledge of each of these terms.	
	No Knowledge →	Never heard or read, anything regarding this concept.
	Rudimentary →	An awareness of the basic definition and concept.
	Basic →	The level of understanding of the definition and basic concept which enables the relating of this knowledge to the task at hand.
Detailed →	The level of understanding of theory and principles of a topic or body of knowledge that is usually gained through formal training and/or experience .	

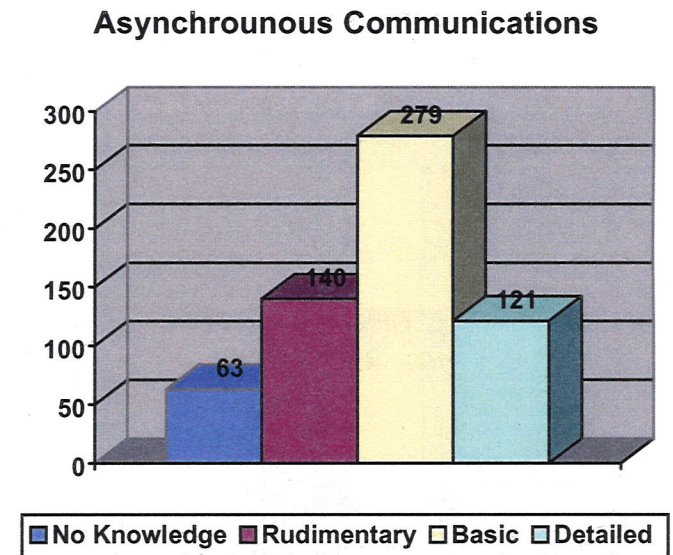


**Indicates the
Median Case**

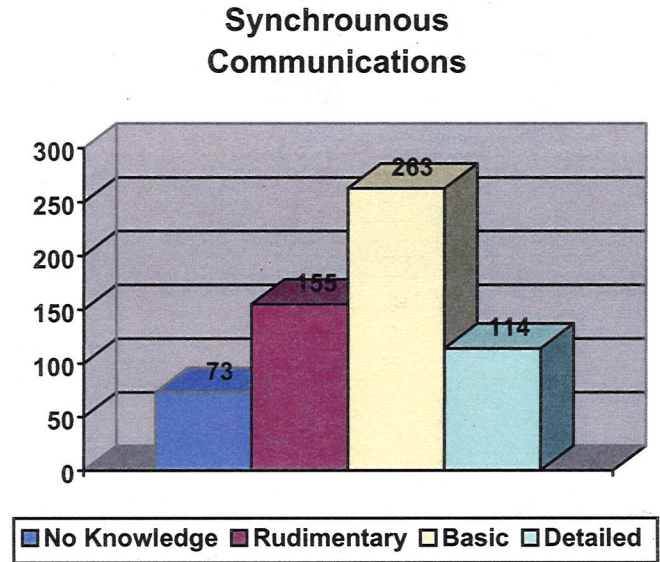
Question 2.1	Distance Learning				
	N = 599 Median = 300				
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	76	179	261	83	6
%	13	30	44	14	



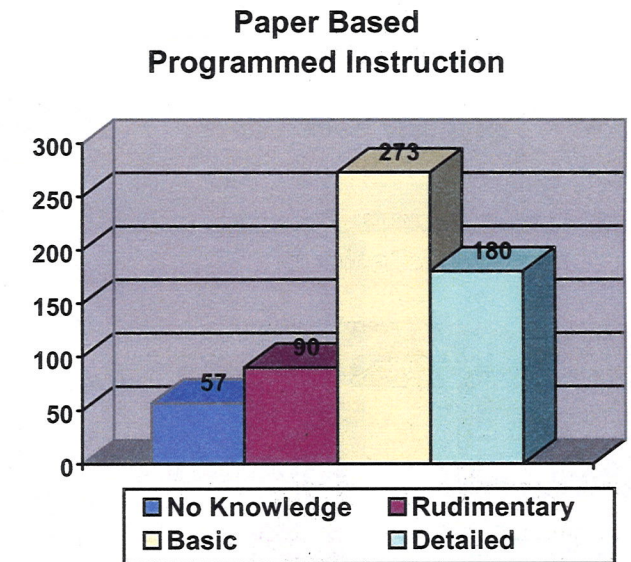
Question 2.2	Asynchronous Communications (A mode of communication such as voice-mail, e-mail and newsgroups that enables non-real-time (time delayed) exchange of information between two or more individuals.)				
	N = 603 Median = 302				
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	63	140	279	121	2
%	10	23	46	20	



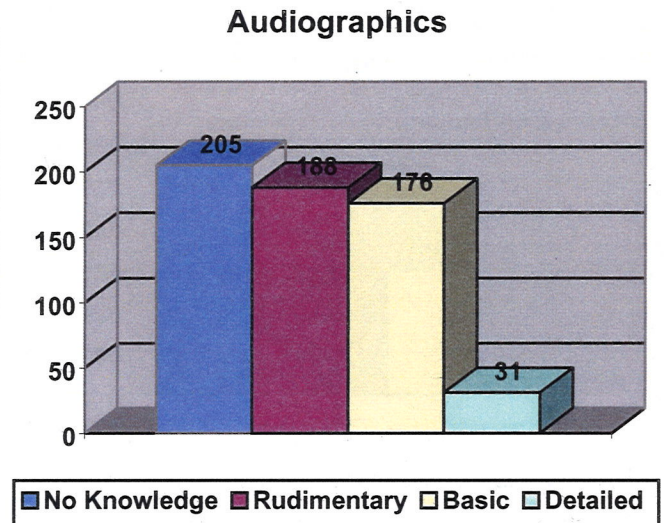
Question 2.3	Synchronous Communications (A mode of communication that enables live, real time exchange of information between two or more individuals.)				
	N = 605 Median = 303				
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	73	155	263	114	0
%	12	26	43	19	



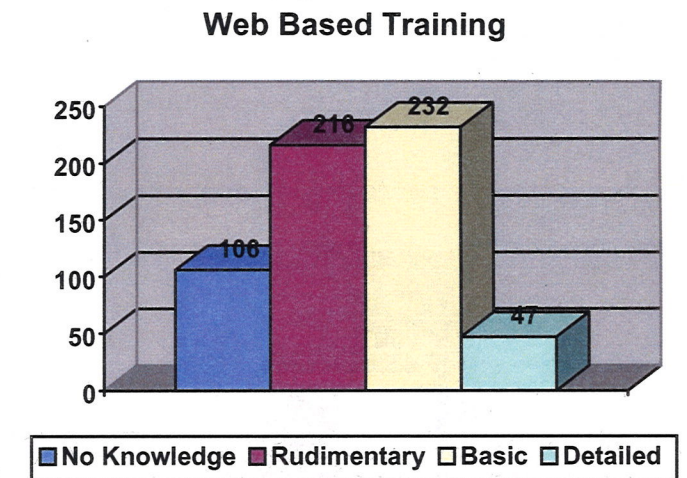
Question 2.4	Paper Based Programmed Instruction				
	N = 600 Median = 301				
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	57	90	273	180	5
%	10	15	46	30	



Question 2.5	Audiographics				
	N = 600 Median = 301				
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	205	188	176	31	5
%	34	31	29	5	

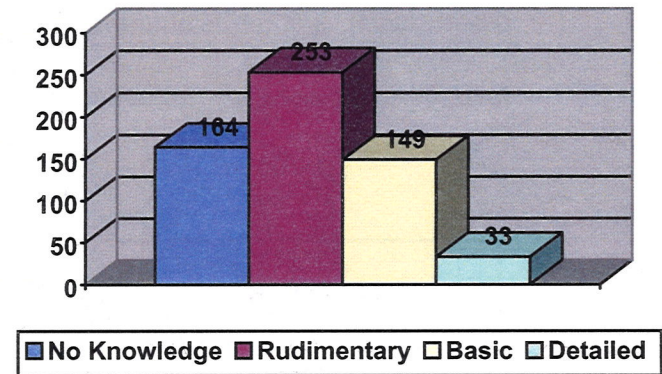


Question 2.6	Web Based Training				
	N = 601 Median = 301				
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	106	216	232	47	4
%	18	36	39	8	



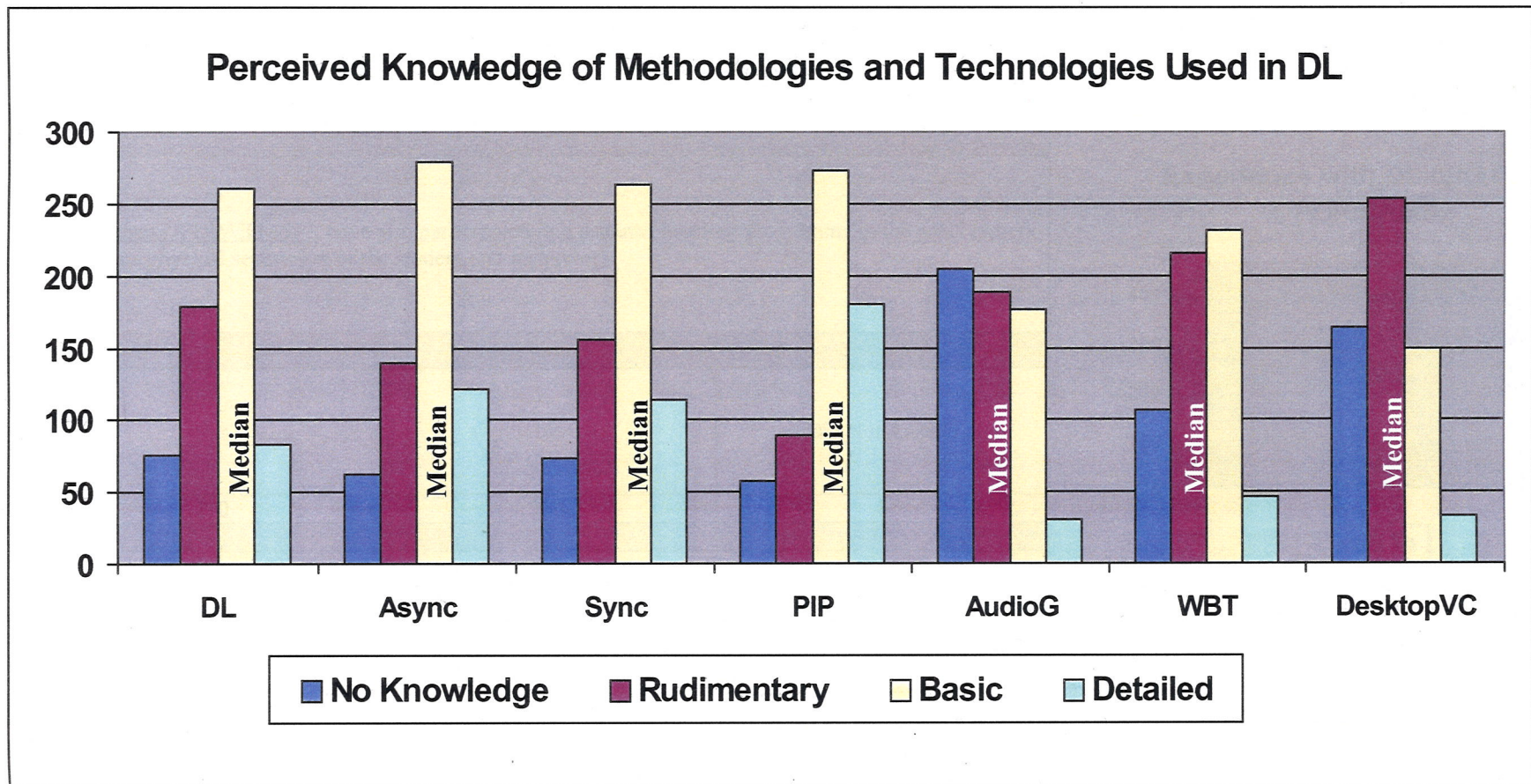
Question 2.7	Desktop videoconferencing				
	N = 599		Median = 300		
Answers	No Knowledge	Rudimentary	Basic	Detailed	Did Not Answer
#	164	253	149	33	6
%	26	42	25	6	

Desktop Video Conferencing



4.3 Data Summary for Knowledge of DL

Summary Graph 1 provides a summary of the level of knowledge of the CAF Personnel. The median respondent has a “Basic” knowledge of the concept of distance learning, asynchronous communication, synchronous communication and paper based programmed instruction. In the case of audiographics, web-based training and desktop video conferencing, the median respondent indicated that he/she had a “Rudimentary” knowledge of these technologies.



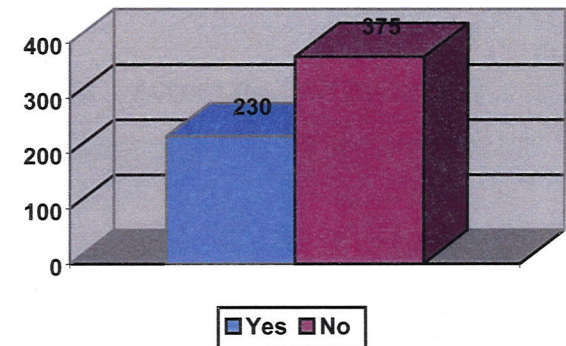
Summary Graph 1

4.4 Itemized Data for Experiences with DL

In the third part of the survey, the focus shifted from the knowledge to the experience of the participants with distance learning. It was believed that participation in a DL programme, the motivating factor for that participation, the type of access to the DL programme, coupled with the exact nature of the experience were important factors in the understanding of the population.

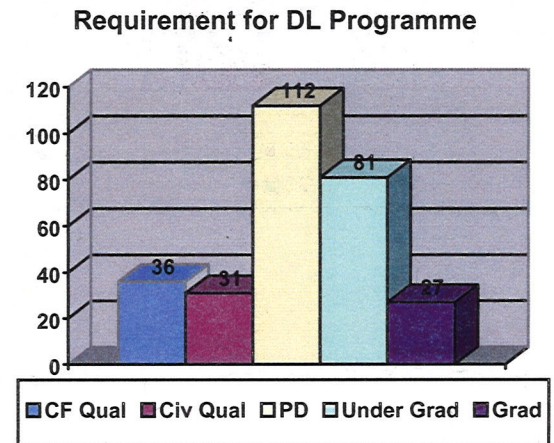
Part 3	Experience with Distance Learning		
Question 3.1	Other than OPDP/CFMSP ¹ , have you participated in a distance learning programme in the past? (where there is a physical separation of the student and instructor)		
N = 605			
Answers	Yes	No	Did Not Answer
#	230	375	0
%	38	62	

Experience with DL other than OPDP/CFMSP

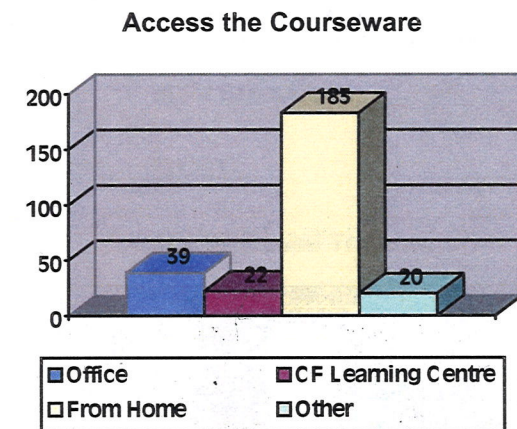


¹ These paper based self-study programs are mandatory for all Canadian Forces officers and were excluded from the research in order to gain insight into the participation of AF personnel to "other" DL experiences.

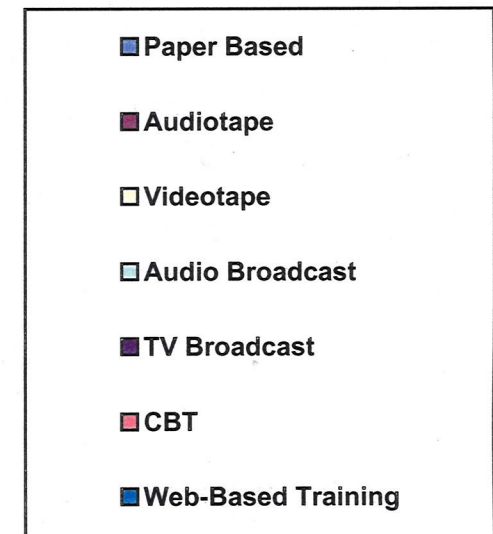
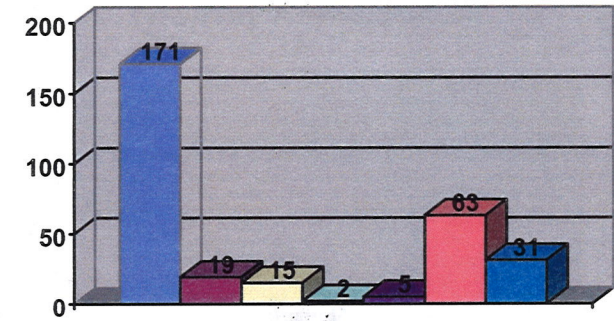
Question 3.2	If you answered <u>Yes</u> to question 3.1, which of the following best describes the requirement for that training programme (choose one or more as appropriate)				
	N = 287				
Answers	An existing CF qualification required for my job	A civilian qualification required for my Job	Professional Development	Undergraduate Educational Upgrade	Graduate Educational Upgrade
#	36	31	112	81	27
%	13	11	39	28	9



Question 3.3	If you answered <u>Yes</u> to question 3.1, which of the following best describes the setting for that training programme (choose one or more as appropriate)			
	N = 264			
Answers	I accessed the programme/studied from my office at the workplace	I accessed the programme/studied from a CF learning centre	I accessed the programme/studied from my home Other	Other
#	39	22	183	20
%	15	8	69	8

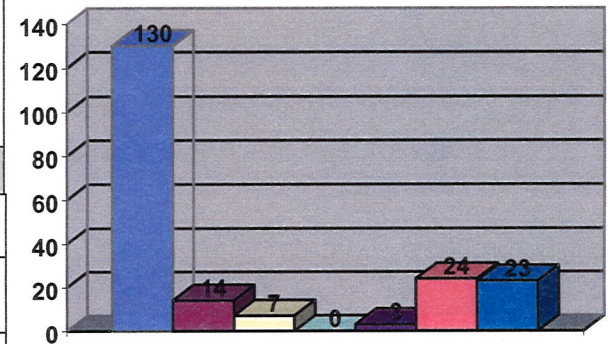


One-Way DL



Question 3.4		Cases = 306 of 563		
If you answered <u>Yes</u> to question 3.1, please indicate what kind of programme(s) you were involved in. Select one or more as applicable.		#	% one-way	% Total Meth.
Answers	One way – Paper Based	171	56	30
	One way – Audiotape	19	6	3
	One way – Videotape	15	5	3
	One way – Radio Broadcast	2	1	0
	One way – Television Broadcast	5	2	1
	One way – Computer Based Training (CBT)	63	21	11
	One way – Web-Based Training	31	10	6
	Total	306	100	54

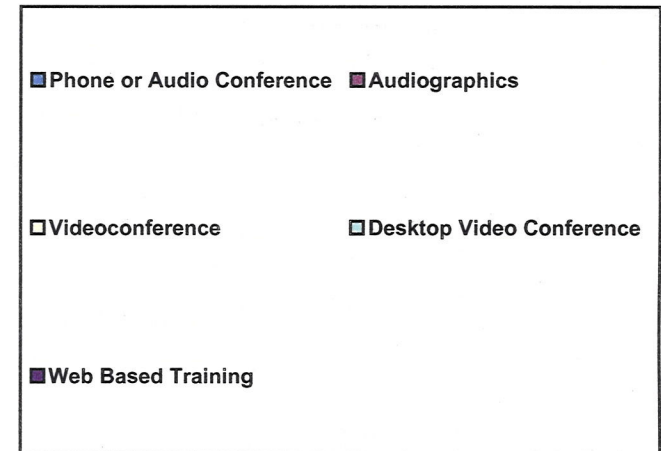
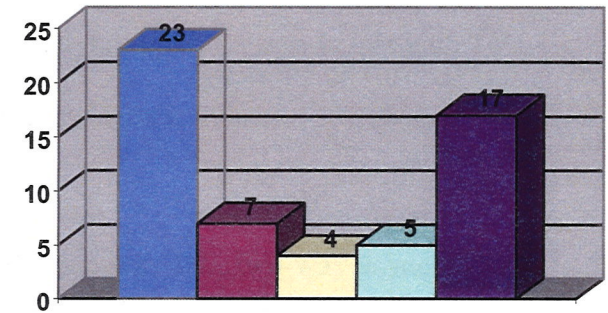
**Participation
Two-Way Asynchronous**



- Paper Based w/ by phone, voice mail and/or e-mail
- Audiotape w/ by phone, voice mail and/or e-mail
- Videotape w/ by phone, voice mail and/or e-mail
- Radio Broadcast w/ by phone, voice mail and/or e-mail
- TV Broadcast w/ by phone, voice mail and/or e-mail
- CBT w/ by phone, voice mail and/or e-mail
- Web-Based Training

Question 3.5		Cases = 201 of 563		
If you answered <u>Yes</u> to question 3.1, please indicate what kind of programme(s) you were involved in. Select one or more as applicable.				
Answers		#	% Async	% Total Meth
	Two way asynchronous (time delay) – Paper Based supplemented by phone, voice mail and/or e-mail	130	65	23
	Two way asynchronous (time delay) – Audiotape supplemented by phone, voice mail and/or e-mail	14	7	2
	Two way asynchronous (time delay) – Videotape supplemented by phone, voice mail and/or e-mail	7	4	1
	Two way asynchronous (time delay) – Radio Broadcast supplemented by phone, voice mail and/or e-mail	0	0	0
	Two way asynchronous (time delay) – Television Broadcast supplemented by phone, voice mail and/or e-mail	3	2	1
	Two way asynchronous (time delay) – CBT supplemented by phone, voice mail and/or e-mail	24	12	4
	Two way asynchronous (time delay) – Web-Based Training	23	11	4
	Total	201	100	36

**Participation
Two-Way Synchronous**

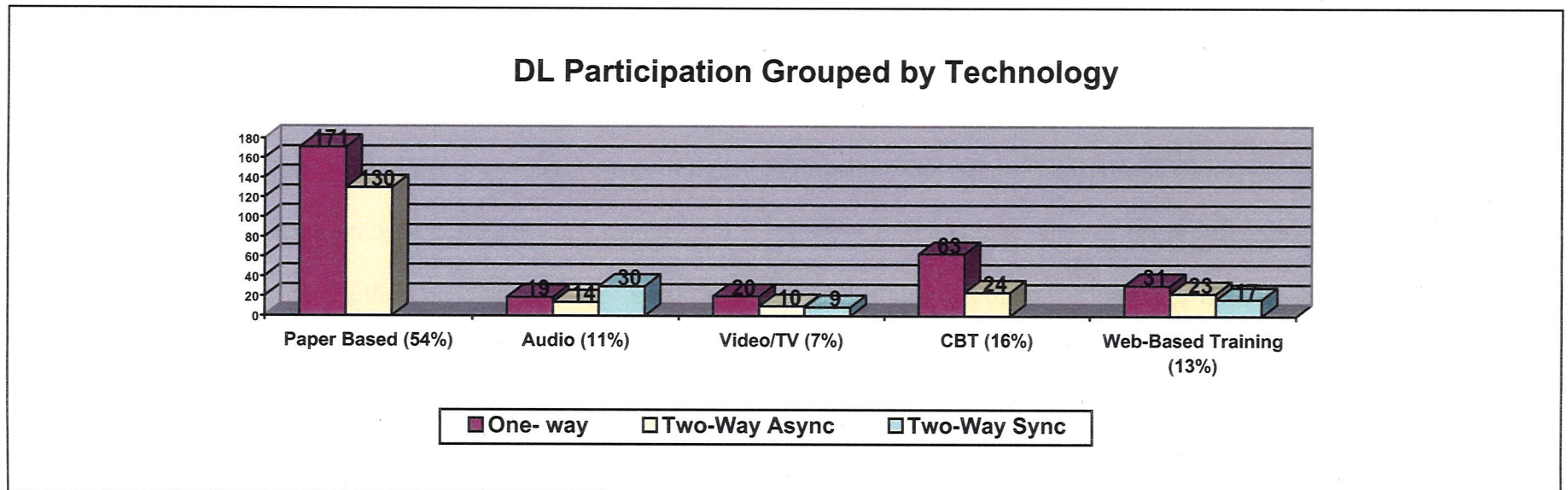


Question 3.6		Cases = 56 of 563		
If you answered <u>Yes</u> to question 3.1, please indicate what kind of programme(s) you were involved in. Select one or more as applicable.		#	% of Sync	% of Total Meth
Answers	Two way synchronous (real time) – Phone, Audio-Conferencing	23	41	4
	Two way synchronous (real time) – Audiographics	7	13	1
	Two way synchronous (real time) – Video-Conferencing	4	7	1
	Two way synchronous (real time) – Desktop Video-Conferencing	5	9	1
	Two way synchronous (real time) – Web-Based Training	17	30	3
	Total	56	100	10

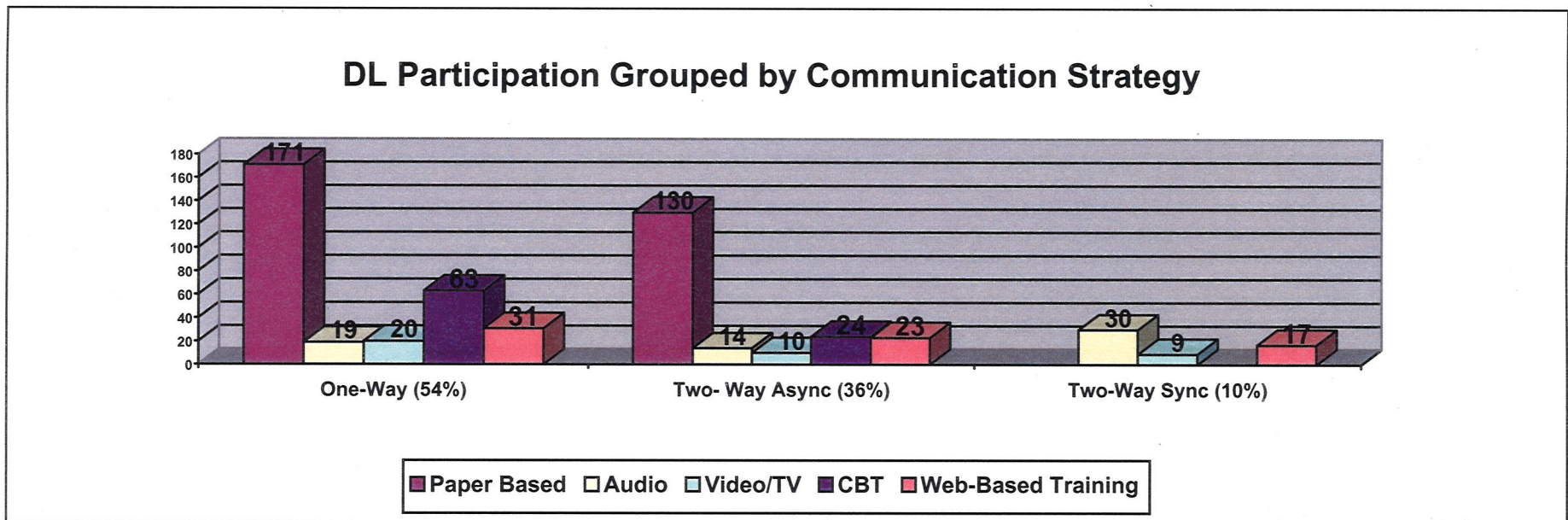
4.5 Data Summary for Experience of DL

As illustrated on page 56-57, 38% of the respondents have participated in a DL programme other than OPDP/CFMSP. Of all the reported cases, 39% of DL programmes were for professional development purposes. 37% were for educational upgrade (undergraduate and graduate). Job related qualifications (CF or civilian) fulfilled through DL came in last with 24%. When it comes to access, 69% of the cases were learning/studying the courseware from their home, 15% accessed the courseware from their office and 8% from a CF learning centre.

As depicted in Summary Graph 2 & 3 (below), 54% of the reported cases were one-way DL, two-way asynchronous DL was indicated in 36% of the cases, while 10% of the cases were reported as two-way synchronous. With regard to the methodology and technology used to participate in DL, paper based instruction was used 54% of time followed by CBT with 16%, WBT with 13%, audio technologies 11% and video/TV with 7%. The table below summarizes the participation in terms of technologies and student-student or student-instructor interaction.



Summary Graph 2



Summary Graph 3

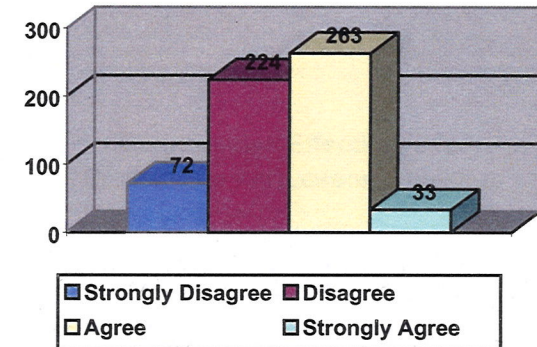
4.6 Itemized Data for DL Vs Face-to-face Instruction

The fourth part of the questionnaire was designed to measure respondents' perceptions with regard to the effectiveness of DL. Military training is conducted in a manner that is reflective of the unique ethos of the organization. Given this set of values and practices, the Canadian Forces Manual of Individual Training – Volume 11 provides training managers with a list of criteria against which they can measure the effectiveness and efficiency of the training they provide. These criteria can be viewed as attributes of a “good” training programme. Participants were therefore asked if they believe that distance learning, could be produced with the same set of desirable attributes as face-to-face instruction.

Part 4	<p>Comparative Effectiveness</p> <p>The Canadian Forces Manual of Individual Training – Volume 11 provides training managers with a list of criteria against which they can measure the effectiveness and efficiency of the training they provide. These criteria can be viewed as attributes of a “good” training programme.</p> <p>In this part of the survey, you will be asked if you believe that <u>Distance Learning</u>, when compared to <u>Face-to-face Instruction</u>, can be produced with the same set of desirable attributes.</p> <p>For each question, select the choice that corresponds with what you believe.</p>				
	Question 4.1	<p>I believe distance learning can be as conducive to effective entry level testing as face-to-face instruction.</p>			
N = 592 Median = 297					
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 13
#	72	224	263	33	
%	12	38	44	6	
	50		50		

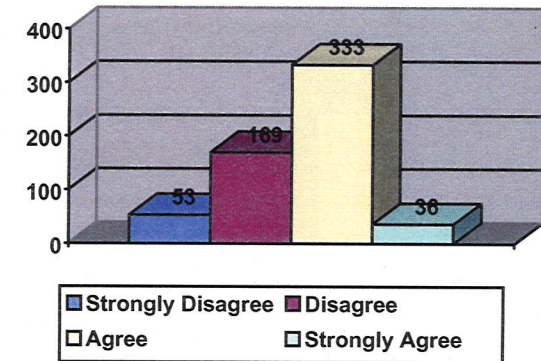
Indicates the Median Case

Comparative Effectiveness for Entry Level Testing



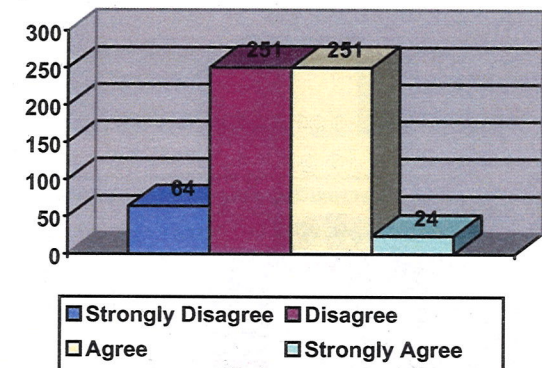
Question 4.2	I believe distance learning can be as conducive to the logical sequencing of lessons within a course syllabus as face-to-face instruction.				
	N = 591 Median = 296				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 14
#	53	169	333	36	
%	9	29	56	6	
	38		62		

Comparative Effectiveness for Logical Sequencing of Lessons



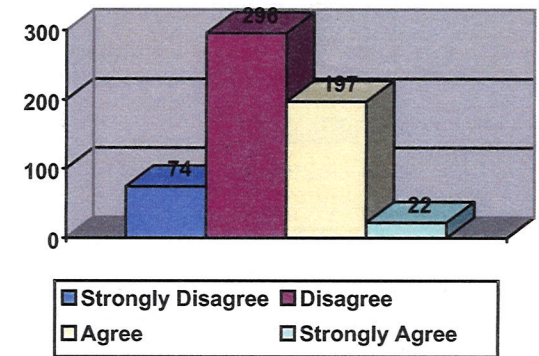
Question 4.3	I believe distance learning can be as conducive to the presentation of learning objectives as face-to-face instruction				
	N = 590 Median = 296				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 15
#	64	251	251	24	
%	11	43	43	4	
	53		47		

Comparative Effectiveness for Presentation of Lesson Objective

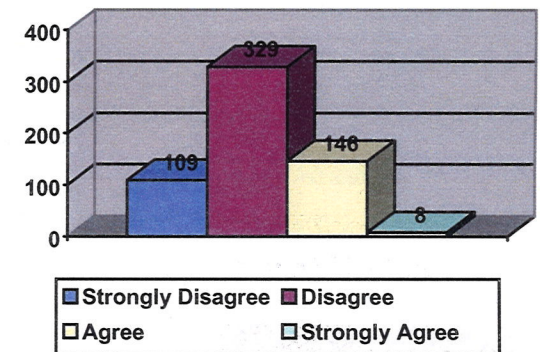


Question 4.4	I believe distance learning can be as conducive to the use of sound instructional methods as face-to-face instruction.				
	N = 589 Median = 295				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 16
#	74	296	197	22	
%	13	50	33	4	
	63		37		

Comparative Effectiveness for Instructional Methods



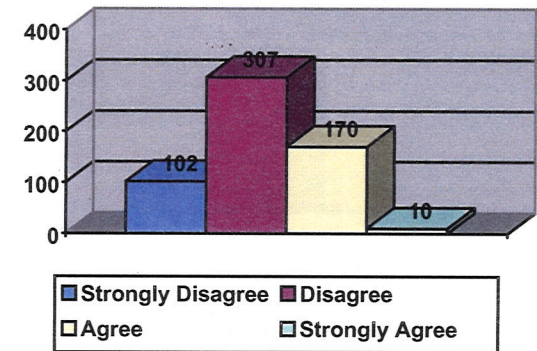
Comparative Effectiveness for Demonstrations



Question 4.5	I believe distance learning can be as conducive to effective demonstrations as face-to-face instruction.				
	N = 592 Median = 297				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 13
#	109	329	146	8	
%	18	56	25	1	
	74		26		

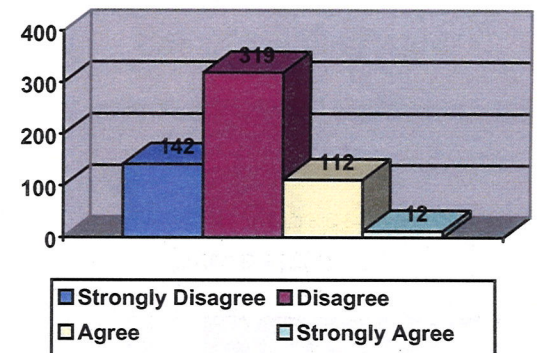
Question 4.6	I believe distance learning can be as conducive to effective explanations as face-to-face instruction				
	N = 589 Median = 295				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 16
#	102	307	170	10	
%	17	52	29	2	
	69		31		

Comparative Effectiveness for Explanations



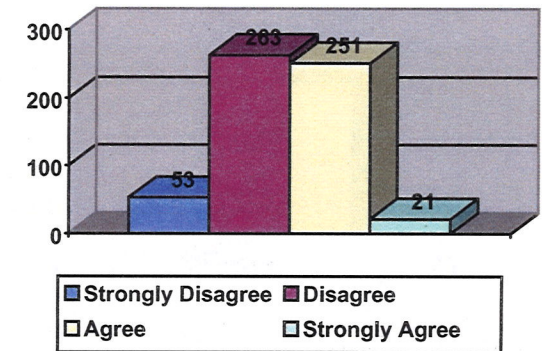
Question 4.7	I believe distance learning can be as conducive to the active participation of course members as face-to-face instruction				
	N = 585 Median = 293				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 20
#	142	319	112	12	
%	24	55	19	2	
	79		21		

Comparative Effectiveness for Active Participation



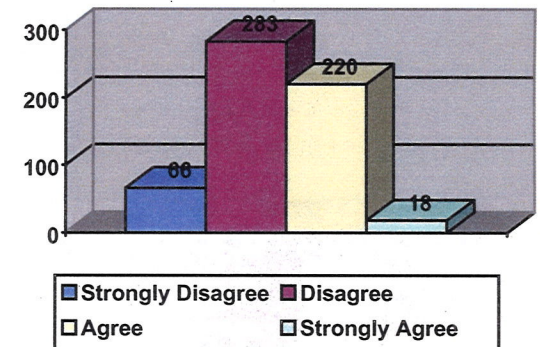
Question 4.8	I believe distance learning can be as conducive to the effective use of learning aids (student tools i.e., précis, checklist, flowchart, etc) as face-to-face instruction.				
	N = 588 Median = 295				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 17
#	53	263	251	21	
%	9	45	43	4	
	54		46		

Comparative Effectiveness for Use of Learning Aids



Question 4.9	I believe distance learning can be as conducive to the effective use of training aids (instructor tools i.e., whiteboard, slideshow, etc.) as face-to-face instruction				
	N = 587 Median = 294				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 18
#	66	283	220	18	
%	11	48	37	3	
	59		41		

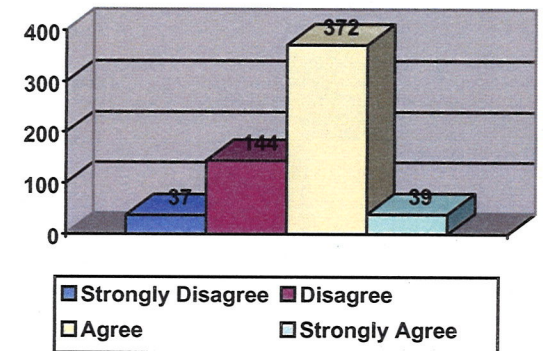
Comparative Effectiveness for Use of Training Aids



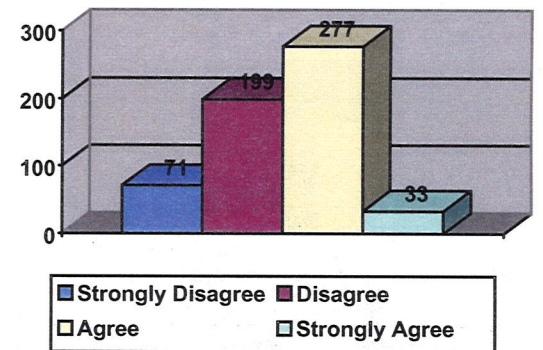
Question 4.10	I believe distance learning can be as conducive to the availability of required reference material for course members as face-to-face instruction.				
	N = 592 Median = 297				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 13
#	37	144	372	39	
%	6	24	63	7	
	31		69		

Question 4.11	I believe distance learning can be as conducive to the provision of an appropriate number of qualified instructors as face-to-face instruction.				
	N = 580 Median = 291				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 56
#	71	199	277	33	
%	12	34	48	6	
	47		53		

Comparative Effectiveness for Availability of Ref Material

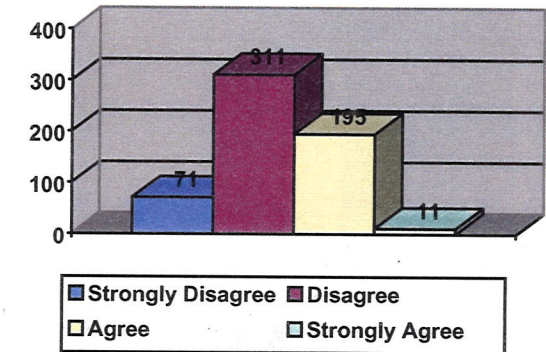


Comparative Effectiveness for Appropriate # of Instructors

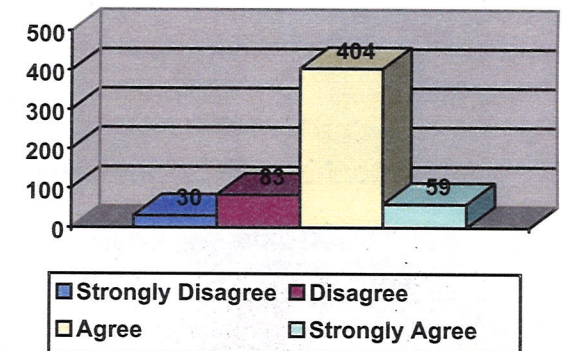


Question 4.12	I believe distance learning can be as conducive to the supervision of instructional staff as face-to-face instruction.				
	N = 588 Median = 295				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 17
#	71	311	195	11	
%	12	53	33	2	
	65		35		

Comparative Effectiveness for Supervision of Instrutors



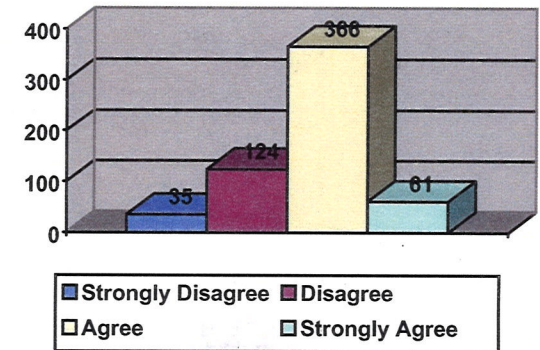
Comparative Effectiveness for Posting of Crse Schedules



Question 4.13	I believe distance learning can be as conducive to the posting of course schedules as face-to-face instruction.				
	N = 576 Median = 289				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 29
#	30	83	404	59	
%	5	14	70	10	
	20		80		

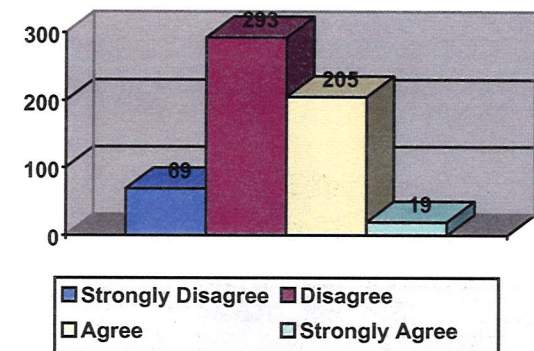
Question 4.14	I believe distance learning can be as conducive to students having access to the training standard and training plan as face-to-face instruction.				
	N = 586 Median = 294				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 19
#	35	124	366	61	
%	6	21	62	10	
	27		73		

Comparative Effectiveness for Access to TS & TP



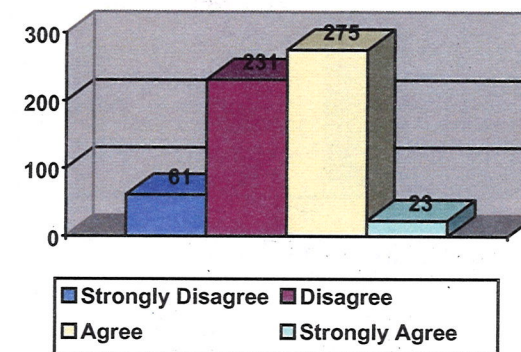
Question 4.15	I believe distance learning can be as conducive to the conduct of formative evaluation (i.e., diagnostic and ongoing) as face-to-face instruction.				
	N = 586 Median = 294				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 19
#	69	293	205	19	
%	12	50	35	3	
	62		38		

Comparative Effectiveness for Formative Evaluation



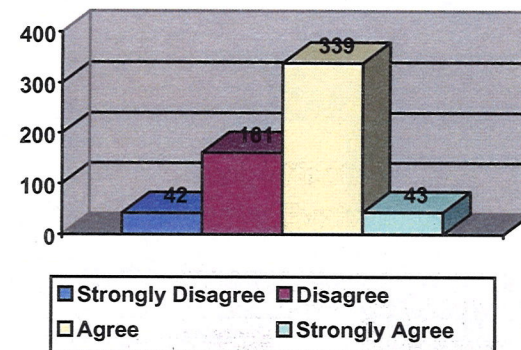
Question 4.16	I believe distance learning can be as conducive to the conduct of summative evaluation (i.e., final and for certification purposes) as face-to-face instruction.				
	N = 590 Median = 296				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 15
#	61	231	275	23	
%	10	39	47	4	
	49		51		

Comparative Effectiveness for Summative Evaluation



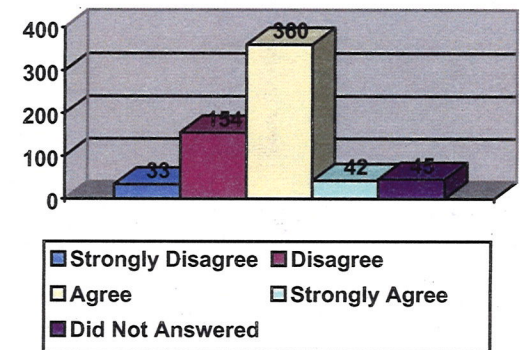
Question 4.17	I believe distance learning can be as conducive to the administration of valid (measure what they suppose to measure) tests as face-to-face instruction.				
	N = 585 Median = 293				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 20
#	42	161	339	43	
%	7	28	58	7	
	35		65		

Comparative Effectiveness for Valid Tests



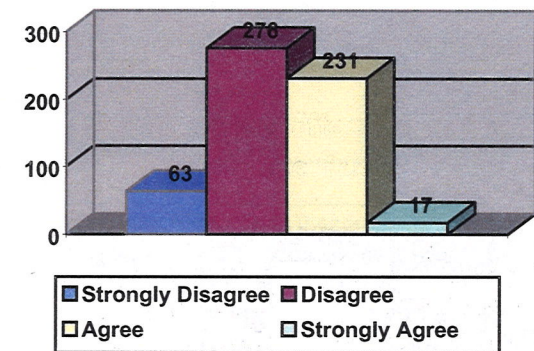
Question 4.18	I believe distance learning can be as conducive to the administration of reliable (constant from time to time and student to student) tests as face-to-face instruction.				
	N = 589 Median = 295				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 16
#	33	154	360	42	
%	6	26	61	7	
	32		68		

Comparative Effectiveness for Reliable Tests



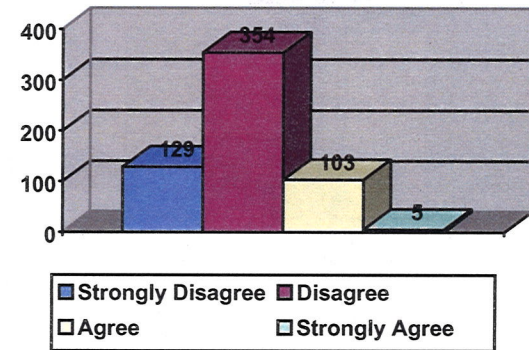
Question 4.19	I believe distance learning can be as conducive to the communication of effective feedback on test results as face-to-face instruction.				
	N = 587 Median = 294				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 18
#	63	276	231	17	
%	11	47	39	3	
	58		42		

Comparative Effectiveness for Feedback on Test Results



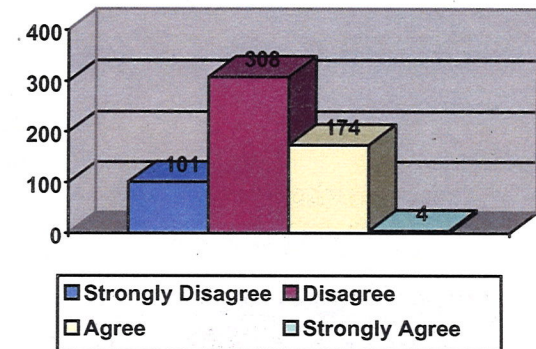
Question 4.20	I believe distance learning can be as conducive to effective counselling/tutoring as face-to-face instruction.				
	N = 591 Median = 296				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 14
#	129	354	103	5	
%	22	60	17	1	
	82		18		

Comparative Effectiveness for Tutoring & Counselling



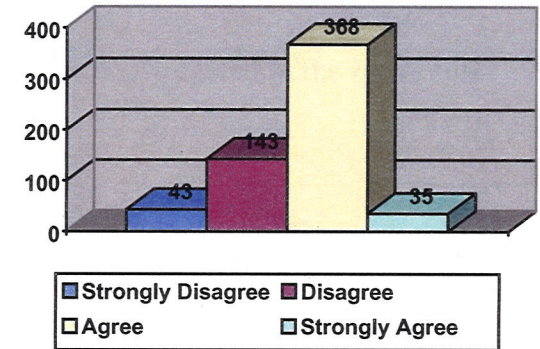
Question 4.21	I believe distance learning can be as conducive to the provision of effective remedial instruction as face-to-face instruction				
	N = 587 Median = 294				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 18
#	101	309	174	4	
%	17	52	30	1	
	70		30		

Comparative Effectiveness for Remedial Instruction



Question 4.22	I believe distance learning can be as conducive to an effective course critique programme as face-to-face instruction.				
	N = 589 Median = 295				
Answers	Strongly Disagree	Disagree	Agree	Strongly Agree	Did Not Answer 16
#	43	143	368	35	
%	7	24	62	6	
	32		68		

Comparative Effectiveness for Crse Critique Program

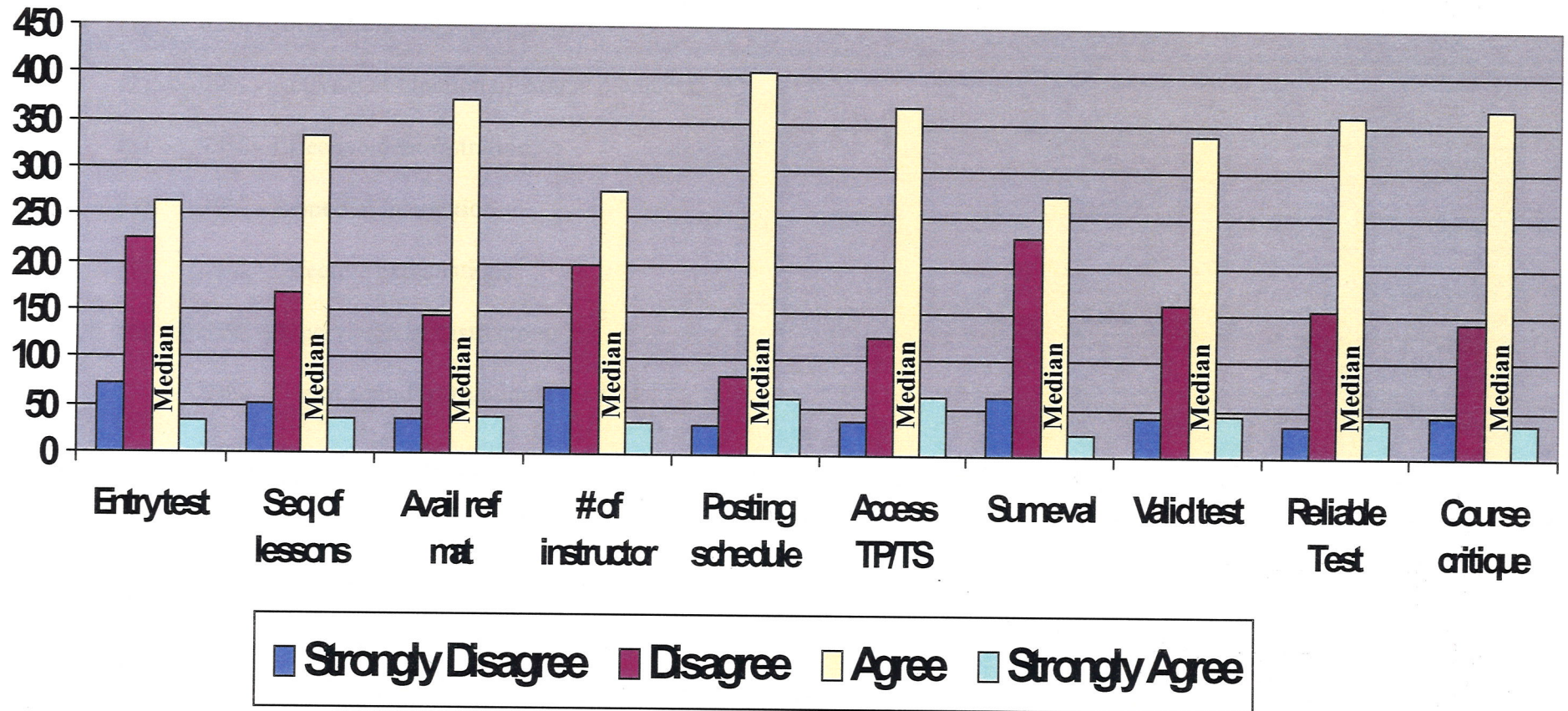


4.7 Data Summary for DL Vs Face-to-face Instruction

As depicted in Summary Graph 4 (below), the median respondent has indicated that he/she agrees that distance learning can be as conducive for 10 of the 22 attributes as face-to-face instruction. The respondents either agreed or strongly agreed in the respective percentage terms for the following attributes:

- (a) 80% - Posting of course schedules;
- (b) 73% - Access to training plan training standard;
- (c) 69% - Availability of reference material;
- (d) 68% - Reliable testing;
- (e) 68% - Course critique programme;
- (f) 65% - Valid testing;
- (g) 62% - Sequencing of lessons;
- (h) 53% - Provision of a sufficient number of qualified instructor;
- (i) 51% - Summative evaluation; and
- (j) 50% - Entry level testing.

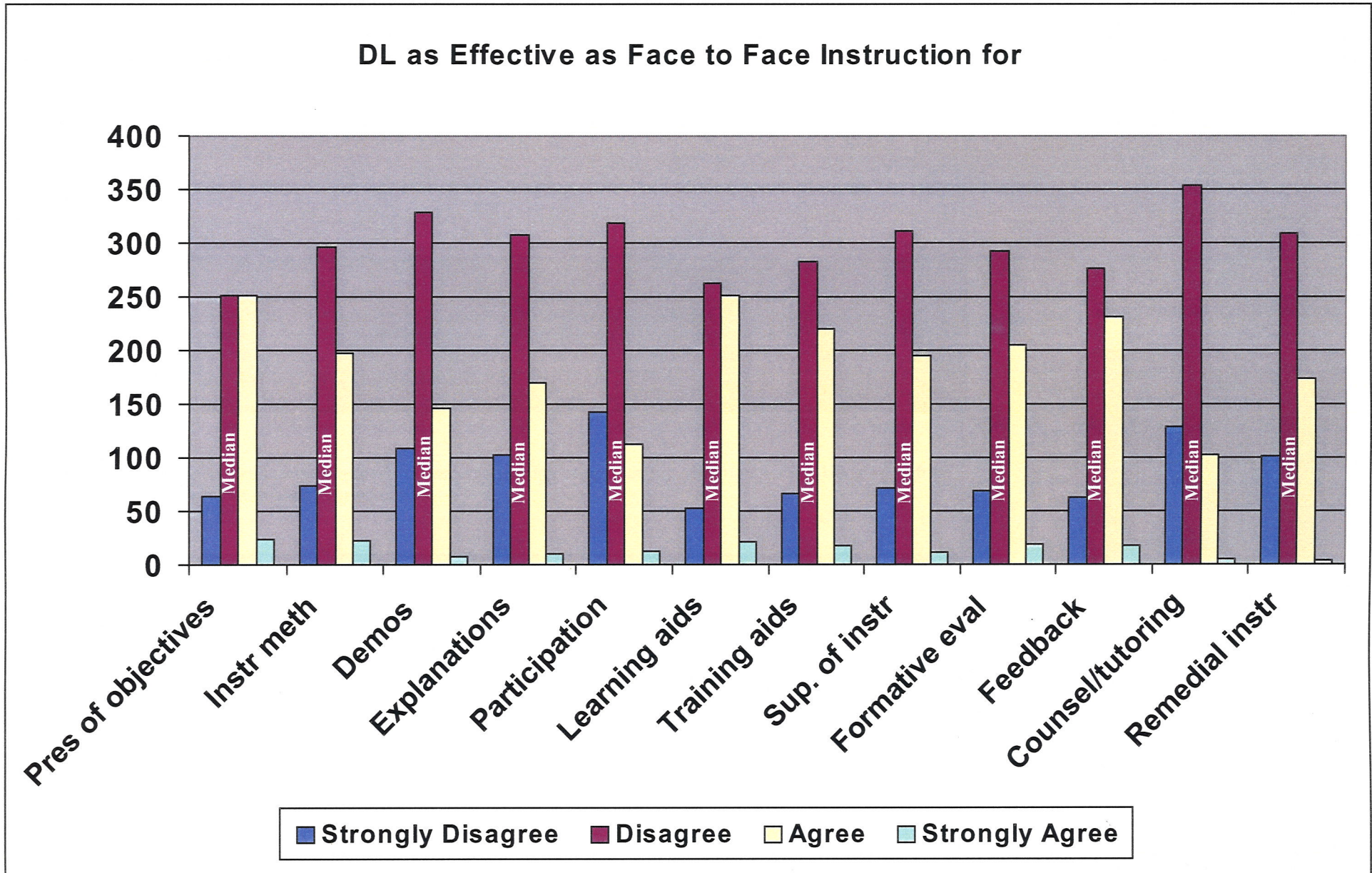
DL is as Effective as Face to Face Instruction for:



Summary Graph 4

As depicted in Summary Graph 5 (below), the median respondent has indicated that he/she disagrees that distance learning can be as conducive for 12 of the 22 attributes as face-to-face instruction. The respondents either disagreed or strongly disagreed in the respective percentage terms for the following attributes:

- (1) 82% -Counselling and tutoring;
- (2) 79% - Active participation of course members;
- (3) 74% - Effective demonstration;
- (4) 70% - Remedial instruction;
- (5) 69% - Effective explanations;
- (6) 65% - Supervision of Instructors;
- (7) 63% - Use of sound instructional methods;
- (8) 62% - Formative evaluation;
- (9) 59% - Use of training aids;
- (10) 58% - Provision of effective feedback on tests results;
- (11) 54% - Use of learning aids; and
- (12) 53% - Presentation of lesson objectives.

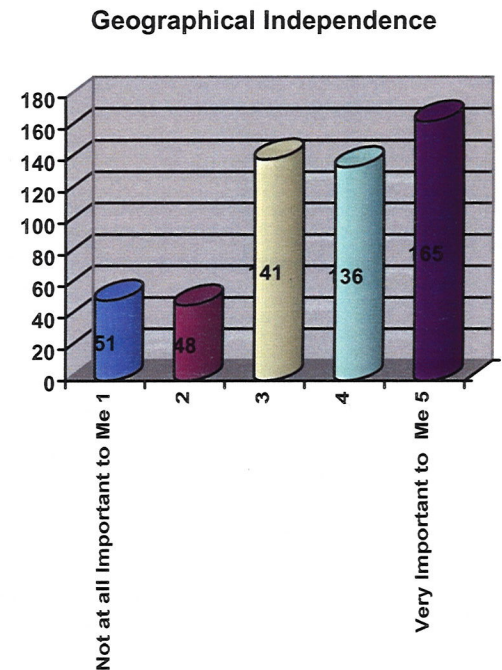


Summary Graph 5

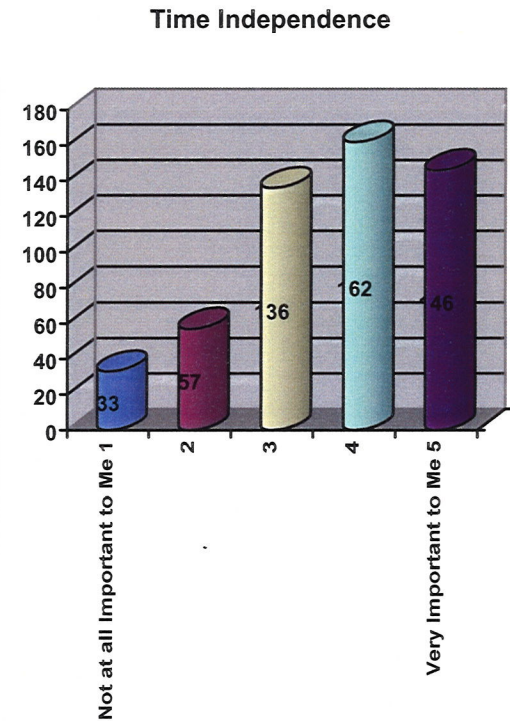
4.8 Itemized Data for Perceived Benefits of DL

Part 6 of the questionnaire focussed on the perceived benefits of DL. Using a five point interval scale, the respondents were requested to rate a series of perceived benefits ranging from “not at all important to me” to very important to me”.

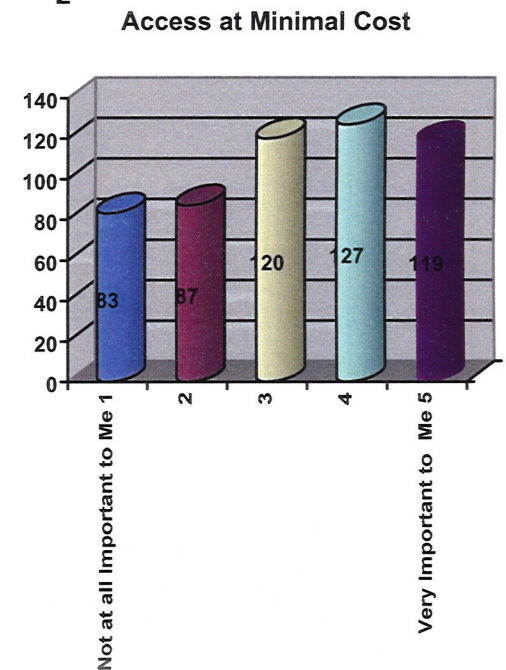
Part 6	Perceived Benefits of Distance Learning							
	Using a distance learning methodology with the appropriate mix of synchronous (same time, different place) and asynchronous (different time, different place) communication to deliver training and education comes with real/perceived benefits. In the next part of this survey, you are asked to indicate how you view the importance of these issues.							
Question 6.1	Geographical independence. I can undergo training or upgrade my education without being away from home for an extended period of time							
N = 541								
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		51	48	141	136	165		64
%		9	9	26	25	30	Mean = 3.6	



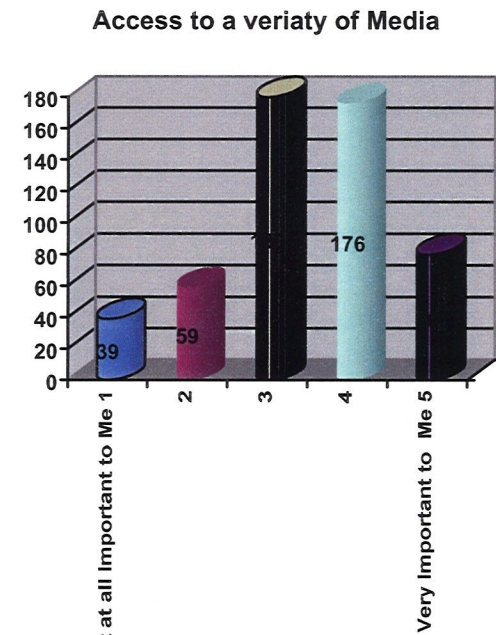
Question 6.2	Time Independence. I can undergo training or upgrade my education at my own pace, managing my time in a way that best suits my study habits.							
	N = 534							
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		33	57	136	162	146		71
%		6	11	25	30	27	Mean =3.6	



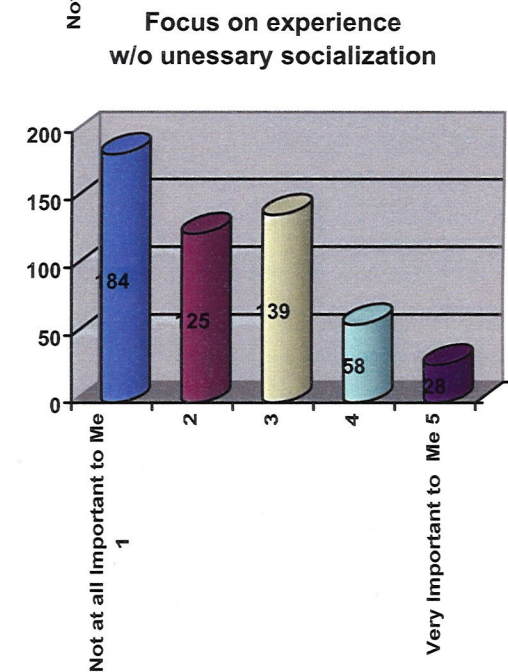
Question 6.3	Gives me access to learning opportunities at minimal cost.							
	N = 536							
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		83	87	120	127	119		69
%		15	16	22	24	22	Mean =3.2	



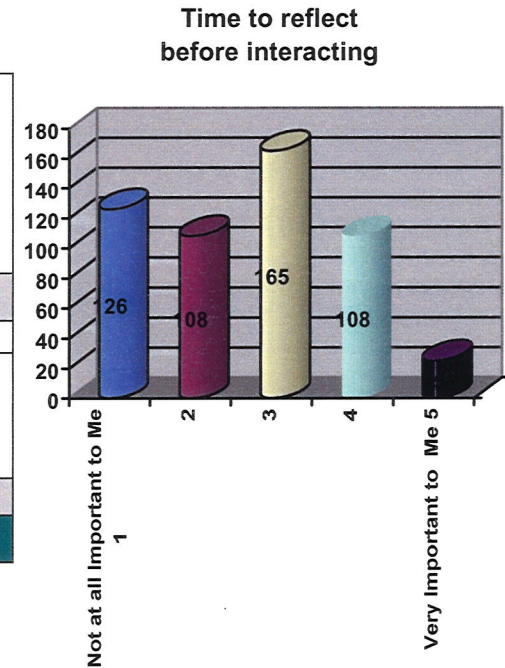
Question 6.4	Gives me access to a variety of media and resources to enhance my learning experience.							
	N = 534							
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		39	59	180	176	80		71
%		15	16	22	24	22	Mean = 3.2	



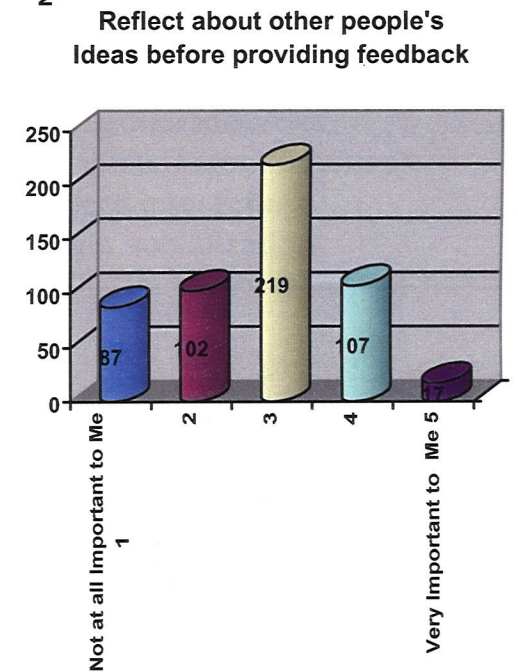
Question 6.5	Lets me focus on the learning experience without the unnecessary socialization.							
	N = 534							
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		184	125	139	58	28		71
%		34	23	26	11	5	Mean = 2.3	



Question 6.6	Allows me to reflect on my own about the material to be learned before I interact with others.							
	N = 532							
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		126	108	165	108	25		73
%		24	20	31	20	5	Mean = 2.6	



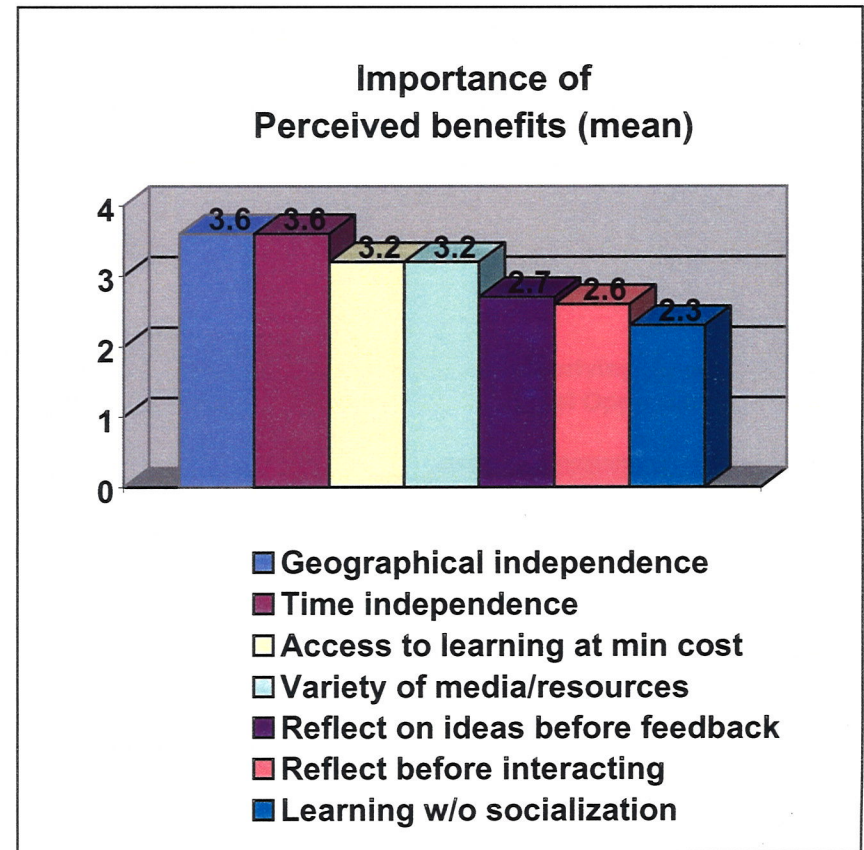
Question 6.7	Allows me to reflect about other people's idea before providing feedback.							
	N = 532							
Answers	Not at all important to me	1	2	3	4	5	Very important to me	Did not respond
		87	102	219	107	17		73
%		16	19	41	20	3	Mean = 2.7	



4.9 Data Summary for Perceived Benefits of DL

As depicted in Summary Graph 6, the arithmetic mean for the perceived benefits where "1" is not at all important to me and "5" is very important to me are presented below from highest to lowest:

- (1) 3.6 - Geographical independence;
- (2) 3.6 - Time independence;
- (3) 3.2 - Access to learning at min cost;
- (4) 3.2 - Variety of media/resources;
- (5) 2.7 - Reflect on ideas before feedback;
- (6) 2.6 - Reflect before interacting; and
- (7) 2.3 - Learning w/o socialization

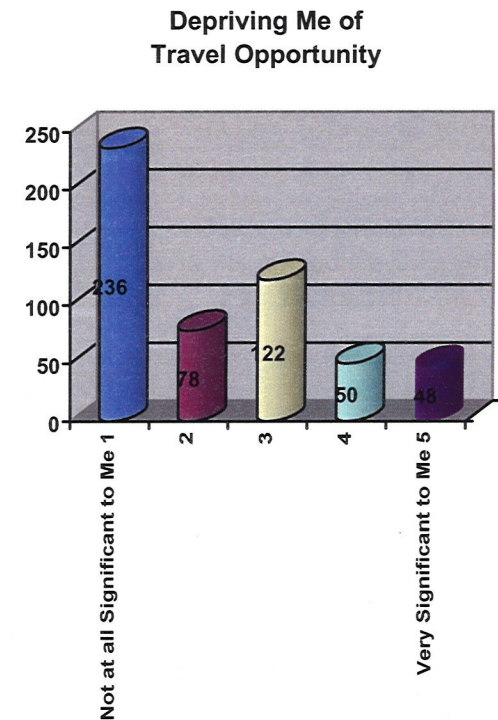


Summary Graph 6

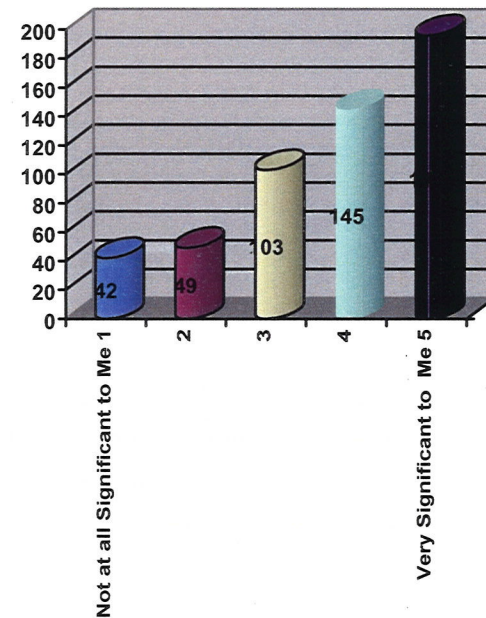
4.10 Itemized Data for Perceived Disadvantages of DL

Part 7 of the questionnaire focussed on the perceived disadvantages of DL. Using a five point interval scale, the respondents were requested to rate a series of perceived benefits ranging from “not at all significant to me” to very significant to me”.

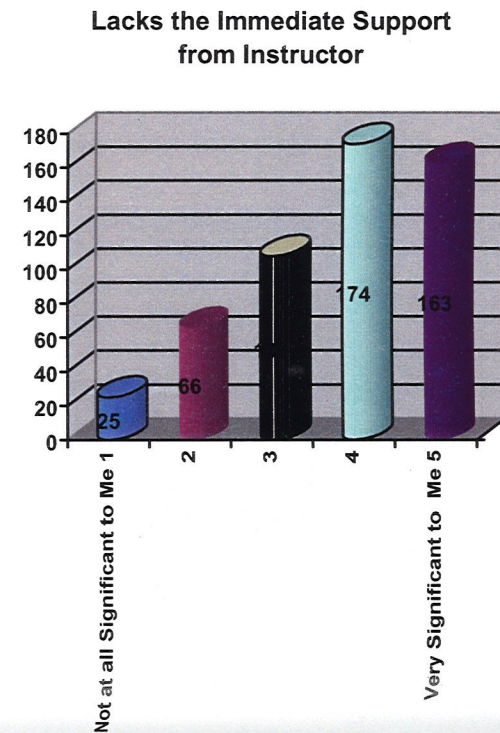
Perceived Disadvantages of Distance Learning								
Part 7	Using a distance learning methodology to deliver training and education comes with real/perceived disadvantages. In the next part of this survey, you are asked to indicate if the following issues are significant enough to discourage you from engaging in a distance learning programme.							
Question 7.1	Depriving me of an opportunity to travel							
N = 534								
Answers	Not at all significant to me	1	2	3	4	5	Very significant to me	Did not respond
		236	78	122	50	48		71
%		44	15	23	9	9	Mean = 2.2	



Question 7.2	Lack real and live interaction with my instructor(s) and other students							
	N = 535							
Answers	Not at all significant to me	1	2	3	4	5	Very significant to me	Did not respond
		42	49	103	145	196		71
%		8	9	19	27	37	Mean = 3.8	

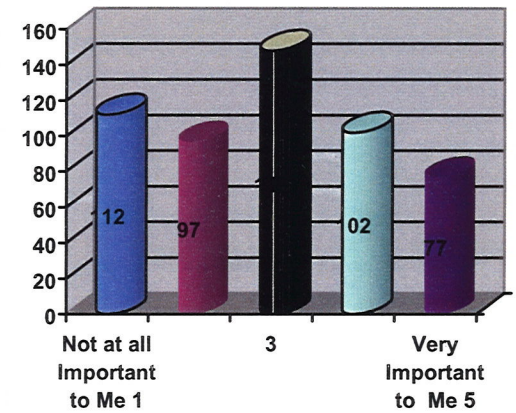


Question 7.3	Lack of immediate support required form instructor(s)							
	N = 536							
Answers	Not at all significant to me	1	2	3	4	5	Very significant to me	Did not respond
		25	66	108	174	163		69
%		5	12	20	32	30	Mean = 3.7	



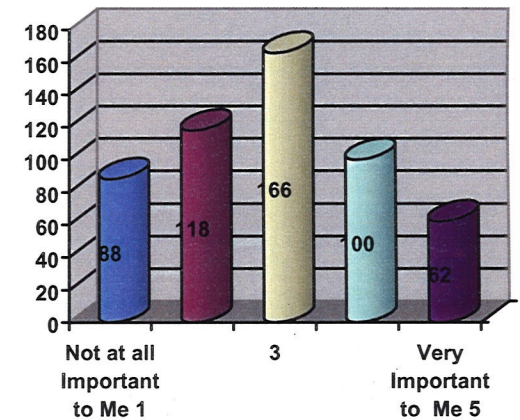
Question 7.4	Lack of socialization with my peers							
	N = 536							
Answers	Not at all significant to me	1	2	3	4	5	Very significant to me	Did not respond
		112	97	148	102	77		69
%		21	18	28	19	14	Mean = 2.9	

Does not provide opportunity to socialize with peers



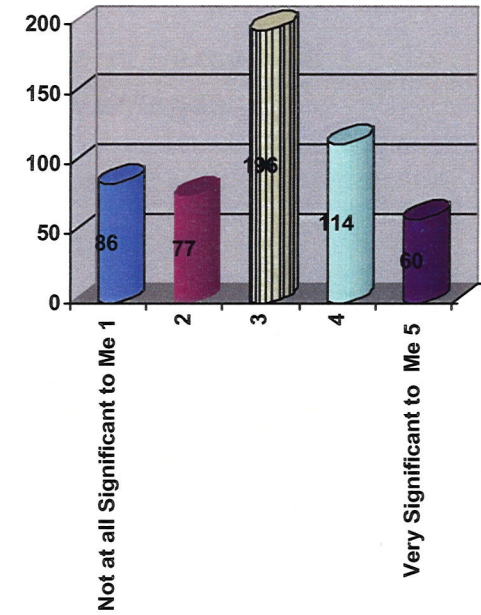
Question 7.5	Lack the structure or guidance required for me to learn							
	N = 534							
Answers	Not at all significant to me	1	2	3	4	5	Very significant to me	Did not respond
		88	118	166	100	62		71
%		16	22	31	19	12	Mean = 2.9	

Lacks Structure and Guidance



Question 7.6	Technical challenges (use of new equipment and software) associated with Distance Learning							
	N = 533							
Answers	Not at all significant to me	1	2	3	4	5	Very significant to me	Did not respond
		86	77	196	114	60		72
%		16	14	37	21	11	Mean = 3.0	

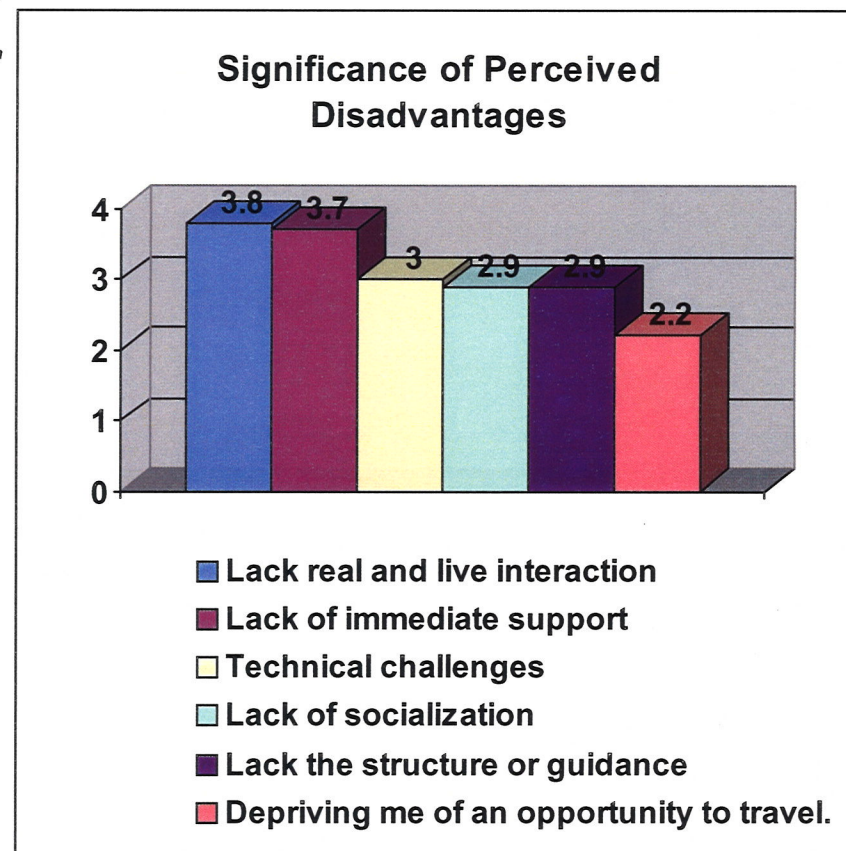
Lacks the Immediate Support from Instructor



4.11 Data Summary for Perceived Disadvantages of DL

As depicted in Summary Graph 7, the arithmetic Mean for the perceived disadvantages where "1" is not at all significant to me and "5" is very significant to me are presented below from highest to lowest:

- (1) 3.8 - Lack real and live interaction with my instructor(s) and other students;
- (2) 3.7 - Lack of immediate support required form instructor(s);
- (3) 3.0 - Technical challenges (use of new equipment and software) associated with Distance Learning
- (4) 2.9 - Lack of socialization with my peers;
- (5) 2.9 - Lack the structure or guidance required for me to learn; and
- (6) 2.2 - Depriving me of an opportunity to travel.



Summary Graph 7

4.12 Itemized Data for Willingness to Participate to DL

Part 8 of the questionnaire was aimed at verifying the respondents desire to engage in a DL programme for:

- (4) Educational upgrade purposes;
- (5) Professional development purposes; and
- (6) Advanced Military Occupation (MOC) Training.

Part 8	Will to participate in Distance Learning		
Question 8.1	Would you willingly participate in distance learning for educational upgrade purposes, if the proposed programmes were as effective as traditional face-to-face instructor-led instruction?		
N = 533			
Answers	Yes	No	Did Not Answer
#	463	70	72
%	87	13	

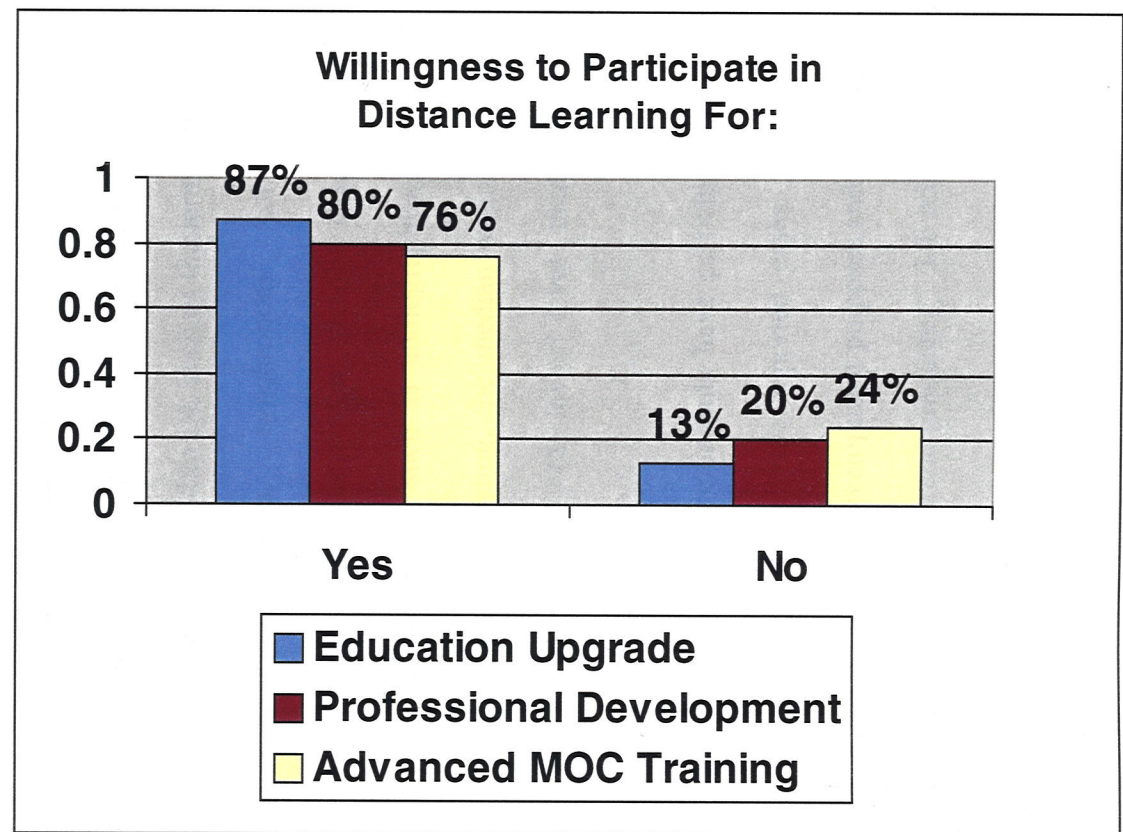
Question 8.2	Would you willingly participate in distance learning for professional development purposes (BAOC, AAOC, JLC, SLC), if the proposed programmes were as effective as traditional face-to-face instructor-led instruction?		
N = 535			
Answers	Yes	No	Did Not Answer
#	429	106	70
%	80	20	

Question 8.3	Would you willingly participate in distance learning for advanced MOC training purposes, if the proposed programmes were mainly knowledge based and were as effective as traditional face-to-face instructor-led instruction?		
N = 525			
Answers	Yes	No	Did Not Answer
#	397	128	80
%	76	24	

4.13 Data Summary for Willingness to Participate of DL

In terms of percentage, Summary Graph 8, shows that respondents are disposed to participate in DL for the following learning activities:

- (1) 87% -- Educational Upgrade;
- (2) 80% -- Professional Development; and
- (3) 76% -- Advanced MOC Training.



Summary Graph 8

Chapter V

Summary, Discussion, Conclusions and Recommendations

The purpose of this final chapter is first, to provide a summary of the findings. Second, areas of significant interest will be analysed discussed and further analysis of the data will be presented. Next, the significance of the study will be submitted. Fourth, the overall conclusion of the study will be formulated. Recommendations will then be enunciated, and, finally, further research will be suggested.

5.1 Summary of the Findings

The intend of this study was to define the level of knowledge, experiences and perceptions of potential DL learners in the CAF in the December 2000 period. The data collected supports the following findings:

- (1) The median respondent has a perceived “Basic” knowledge of the major concepts related to DL such as the terms: distance learning, asynchronous communication, synchronous communication and paper-based programmed instruction. In the case of specific technologies and/or methodologies such as audiographics, web-based training and desktop video conferencing, the median respondent indicated that he/she had a “Rudimentary” (a lower level than “Basic”) knowledge of these technologies;
- (2) 38% of the respondents have participated in a DL program other than OPDP. Of all the reported cases, 39% of DL programs were for professional development purposes and 37% were for educational upgrade (undergraduate and graduate). Job related qualifications (CF or civilian)

fulfilled through DL came in last with 24%. When it comes to respondents access, 69% of the cases were learning/studying the courseware from their home, 15% accessed the courseware from their office, 8% from a CF learning centre and 8% from other locations.

54% of the reported cases participated in one-way DL, two-way asynchronous DL was indicated in 36% of the cases, while 10% of the cases were reported as two-way synchronous DL. With regard to the methodologies and technologies used to participate in DL, paper based instruction was used 54% of time followed by CBT with 16%, WBT with 13%, audio technologies 11% and video/TV with 7%;

- (3) The Median respondent has indicated that he/she agrees that DL can be as conducive for the following 10 of the 22 attributes as face-to-face instruction. The respondents either agreed or strongly agreed in the respective percentage terms for the following attributes:

- (a) 80% - Posting of course schedules;
- (b) 73% - Access to training plan/training standard;
- (c) 69% - Availability of reference material;
- (d) 68% - Reliable testing;
- (e) 68% - Course critique program;
- (f) 65% - Valid testing;
- (g) 62% - Sequencing of lessons;
- (h) 53% - Provision of a sufficient number of qualified instructor;

- (i) 51% - Summative evaluation; and
 - (j) 50% - Entry level testing.
- (4) The Median respondent indicated that he/she disagrees that DL can be as conducive for the following 12 of the 22 attributes as face-to-face instruction. The respondents either disagreed or strongly disagreed in the respective percentage terms for the following attributes:
- (a) 82% -Counselling and tutoring;
 - (b) 79% - Active participation of course members;
 - (c) 74% - Effective demonstrations;
 - (d) 70% - Remedial instruction;
 - (e) 69% - Effective explanations;
 - (f) 65% - Supervision of Instructors;
 - (g) 63% - Use of sound instructional methods;
 - (h) 62% - Formative evaluation;
 - (i) 59% - Use of training aids;
 - (j) 58% - Provision of effective feedback on tests results;
 - (k) 54% - Use of learning aids; and
 - (l) 53% - Presentation of lesson objectives.
- (5) The arithmetic mean of the importance of perceived DL benefits where "1" is not at all important to me and "5" is very important to me are presented below from highest to lowest:
- (a) 3.6 - Geographical independence;
 - (b) 3.6 - Time independence;

- (c) 3.2 - Access to learning at min cost;
 - (d) 3.2 - Variety of media/resources;
 - (e) 2.7 - Reflect on ideas before feedback;
 - (f) 2.6 - Reflect before interacting; and
 - (g) 2.3 - Learning w/o socialization.
- (6) The arithmetic mean for the significance of perceived disadvantages where "1" is not at all significant to me and "5" is very significant to me are presented below from highest to lowest:
- (a) 3.8 - Lack real and live interaction with my instructor(s) and other students;
 - (b) 3.7 - Lack of immediate support required form instructor(s);
 - (c) 3.0 - Technical challenges (use of new equipment and software) associated with DL
 - (d) 2.9 - Lack of socialization with my peers;
 - (e) 2.9 - Lack the structure or guidance required for me to learn; and
 - (f) 2.2 - Depriving me of an opportunity to travel.
- (7) In terms of percentage, the results show that respondents are disposed to participate in DL for the following learning activities:
- (a) 87% -- Educational Upgrade;
 - (b) 80% -- Professional Development; and
 - (c) 76% -- Advanced MOC Training.

5.2 Analysis and Discussion

This section will be used to analyse and discuss the findings of the survey. Tentative explanations stemming from the analysis will be put forward.

5.2.1 Knowledge of DL Concepts and Technologies.

Respondents having a basic knowledge i.e., *the level of understanding of the definition and basic concept which enables the relating of this knowledge to the task at hand* for DL terminology is not unexpected. A large number of them have personally participated in DL programs through the OPDP and/or other institutions. They would then have had an opportunity to experience DL and some (or the lack of) communication strategies (one-way, two-way, asynchronous and synchronous). This would provide a frame of reference from which they could relate to terms associated with DL. In addition, the prominence of DL as a delivery mechanism for education and training is such that they are likely to have been in contact with someone engaging in DL activities. Lastly, publicity of DL programs is widely available in a variety of media e.g., most cable providers have at least one station that broadcasts undergraduate level courses such as University of Winnipeg in Manitoba or la Télé-Université in Québec.

On the knowledge of specific technologies, once again the results were somewhat predictable. Knowledge is closely related to experience. Since the majority of the respondents had experienced paper-based DL, their indication of possessing a “basic” knowledge of the technology is consistent with expectations. Conversely, the finding that the median respondent possess a “rudimentary” i.e., *An awareness of the basic definition and concept* (which is lower than a “basic” knowledge, see Section 3.1.3 Chapter III) can

be primarily explained by their lack of experience with the specific technologies which will be further discussed in the next section.

5.2.2 Experiences with DL

When considering that close to 4 out of 10 respondents have participated in DL programs other than OPDP, one must come to the realization that DL is no more a marginal delivery methodology for CAF personnel. The requirements of the recent “Degree Officer Program” which now requires all Canadian Forces Officers to hold a minimum of a bachelor degree and other incentives for Non Commission Members to upgrade their education coupled with the myriad of DL programs offered at the Royal Military College and other Degree Granting Institutions offers some explanations for this statistic. This reality also provides some insight into the finding that a combined 76% of the reported DL activities are for educational upgrade and professional development. On the other hand, in addition to the CAF offering a limited number of DL courses, the finding pertaining to job related qualifications (training) accounting for only 24% of the reported DL activities may be explained by the fact that several CAF training programs are composed of highly technical content relying on the use of fairly sophisticated equipment.

When it came to access, the 69% of the cases who studied from their home against 15% from their office and 8% from a CF learning center can be interpreted based on two major factors: infrastructure and policy. From the infrastructure point of view, the CAF does not have standard, visible and recognized learning centre facilities in each of its thirteen Wings. Some Wings, through local initiatives have instituted such facilities but their role, configuration and accessibility vary from place to place and may not be

known by most CAF members. CAF personnel, therefore, studied DL programs elsewhere namely at home, given that the office is rarely conducive to individual learning.

54% of the DL cases reported were “one-way” DL. Given that such a large number of the respondents reported their DL participation as being of the “correspondence type”, one should not be surprised to find that the median respondent does not think that DL measures up to face-to-face instruction in areas of instructional delivery, class participation, and overall learner support. This issue will be further discussed in the next section. Asynchronous delivery and/or support accounted for approximately one-third of the cases with the majority of the cases (65%) being paper based. This, again, would suggest that communication strategies are for the most part extrinsic to the instructional delivery and are not a core part the overall strategy at least not to the point where students would feel a sufficient amount of peer to peer and/or instructor support. This finding, again, confirms the sentiment that when participating in DL activities, learners are often left to themselves with limited immediate access to peers and instructors. Once more, this situation provides insight into the finding of the next section as to the belief that DL does not measure up to face-to-face instruction in some core instructional activities. Finally, asynchronous WBT and other synchronous methodologies which typically incorporate student to student and student to instructor communication as a core instructional strategy represented 14% of the cases reported. This type of DL experience was limited for CAF members at the time this research was conducted and does once more shed some light into the responses collected in the DL Vs face-to-face instruction of the survey.

5.2.3 Perceived Effectiveness of DL Vs Face-to-face Instruction

As indicated above, the intent of this section of the questionnaire was to determine if respondents perceived DL to be as effective as face-to-face instruction. Although no significant problems were revealed during the pre-testing of the questionnaire, it was later observed (shortly prior to the dissemination of the instrument) upon careful examination of the items, that there may be a problem with interpreting the results given the structure of the questions.

I believe DL can be as conducive to
the active participation of course members
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

Table 5

Given Table 5 (above), it was submitted that should a respondent disagree or strongly disagree with a statement, one would not know if the respondent believed that DL was better or worst than face-to-face instruction. Although technically correct, this situation did not pose any problems to the vast majority of the respondents during the actual conduct of the survey as only a few raised questions about the formulation of the items in this section of the questionnaire. Later discussions with potential respondents lead the researcher to conclude that the participants had correctly interpreted the items. Consequently, disagreement or strong disagreement with the statement made in each of the items were taken as the belief that DL does not lend itself to a particular attribute as well as face-to-face instruction.

Let us then examine the cases where respondents indicated that they agreed or strongly agreed to the statements. When trying to ascertain a trend, we can propose that most of the items with a combined score 50% or more for "agree" or "strongly agree" were administrative in nature or non-core instructional functions. Some examples are: posting of course schedule, availability of reference material and training plan/standards, course critique program, etc. Some noted exceptions were in the area of assessment with items such of reliable and valid testing, summative evaluation as well as proper sequencing of lessons.

At the other end of the spectrum, most of the items with a combined score 50% or more "strongly disagree" or for "disagree" could be labelled as the foundation of instructional technique in a face-to-face instructor-led paradigm. They are attributes that would come to mind for most professionals and laymen alike if they were asked to identify key indicators for a successful training or education program. Specifically, respondents seemed concerned with instructor and peer immediacy. Items such as counselling and tutoring, active participation, effective demonstrations, remedial instruction, formative evaluation, effective feedback, etc fell into this category. As noted in the previous section, given the nature of the majority of the respondent's experience being one-way or two-way paper based DL, these findings are reasonable. Should the experience of the respondents have been different, with more interactive computer mediated communication strategies for example, the collected may have been different (Smith, Reiner, Jan 2000) and (Newlands, McLean, Oct 1996, p.1).

5.2.4 Perceived Benefits of DL

Findings in this area are consistent with some of the literature (McCormick, Jones, 1998 pp.19-22). They indicate that, for the most part, learners perceived DL particularly convenient in terms of geographical and temporal independence, access at minimal cost and access to a variety of media/resources. These benefits hold true for the majority of DL approaches with the exception of temporal independence for synchronous methodologies and variety of media/resources for paper-based programs. The advantages associated with asynchronous WBT, such as the ability to reflect on the material presented or posting by other students before interacting and the ability to concentrate on the learning without socialization, were deemed less important to the respondents. These results are congruent with the inexperience of most respondents with two-way asynchronous DL methodologies such as the web-based learning environment.

5.2.5 Perceived Disadvantages of DL

Respondents identified peer and instructor immediacy as the most significant disadvantages of DL. Given the nature of the reported DL experiences discussed in previous sections, which were mainly one-way paper based and two-way asynchronous paper-based, the fear of isolation would reasonably come up as very significant concern to them. Next is the issue of technological problems associated with DL. This issue was perceived as neutral from the respondents point of view. Once more, the preponderance of paper based approaches can explain some of these results. In addition, the CAF has successfully used training technology in support of face-to-face training for the last 30 years. This may explain the attitude of the respondents towards new technology. The lack of structure sometimes associated with asynchronous web-based instruction did not appear to be a significant issue to the respondents. The lack of socialization, and the

missed travel opportunity, (the fringe benefits associated with corporate training and education) were not very significant to respondents. One can presume that from a quality of life perspective, respondents may value the opportunity to stay close to their families more than these two privileges.

5.2.6 Willingness to Participate in DL

Based on the findings discussed in section 5.2.3 and 5.2.5, one would have expected the willingness of respondents to participate in DL to be at lower levels than the reported findings. It is, therefore, unexpected to find more than 80% of the respondents willing to engage in DL programs for education and training purposes. A possible rationale for these findings is that in the overall considerations for their willingness, respondents attributed more weight to the perceived benefits of DL than to the perceived disadvantages. In addition, one may argue that although a majority of respondents indicated that DL was not as effective as face-to-face for several core instructional activities, they believed that DL is “good enough” to obtain acceptable results.

5.3 Conclusions

The data collected in this survey supports the following conclusions:

- (1) CAF learners perceive to possess a sufficient amount of knowledge to grasp the basic concepts of DL. They are, however, less familiar with the specific leading technologies currently in use in the field of DL. This may be a result of their limited personal experience with DL.
- (2) CAF learner are primarily centered around one-way paper based instruction, with distributed CBT and WBT distant second and third. CAF personnel are mostly engaged in DL for educational upgrade and

professional development purposes. CF qualifications obtained through DL accounted for only a quarter of the reported cases. The vast majority of the learners are accessing the programs from their home.

- (3) CAF personnel believe that DL can be as effective as face-to-face instruction for non-core instructional functions. When it comes to core instructional functions, they believed face-to-face instruction to be more effective.
- (4) Respondents value the unique benefits of DL such as geographical, temporal independence and the variety of media/resources used in the provision of DL.
- (5) Participants perceive the lack of peer and instructor immediacy and support as the most significant disadvantage of DL.
- (6) Finally, the vast majority of respondents were willing to participate in DL for educational, professional development and advance MOC training purposes.

5.4 Significance of the Study

Prior to this study, there were no available data on CAF personnel knowledge, experiences and perceptions of the emerging field of DL. From an organizational point of view, the findings emanating from this research provides meaningful information about the most important stakeholder in the DL enterprise, the learner. We now have a portrait of potential CAF Distance Learners, and are more familiar with their representation of the DL concept, previous experiences and how they have shaped their perception of the DL reality. This information should be viewed as a critical

underpinning for the development of judicious policy, strategic guidance and DL infrastructure. In addition, it can provide a basis from which specific CAF DL communication and marketing strategies may be developed and implemented. Instructional designers may wish to base some of their decisions on the findings of this research to articulate and implement training and education programs for the CAF. It should also serve as an indicator for essential DL courseware features required to address the concerns of the majority of the respondents. Lastly, the research may serve as a basis to build on the identified willingness of the population to engage in DL activities and push decision makers to offer more DL programs to CAF Personnel.

5.5 Recommendations

By conducting this study, the CAF has initiated a dialogue with its learner community. The next step in this process will be to internally publish the results of this research. The CAF leadership needs to discuss the findings, build on what is perceived as the positive aspects concluded from the study, and indicate how they intend to address the concerns of the respondents. The apprehension of the respondents towards DL are real, but can be overcome with proper instructional design and the use of current, more interactive technologies. Therefore, information must be provided to CAF personnel about the opportunities, challenges, various methodologies and technologies available today to conduct effective DL. Emphasis should be placed on highlighting the potential of collaborative tools available for DL. Learners must also be reassured that DL will not replace traditional instruction in areas where "hands on training" is required.

The information can be communicated in a variety of media such as brochures, video or a web site dedicated to DL in the CAF.

The CAF must be careful to select the right qualifications (courses) for conversion to DL. It must, first of all, ensure that courses with appropriate content are selected, i.e., primarily knowledge-based or with an objective of developing cognitive skills.

Education programs, professional development and some advanced MOC training are ideal candidates. The target population must also be carefully studied and meet minimum education, motivation and autonomy levels.

To address the specific concern of peer and instructor immediacy, DL projects in the CAF must move away from the correspondence model of "fire and forget". Courseware must be designed with peer to peer interaction and learner support in mind. The use of asynchronous and synchronous computer mediated communication to provide learner orientation, course/module introduction, team collaboration, exploration, construction of meaning, critical analysis and tutoring must be a central proposition of CAF DL programs.

One of the first steps, however, is for the CAF to produce strategic guidance and an infrastructure framework that will facilitate the identification, design, development, conduct and evaluation of effective DL programs for the Air Force. This framework must have the learner as the overriding preoccupation.

5.6 Suggestions for Further Research

The pre-determined scope of this study was to remain within the "descriptive research" parameters. There may be great insight that could be drawn from qualitative research conducted as a follow-up to this study. In addition, given the nature of the collected data, there is potential for correlational research that could establish whether, and to what degree, previous DL experience influence perceptions of distance learners.

It would also be useful to conduct similar research using other environmental commands, i.e., the Navy and the Army as a target population in order to determine if similar or different findings would be derived. Equivalent research could also be conducted with foreign/allied military such as the United Kingdom or Australia. This study could also be replicated within an other federal department or a large Canadian corporation to see if there are significant difference between these population and the CAF.

Finally, this study was delimited to one particular stakeholder in the DL system, the learner. Research within the CAF should now focus on other key players such as command executives, school commandants, instructional designers and instructors.

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Appendix 1

Part 1 – Biographical Data

Please provide the following biographical data.

1.1 Indicate the highest level of completed education.

- High School
- Some College
- Undergraduate Degree
- Some Graduate School
- Graduate Degree

Part 2 – Knowledge of DL

The following terminology is employed in defining characteristics of DL programs. Using the scale defined below, please indicate your level of knowledge of each of these terms.

No Knowledge	Never heard or read, anything regarding this concept.
Rudimentary	An awareness of the basic definition and concept.
Basic	The level of understanding of the definition and basic concept which enables the relating of this knowledge to the task at hand.
Detailed	The level of understanding of theory and principles of a topic or body of knowledge that is usually gained through formal training and/or experience .

2.1 Distance Learning

- No Knowledge
- Rudimentary
- Basic
- Detailed

2.2 Asynchronous Communications (A mode of communication such as voice-mail, e-mail and newsgroups that enables non-real-time (time delayed) exchange of information between two or more individuals.)

- No Knowledge
- Rudimentary
- Basic
- Detailed

2.3 Synchronous Communications (A mode of communication that enables live, real time exchange of information between two or more individuals.)

- No Knowledge
- Rudimentary
- Basic
- Detailed

2.4 Paper Based Programmed Instruction

- No Knowledge
- Rudimentary
- Basic
- Detailed

2.5 Audiographics

- No Knowledge
- Rudimentary
- Basic
- Detailed

2.6 Web Based Training

- No Knowledge
- Rudimentary
- Basic
- Detailed

2.7 Desktop videoconferencing

- No Knowledge
- Rudimentary
- Basic
- Detailed

Part 3 – Experience with DL

3.1 Other than OPDP, have you participated in a DL program in the past? (where there is a physical separation of the student and instructor)

- Yes
- No

3.2 If you answered Yes to question 9, which of the following best describes the requirement for that training program (choose one or more as appropriate)

- An existing CF qualification required for my job
- A civilian qualification required for my Job
- Professional Development
- Undergraduate Educational Upgrade
- Graduate Educational Upgrade

3.3 If you answered Yes to question 9, which of the following best describes the setting for that training program (choose one or more as appropriate)

- I accessed the program/studied from my office at the workplace
- I accessed the program/studied from a CF learning centre
- I accessed the program/studied from my home
- Other

3.4 If you answered Yes to question 9, please indicate what kind of program(s) you were involved in. Select one or more as applicable.

- I did not participate in one way DL
- One way – Paper Based
- One way – Audiotape
- One way – Videotape
- One way – Radio Broadcast
- One way – Television Broadcast
- One way – Computer Based Training (CBT)
- One way – Web-Based Training

3.5 If you answered Yes to question 9, please indicate what kind of program(s) you were involved in. Select one or more as applicable.

- I did not participate in two way asynchronous (time delay) – DL
- Two way asynchronous (time delay) – Paper Based supplemented by phone, voice mail and/or e-mail
- Two way asynchronous (time delay) – Audiotape supplemented by phone, voice mail and/or e-mail
- Two way asynchronous (time delay) – Videotape supplemented by phone, voice mail and/or e-mail
- Two way asynchronous (time delay) – Radio Broadcast supplemented by phone, voice mail and/or e-mail
- Two way asynchronous (time delay) – Television Broadcast supplemented by phone, voice mail and/or e-mail
- Two way asynchronous (time delay) – CBT supplemented by phone, voice mail and/or e-mail
- Two way asynchronous (time delay) – Web-Based Training

3.6 If you answered Yes to question 9, please indicate what kind of program(s) you were involved in. Select one or more as applicable.

- I did not participate in two way synchronous (real time) – DL
- Two way synchronous (real time) – Phone, Audio-Conferencing
- Two way synchronous (real time) – Audiographics
- Two way synchronous (real time) – Video-Conferencing
- Two way synchronous (real time) – Desktop Video-Conferencing
- Two way synchronous (real time) – Web-Based Training

Part 4 – Comparative Effectiveness

The Canadian Forces Manual of Individual Training – Volume 11 provides training managers with a list of criteria against which they can measure the effectiveness and efficiency of the training they provide. These criteria can be viewed as attributes of a “good” training program.

In this part of the survey, you will be asked if you believe that DL, when compared to Face-to-face Instruction, can be produced with the same set of desirable attributes.

For each of the question, select the choice that corresponds with what you believe.

4.1 I believe DL can be as conducive to effective
entry level testing
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.2 I believe DL can be as conducive to
the logical sequencing of lessons within a course syllabus
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.3 I believe DL can be as conducive to
the presentation of learning objectives
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.4 I believe DL can be as conducive to
the use of sound instructional methods
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.5 I believe DL can be as conducive to
effective demonstrations
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.6 I believe DL can be as conducive to
effective explanations
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.7 I believe DL can be as conducive to
the active participation of course members
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.8 I believe DL can be as conducive to
the effective use of learning aids (student tools i.e., précis, checklist, flowchart, etc)
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.9 I believe DL can be as conducive to
the effective use of training aids (instructor tools i.e., whiteboard, slideshow, etc.)
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.10 I believe DL can be as conducive to
the availability of required reference material for course members
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.11 I believe DL can be as conducive to
the provision of an appropriate number of qualified instructors
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.12 I believe DL can be as conducive to
the supervision of instructional staff
as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

- 4.13 I believe DL can be as conducive to **the posting of course schedules** as face-to-face instruction.
- strongly disagree
 - disagree
 - agree
 - strongly agree
- 4.14 I believe DL can be as conducive to **students having access to the training standard and training plan** as face-to-face instruction.
- strongly disagree
 - disagree
 - agree
 - strongly agree
- 4.15 I believe DL can be as conducive to **the conduct of formative evaluation (i.e., diagnostic and ongoing)** as face-to-face instruction.
- strongly disagree
 - disagree
 - agree
 - strongly agree
- 4.16 I believe DL can be as conducive to **the conduct of summative evaluation (i.e., final and for certification purposes)** as face-to-face instruction.
- strongly disagree
 - disagree
 - agree
 - strongly agree
- 4.17 I believe DL can be as conducive to **the administration of valid (measure what they suppose to measure) tests** as face-to-face instruction.
- strongly disagree
 - disagree
 - agree
 - strongly agree
- 4.18 I believe DL can be as conducive to **the administration of reliable (constant from time to time and student to student) tests** as face-to-face instruction.
- strongly disagree
 - disagree
 - agree
 - strongly agree

4.19 I believe DL can be as conducive to **the communication of effective feedback on test results** as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.20 I believe DL can be as conducive to **effective counselling/tutoring** as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.21 I believe DL can be as conducive to **the provision of effective remedial instruction** as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

4.22 I believe DL can be as conducive to **an effective course critique program** as face-to-face instruction.

- strongly disagree
- disagree
- agree
- strongly agree

Part 5 – Perceived Benefits of DL

Using a DL methodology with the appropriate mix of synchronous (same time, different place) and asynchronous (different time, different place) communication to deliver training and education real/perceived benefits. In the next part of this survey, you are asked to **indicate how you view the importance of these issues.**

5.1 Geographical independence. I can undergo training or upgrade my education without being away from home for an extended period of time	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me
5.2 Time Independence. I can undergo training or upgrade my education at my own pace, managing my time in a way that best suits my study habits.	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me
5.3 Gives me access to learning opportunities at minimal cost.	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me
5.4 Gives me access to a variety of media and resources to enhance my learning experience.	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me
5.5 Lets me focus on the learning experience without the unnecessary socialization.	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me
5.6 Allows me to reflect on my own about the material to be learned before I interact with others.	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me
5.7 Allows me to reflect about other people's idea before providing feedback.	Not at all Important to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very Important to me

Part 6 – Perceived Disadvantages of DL

Using a DL methodology to deliver training and education comes with real/perceived disadvantages. In the next part of this survey, you are asked to indicate if the following issues are **significant enough to discourage you from engaging in a DL program**.

6.1 Depriving me of an opportunity to travel	Not at all significant to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very significant to me
6.2 Lack real and live interaction with my instructor(s) and other students	Not at all significant to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very significant to me
6.3 Lack of immediate support required from instructor(s)	Not at all significant to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very significant to me
6.4 Lack of socialization with my peers	Not at all significant to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very significant to me
6.5 Lack the structure or guidance required for me to learn	Not at all significant to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very significant to me
6.6 Technical challenges (use of new equipment and software) associated with DL	Not at all significant to me	1 2 3 4 5 ○ ○ ○ ○ ○	Very significant to me

Part 7 – Will to participate in DL

7.1 Would you willingly participate in DL for **educational upgrade** purposes, if the proposed programs were as effective as traditional face-to-face instructor-led instruction?

- Yes
 No

7.2 Would you willingly participate in DL for **professional development** purposes (BAOC, AAOC, JLC, SLC), if the proposed programs were as effective as traditional face-to-face instructor-led instruction?

- Yes
 No

7.3 Would you willingly participate in DL for **advanced MOC training** purposes, if the proposed programs were **mainly knowledge based** and were as effective as traditional face-to-face instructor-led instruction?

- Yes
 No

Appendix 2

4500 -1(CFANS TDO)

Dec 2000

Respondent

SURVEY ON AIR FORCE OFFICERS PERCEPTIONS AND ATTITUDES TOWARDS DL

1. The CAF is considering the conversion of some existing qualifications to DL (DL) as one of the component of its overall training system. Foreign militaries, large multinational corporations and academic institutions have successfully used DL methodologies to deliver learning activities anywhere, anytime, through modularized, standardized instruction, to the right people, at a competitive cost.
2. Under the sponsorship of Director General of Air Personnel, Brigadier-General B.G Johnson, the undersigned his conducting a survey as a partial fulfilment for a Master of Education at the University of Manitoba. This research is conducted under the supervision of Professor James C. Welsh, PhD; he can be reached at (204) 474-9072. The purpose of this study is to produce a snapshot of CAF personnel perceptions and attitudes with regard to DL . Specifically, the study shall explore the following research questions:
 - a. What is the level of knowledge and experience of CAF learners with regard to the DL concept;
 - b. What are the perceptions of potential CAF distance learners with regard to the effectiveness of DL when compared to face-to-face instruction;
 - c. What are the predominant learning styles of potential CAF distance learners;
 - d. What are the perceived benefits and disadvantages of DL form the CAF learner's point of view; and
 - e. Would CAF learners willingly participate in DL programs?
3. The sampling methodology for this survey is based on the random selection of a sufficient amount of units, to survey approximately 1500 respondents. Your unit has been randomly selected as one of these units. Your participation to the survey is voluntary. You may choose not to participate to this study without prejudice or consequences. Completion of the on-line survey will be interpreted as voluntary and informed consent.
4. The survey can be accessed on the Defence Information Network (DIN) by "clicking" on the following hyperlink: <http://131.139.119.177/survey/index.htm>. Respondents can also insert quote <http://131.139.119.177/survey/index.htm> unquote in the address or location block of their specific browser and press "enter" on their keyboard. Respondents are requested to provide their service number and follow the directions provided on-line. The estimated time of completion for the survey is 30 minutes. Respondents are requested to provide their input by 22 Dec 00 COB.

5. The information collected will be treated as confidential. Information linking subjects to specific data will not be made available under any circumstances to any personnel other than the undersigned. Upon completion of the survey period, the Service Number and Surname field of the "respondent" database table will be deleted making it impossible to link data to specific subjects.
6. Results will be published in a way that no individual results can be traced. Findings, conclusions and recommendations from this study will be available on-line at the CAS PG &T Defence Information Network web site in February 2001. Questions regarding the completion of this survey can be directed to Capt D. Forest, AVN 257-5552.
7. Should you have ethical related concerns or questions regarding your participation in this research, please contact Margaret Bowman at the University of Manitoba Human Ethics Secretariat at (204) 474-7122

D. R. Forest
Captain
Training Development Officer
CF Air Navigation School

Appendix 3

List of Clusters	No of Personnel
400 TAC HE	227
402 SQN	301
403 HEL OT	244
404 (MP&T)	123
405 (MP) S	118
407 (MP) S	301
408 TAC HE	360
410 TAC F	226
412 (T) SQ	41
415 (MP) S	108
416 TAC F	222
417 CS SQN	67
42 RADAR S	39
420 COMPOS	50
423 (MH) S	217
424 T&R	151
425 TAC FT	227
426 (T) TR	123
427 TAC HE	303
429 (T) SQ	98
430 TAC HE	272
431 (AD) S	28
433 TAC FT	226
434 CS SQN	216
435 T & R	282
436 (T) SQ	98
437 (T) SQ	83
438 ETAC	246
439 CS SQN	58
440(T&R) S	41
442 (T&R)	240
443 (MH) S	260
444 CS SQN	41
HT 406	84

Statistics of all AF clusters

Total No of Personnel	5775
Mean No of Personnel per Cluster	170
Median No of Personnel per Cluster	184
StdDev	99

Sampling Methodology

For approx. 6000	361	Is No of required respondents for overall population
	762	Double (safety precaution)
If 50% Returns, need:	1444	Number of Clusters required
	9.0	

Randomly Selected Clusters

Randomly Selected Clusters	# of Personnel
423 (MH) S	217
426 (T) TR	123
429 (T) SQ	98
410 TAC F	226
431 (AD) S	28
440(T&R) S	41
443 (MH) S	260
434 CS SQN	216
407 (MP) S	301
403 HEL OT	244