SEARCHING FOR EFFICIENCIES AND EFFECTIVENESS IN NAVAL OFFICER TRAINING

By

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CHAPTER ONE

INTRODUCTION

Background

Until recently an upward spiralling deficit, a large national debt, inflation and a strong call by the people of Canada to strengthen the social safety net required the Liberal Government to re-direct funds away from the Department of National Defence (DND). As presented in DND Minister's report responding to fiscal realities of the last decade he stated, " By 1998/99, the Defence budget will have been reduced by a full 23%, to $9.2 billion from over $12 billion in 1994" (DND, 1999a).

In order to maintain the necessary level of operational proficiency DND sought savings through the reduction in Capital Procurement and by reducing the number of members in the department. Capital procurement expenditures shrank from 25% of the annual Defence budget to the current level of 15.4% (DND, 1998a). Analysts have determined that given the current level of Capital Procurement, which includes replacement of existing ageing equipment, the military will not be able to keep up with the rate of obsolescence and "rust out" of military inventory (DND, 1999b). This challenge will have a direct impact on the operational readiness of the Canadian Forces (CF) in the future and creates a bow wave of obsolescence that becomes more difficult to address as time progresses.

The reduction of personnel in DND was accomplished through natural attrition, supported by a hiring freeze, and by implementing a program that would entice personnel to retire early. The first "Golden Handshake" initiative, titled Force Reduction Programme (FRP) was initiated in 1994. This program was targeted at both the uniformed and civilian population of the defence department. The FRP programmes in conjunction with normal attrition associated with retirement and personnel seeking career changes saw the CF reduce in numbers from 66,700 in 1994 to its current level of 60,000 (DND, 1995b). One un-forecasted consequence of the FRP programmes was that more military personnel opted for the retirement package than originally estimated. This has

led to increased pressure on the training organisations to produce more trained personnel even though these institutions' budgets and access to resources were also reduced.

Operational missions for the navy has increased significantly over the last 10 years. Ships participating in interdiction operations in the Persian Gulf and the waters off former Yugoslavia, hurricane relief to the state of Florida, assistance to United Nations (UN) operations off Somalia and East Timor serve as examples of the variety and dispersed locations Canada's fleet has and is currently serving. These ships are deployed for periods on an average of six months and are fully manned and combat capable. The reduction in the number of trained and experienced personnel in the navy, brought on by the FRP initiative, has had a negative impact on sailors employed on operational missions on board ships.

The reduction in the number of trained personnel means that sailors are not rotated out of the ships to the less stressful shore positions as detailed in the sea/shore ratio plan. This has had a significant impact on the Quality of Life (QOL) of naval personnel and their families and has caused officers and non-commissioned members to seek career opportunities outside the CF. This continued reduction in personnel has created a downward human resource spiral, where sailors remaining in the navy are required to remain longer in ships therefore further aggravating the QOL issue.

The naval officer profession has not been spared the effects of the FRP and budget reductions. There is pressure to increase training throughput to meet the current Maritime Service (MARS) officer demands of the fleet and to make up the estimated 75 MARS officer shortage. This pressure comes in the midst of stagnant budgets, reduced fleet resources and an ever-increasing curriculum.

The initial training of Canada's naval officers is conducted at the Naval Officers Training Centre (NOTC), at Victoria, B.C. Basic MARS officer training depends heavily on the ships in the Fleet for support. The reduction of the availability of fleet resources started with the decommissioning of nine ships, four destroyers and five patrol boats,

which were primarily dedicated to personnel training. This was followed by the unavailability of remaining fleet resources due to the increase in the operational tempo. These developments have forced training establishments to use other means, such as simulation and emulation, to achieve training objectives.

While the training advantages and technical limitations associated with using these methods are understood, the loss of the experienced personnel that served in the now decommissioned ships who provided training and mentoring at sea is only now becoming apparent. A naval officer under training who used to have the guidance of a seasoned ship's Captain and ship's team, must now rely on the comparatively limited experience of junior Lieutenant instructors in a simulated sea environment. With the given reduction in traditional fleet resources and the introduction of emerging technology in training naval officers it is necessary to determine the efficiency of the current training methods employed at NOTC.

Defining Efficiency

The Concise Oxford Dictionary defines efficiency as, "state or quality of being efficient." Efficient is defined as, "productive of effect: competent, capable." The Canadian Forces Manual of Individual Training and Education Volume 8 defines efficiency as, "only the essential components are learned, and only by those who need to learn them" (DND, 1998c, Part 1, p. 2). This definition focuses on the what and who of training in the Canadian Forces and does not address efficiency factors relating to the development, delivery and administration of training which is the focus of this paper. The definition provided in Terrence Jackson's book, EVALUATION: Relating Training to Business Performance defines efficiency as, "...providing the same service with less outlay or resources" (Jackson, 1995). This definition captures what is becoming increasingly more important in the Canadian Forces, the cost of providing a service.

Efficiency is more than providing the most effective training. There are many aspects to the equation that measures the degrees of efficiency of an endeavour or in the

case of this paper the training provided to naval officers. Being efficient is more than adopting new training methods or purchasing the latest technology to deliver courses. The cost and return on investment are important factors in determining what is the most efficient way to conduct business. Efficiency is the result of all these efforts and more (Cherry, 1996; Thurlow et al., 1999; Montague and Knirk, 1998).

The measure of efficiency in the development of training, whether in the military or in industry, focuses on achieving the best outcome possible given all the influences and conditions imposed upon it by organisations and society. Charles Reigeluth in his book, Instructional-Design Theories and Models provides an interesting view of what efficiency focus is on in instructional design theory.

> This has to do with "bang for the buck," which includes two elements: a measure of the "bang" (effectiveness) and a measure of the "buck" (costs, either in money or time, or some other cost, or combination of costs). ... we must consider human time, effort, and energy required, as well as the cost of further resources needed, such as materials, equipment, or other requirements of the setting needed for instruction. (Reigeluth, 1999, p. 635).

Efficiency is the outcome or product of all components that determine the optimum structure of a course. Before a course or method of training undergoes change an analysis of all related factors must be considered. Factors such as time, effectiveness, learning styles, costs, cost/effectiveness analyses are elements of this equation. It is therefore the intention of this paper is to focus on the "bang for the buck" definition for efficiency.

Canadian Maritime Service (MARS) Officer Training

The current NOTC curriculum for training MARS officers is under constant review and validation. The standard to which MARS officers are trained is dictated by

the Chief of the Maritime Staff (CMS) on advice received by his Curriculum Control Authority (CCA). CCA for MARS officer training is the Commanding Officer of the Naval Officers Training Centre. The current standard is one that has evolved over 80+ years of experience and has been proven to be somewhat effective. The current schedule for basic MARS officer training is detailed in the following paragraphs and by the MARS training progression charts provided at Appendix A.

The basic training package instructed at NOTC is 37 weeks in duration. This training guides the MARS officer to the first level of training proficiency, Certificate of Competency Level I, (C of C I), allowing him/her to be a fully functional member of a ship's team. The 37 weeks of training are broken down into three phases:

a. MARS Phase II;
b. MARS Phase III; and,
c. MARS Phase IV.

The MARS II course, seven weeks in duration, is designed to introduce the trainee to the naval community. This phase focuses on naval customs and traditions, naval history, basic seamanship, leadership, life at sea, Maritime Command structure, and damage control and fire fighting.

MARS III builds upon the foundation laid during MARS II by providing courses in navigation, engineering, anti-collision regulations, multi-ship manoeuvring, tides and currents, at sea emergencies, and communications. In addition, five weeks are spent in the Navigation and Bridge Simulator (NABS) and three weeks at sea for the purpose of gaining practical experience and performance evaluation. This 16 week training period is considered by most learners to be the most intense phase of their naval training primarily due to the unfamiliarity of the subject matter.

The final phase, MARS IV, provides the learners with more detailed instruction on the material presented in MARS III. The phase is divided into six weeks of classroom

instruction, two weeks of practice in the NABS and six weeks at sea to consolidate their training and undergo the final assessment which leads to the successful completion of the basic MARS officer training. Students are awarded their C of C I on successful completion of MARS IV. Regular Force officers will then join their operational ship to further consolidate their training, learn new skills focused on war fighting operations and prepare to challenge the Certificate of Competency Level II Board, (C of C II), for major warships in 12 to 18 months. Naval Reserve officers normally remain at sea for four additional weeks on completion of the six week MARS IV phase to demonstrate a level of competency that would award them a Bridge Watch Keeping Ticket for minor warships.

Statement of the Problem

The lack of trained personnel and increased operational tempo has created a significant challenge for the leadership of the Canadian Navy. To meet the challenges of the future it is essential that NOTC train more naval officers therefore alleviating some of the pressure on existing serving officers. The challenge facing NOTC is threefold: how to effectively produce more trained naval officers, how to incorporate increases in curriculum without increasing the initial training period, and have to address the previous two issues without increasing the school's budget. This paper attempts to seek out efficiencies in basic MARS officer training that will contribute to identifying solutions and developing an overall plan to implement these solutions.

In order to sustain the number of officers in the navy it is estimated that NOTC must graduate 60 Regular Force naval officers a year. The school is averaging half that number. If the current demand persists then a production number of approximately 80 officers a year will be required for the next three years. Current instructional methods and allocation of resources prohibit NOTC from achieving these production quotas.

Research Questions

In order to focus the research the following questions were established.

1. What is adult learning? What are the different learning styles? How important are they in course development? What is the impact of motivation on adult learning? What are the factors that contribute to training effectiveness?

2. What are the alternate and emerging methods of training? What technology supports these different methods? Can they reduce training time? How effective are the new methods? How does an organisation implement new training methods? How does an organisation prepare instructors and students to maximise the benefits of new training methods?

3. What is the cost of the current officer training? What are the costs associated with implementing and maintaining new training methods?

Rationale for the Study

There are five major potential factors that could be influencing the efficiency of MARS officer training delivery at NOTC. These are:

1. Loss of traditional fleet resources for training.
2. Use of simulators for training and evaluation.
3. Training methods used to instruct.
4. Increase in material to be instructed.
5. Increased throughput requirement.

The reduction of fleet resources and the re-assigning priorities of ships to operational duties have had a direct impact on the accessibility of ships for training MARS officers. The amount of days at sea where the officer practices the art of navigation, the intricacies of fleet manoeuvres and ship-handling and managing a ship's bridge team have been drastically reduced, see Figure 1. This sea time has been replaced to a large extent with simulator time. While this allows the officers to learn and practice these skills, at a considerably reduced cost over traditional methods, there are limitations. These limitations manifest themselves around the inability of the student to experience

and interact with experienced ship's Captains, the routine associated with sea going life and working in the sometime hostile environment.

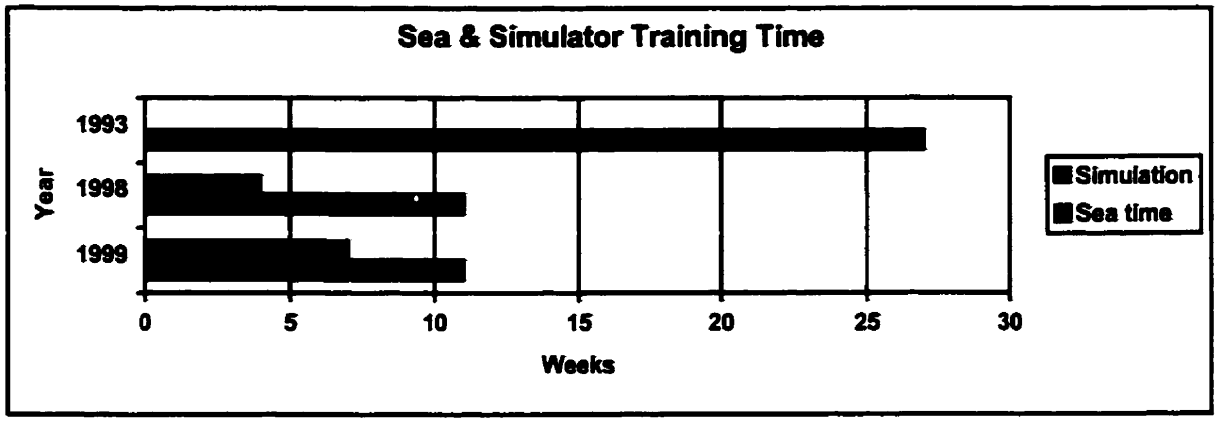

Figure 1.

Technology being introduced into NOTC is permitting officers at the school to access course lesson plans and material on their own time after classes. As well, the development and introduction of six rudimentary Web-based lessons provides the students an alternate method of learning to clarify or re-enforce a subject taught in the traditional classroom method. The positive benefits of providing alternate instructional methods both in effectiveness and time reduction to learn have been well-documented (Montague and Knirk, 1998; Trevor-Deutch, 1995). This was viewed as an avenue worthy of further investigation and development.

There are ever increasing demands on the naval officer-training curriculum to add course material. This material is being generated from agencies within DND but not involved with daily operations of the navy or naval officer development. Training targeted at educating DND personnel about harassment and prejudice, unit level discipline training program, and a renewed interest in enhancing pride within the navy have all been added recently to the training requirements. This increase in training coupled with the desire not to increase the time it takes to develop a naval officer necessitated the investigation into alternate methods of instruction.

Summary

The navy has to review how it trains naval officers for four reasons. The amount of resources (money, equipment, and people) has been reduced, the type of resources available to support training has changed, the amount of training has increased, and the time in which to develop naval officers has not changed. These challenges require all naval training establishments to review how training is conducted.

Efforts have to be expended in maximising the efficiencies of all training resources. Studies into ways to increase the effectiveness of new resources, like the Navigation and Bridge Simulator, are continuing. Alternate means of delivering training have been explored in this paper in order to increase delivery effectiveness and reduce training time.

It is understood that the development of naval officers is a process that is influenced by many agencies, directly and indirectly, associated with training. Areas such as recruiting, standards for selection, and pay and benefits are but a few that has an impact on the development of junior officers. While understanding these are influences that have some impact on naval officer development and QOL it is the author's intention to identify and develop efficiency solutions for those areas that are controlled by NOTC. The effectiveness or lack of effectiveness of those agencies that influence naval officers throughout their careers are excellent areas of study for future projects.

CHAPTER TWO

LITERATURE REVIEW

If you tell me, I will listen
If you show me, I will see
If you let me experience, I will learn
Lau Tzu

Introduction

This chapter presents an overview of the factors that influence efficiency as it relates to naval officer training. It will be divided into three main categories: what is learning and the factors that affect the learning process, what are the training methods and technologies available to enhance training effectiveness, and what are the cost factors to be considered when implementing and maintaining these improved training methods. From this literature review the researcher will be able to clearly demonstrate in subsequent chapters the current effectiveness of training at NOTC, where better efficiencies can be achieved.

The first area to be explored is related to the different theories and premises as to how people learn. This will be of particular interest as it relates to the processes required to convert information or data to knowledge. Does this learning process change as a person matures is of particular relevance given the age of the student population at the school? What are the different learning styles and how much consideration in course development should be expended catering to these differences? How much of an impact does motivation have on adult learning? Along with other theories the ARCS Motivation Model developed by John Keller will be examined to identify how to incorporate motivation into adult learning theory may influence future course design. The final topic to be addressed in this section will be the results of different qualitative research findings and how each can contribute to learning effectiveness.

The second section will present information on alternate and emerging training methods and technologies. Particular care was paid in detailing the strengths and weaknesses of the different methods and supporting technologies. As with the introduction of any new process it is important to identify the effects of introducing changes to the traditional training methods both on the student and the instructor. The identification of a selection process to aid in the marrying up of the right training method and technology with the different courses instructed at NOTC will complete this section.

The last section of the chapter will present the costs associated with the current method of training at NOTC. As well, cost concerns associated with the implementation of the different methods and technologies will be discussed.

By the end of this chapter the different aspects of learning will have been discussed, what new training methods and technologies are available to assist in gaining efficiency and the cost associated with bringing about these efficiencies.

Learning and Training

In order to properly assess current and alternate training methods it is important to understand the factors that influence the adult learning process. Aspects such as learning styles and learning preferences and how motivation influences learning are important elements of the learning effectiveness equation. Finally, what techniques can be employed to support learning effectiveness will be explored.

"We learn when what we do has reinforcing consequences." Aristotle.

Studies have found that learners have a better chance of learning if what they are learning is placed in the context of use and when they make sense to the learner. This learning is characterised as "taking in information, interpreting it, relating it to what they know already, and when necessary, reorganising their cognitive structures to accommodate new understanding." (Montague and Knirk, 1998, p. 3-9).

This interactivity is referred to as active learning. The learner takes the information and transforms it into a new, personal meaning. This concept describes the foundation for naval officer training. The constructivist approach to learning permits the learner to co-construct meaning of new material, solve problems, or apply new information to a situation that (s)he helps to define (Campbell, 1999).

This learning concept is supported by Bloom and his colleagues' theories of educational objectives, Figure 2, and Knowles theories of adult learning, which will be discussed later in this section. The majority of training provided at NOTC is focused at the knowledge and comprehension levels of educational objectives. In preparation for employment in the fleet the final stages of their basic naval officer training sees the introduction to problem solving at the application level where the students apply their new found knowledge in solving unfamiliar problems (Reigeluth, 1999, p. 52).

BLOOM'S TAXONOMY	
Knowledge	Students working at this level can remember and recall information ranging from concrete to abstract.
Comprehension	At the comprehension level, students are able to understand and make use of something being communicated. Bloom felt that this level was the major emphasis of schools and colleges. In this level, students can translate, interpret, and extrapolate the communication.
Application	Students can apply appropriate concepts or abstractions to a problem or situation even when not prompted to do so.
Analysis	Students can break down the material into its parts and define the relationship between the parts.
Synthesis	Students create a product, combining parts from previous experiences and new material to create a whole.
Evaluation	Students make judgements about the value of materials, ideas, and so forth.

Figure 2.

The majority of students at NOTC are young Canadians, between 20 - 30 years old, with the maximum age of 45 years old. This, in the context of learning, is a major factor as to how to identify and select the method of instruction. Malcolm Knowles, in his theories on Andragogy, the study of adult learning, proposes that adults learn differently from adolescents and children. The psychological definition of an adult is when they become aware of the concept that they are responsible for their own lives. With this Knowles proposes six fundamentals related to adult learning (Knowles, 1998).

The learner's self-concept. Once adults have arrived at the stage where they take responsibility for their own lives, they develop a deep psychological need to be seen and treated by others as being capable of self-direction.

The role of the learner's experience. Adults enter a learning experience with both a greater volume and wider diversity of experience over children.

Readiness to learn. Adults are ready to learn what they need to know and be able to do in order to cope effectively with their real-life contexts.

Orientation to learning. Adults are problem-centred, or life-centred, in their learning orientation. They are motivated to learn to the extent that learning will help them perform tasks or deal with real-life problems.

Need to know. Adults need to know why they should learn something before devoting the energy to it.

Motivation. The best motivators are internal, such as self-esteem, quality of life, or increased job satisfaction.

To properly support Knowles' six fundamentals it is essential that courses be correctly constructed. One model that has effectively influenced course development for nearly forty years has been the Carroll Model. The premise of this model is given enough time anyone can be trained regardless of the subject. This model accounts for five learning variables, three of which can be expressed in terms of time, and the other two in achievement (Carroll, 1988).

Aptitude: is the name given to the variable or variables that determine the amount of time a student needs to learn a given task, unit of instruction, or curriculum to an acceptable level of mastery.

Opportunity to learn is defined as the amount of time allowed for learning.
Perseverance is defined as the amount of time a student is willing to spend on learning the task or unit of instruction; in this sense it becomes an operational definition of motivation to learn.
Quality of instruction is assumed to be related to achievement. While the model in not very specific about the characteristics of high quality instruction, it mentions that learners must be clearly told what they are to learn, that they must be put in adequate contact with learning materials, and that steps in learning must be carefully planned and ordered.
Ability to understand instruction is described as including, besides language comprehension, learners' ability to figure out for themselves what the learning task is and how to go about learning it.

The significance of this model to the review and development of officer training at NOTC is it allows course developers to focus on those areas of training that are controlled by the school: opportunity to learn and quality of instruction. The remaining three areas, while not controlled by the school, can be influenced by selecting appropriate training methods and effective course design.

We can see from the findings provided by Knowles and Carroll that relevance of the material being instructed and the degree the student is motivated to learn the material will directly influence the amount of perseverance the learner will bring to the course. While it is important to understand the impacts of the different factors presented by these two researchers, the focus of the recommendations from this study will be on those elements that can be controlled by the school through course design and delivery.

The final area of learning theory that will be introduced in this paper refers to learning styles. David Kolb (1984) proposes a theory of experiential learning that involves four principle stages:

- concrete experiences (CE)
- reflective observation (RO)

- abstract conceptualisation (AC)
- active experimentation (AE)

Kolb explains that CE/AC and RO/AE are at opposite ends of the learning style spectrum. He goes on to propose that there are four types of learner, depending on their position on these two dimensions: divergers, assimilators, convergers, and accommodators. An example would be an accommodator prefers concrete experiences and active experimentation (Kolb, 1984). As this information pertains to training development Katy Campbell states, "theoretically, knowledge of cognitive and learning styles could be used to predict and design for individual learning tasks. ...this implies designing a number of different treatments for a learning task and giving learners control over which one(s) they choose." (Campbell, 1999, p. 4-11). In an ideal world this should be a done, however, fiscal realities and the current state of technology prohibits pursuing this goal (Kolb, 1984).

The determination of the different learning styles for each student will assist both the instructor and learner in achieving the learning goals. For the instructor it will identify those students that may have difficulty with a particular designed course, as it may not be suited to the students learning style. For the student it would serve as a self-awareness of their learning style and identify areas where more concentration may be required in order to learn the course material.

Two other learning style areas that have an impact on how effectively a learner will learn are perceptual and cognitive styles. Perceptual style refers to the preferred sensory modality for receiving information: visual, aural, and kinaesthetic. It is difficult to provide all three modes of perceptual style because some subjects do not led themselves to supporting that style. However, if the learner is aware of his/her preferred perceptual learning style then they can compensate for courses that do not cater to their particular perceptual learning style.

Cognitive styles refer to the preferred way an individual processes information. This usually refers to those areas of a person's makeup that affects attitude, social interactions, and belief systems. An example of a cognitive style is field dependence versus field independence. A field dependent person will take a global approach to issues where a field independent will tend to be more analytical. In the development of courses this is important because it will determine whether the developers should present the course in a holistic or a parts/whole format (Campbell, 1999).

This recognition of the different cognitive learning styles poses the question as to which style should courses be designed. MacKeracher (1995) proposes that an individual is not one or the other but possesses qualities from both styles at varying degrees. She suggests that learners would be more successful if both holistic and analytical learning styles are supported. "Learning opportunities should be based, as much as possible, on authentic tasks and environments, and include opportunities for reflection and application." (Campbell, 1999, p. 4-12). To help achieve these goals Schank and Cleary have developed five teaching architectures and key cognitive strategies. These five do not represent a list from which designers will select one from which to develop a course but provide an arsenal from which developers, teachers and learners can draw from to maximise the effectiveness of the training.

1. Simulation-based Learning by Doing

Humans learn by doing. Learning a new skill, then, would ideally include practice with the actual skill, accompanied by coaching, advice, and correction by an expert. The very nature of simulations requires active participation by the learner, who may sometimes 'enter in' to the simulated world as an actual participant.

2. Incidental Learning

Much of the information to be learned is not inherently interesting (think of the multiplication tables). Lists and facts are learned naturally, however, by engaging

in fun tasks whose outcomes are interesting. In this design the base facts are imparted almost covertly.

3. Learning by Reflection

This strategy is appropriate when learners need to ask questions about their learning or need someone of whom to 'bounce' their ideas. In this case, the instructor (who could be virtual) helps the learner analyse the problem and find ways to continue in their progress.

4. Case-based Teaching

Imparting information at the precise moment of need has been recently dubbed just-in-time learning. In this architecture, learners may consult an expert when experiencing difficulties or out of curiosity. Experts, by virtue of their expertise in a field, have a large repository of stories to tell, or cases, which illustrate key learning elements relevant to the task at hand.

5. Learning by Exploring

When learners become involved in their new tasks, they naturally generate questions. These questions are optimally answered at the time they are generated. The key to this architecture is conversation, either virtually or in face-to-face interaction (Schank & Cleary, 1995).

Throughout their career naval officers are required to progress their professional knowledge through self-study. Learners must have the ability to be self-regulating, self-evaluating, and be proficient in scheduling and time management and know how to use different learning techniques. The United States Navy has recognised the value of teaching metacognitive learning, learning how to learn better, as an essential component in preparing students to be better learners both in the schools and at distance (USN, 1998a). Students who understand their learning style will be better prepared for this life long learning journey.

While the consideration of all the aforementioned theories and practices are important to understanding learning and therefore good course design and instruction this truly represents only the potential for effective training. This potential is translated into learning when the learner is motivated to use the tools and information to learn. The key to understanding how to make training more attractive is to understand what influence causes a learner to approach or avoid a learning task (Keller, 1983).

Keller proposes in his theories on motivation that there are four different components of course design that should be considered in order to motivate learners to persist with the training and learn. He developed a model known as the ARCS model. This acronym translates into, attention, relevance, confidence, and satisfaction. In his articles on this subject he explains that the first step is to grab the attention of the learner and then present the training in such a way that the course will maintain the learners curiosity. Once the attention of the learner is secured it is important to demonstrate to the learner the importance and relevance of the course to his or her future. The third step is to move this attentive, focused learner and present the course to them in such a manner that they feel confident that they will succeed in the learning and therefore the course. The final item for consideration is the requirement for feedback to the learner so they derive constant satisfaction that they are progressing in their learning journey and therefore will maintain a high level of motivation to continue with the course. As well as the meaningful extrinsic motivational re-enforcement from instructors and peers it is essential that the course be developed so that the learner develops intrinsic motivational capabilities (Jonassen reporting on uses of the ARCS model, 1987). More details on the sub-categories of the ARCS model can be found at Appendix B.

In the navy it is well understood that motivation is important in achieving the maximum performance of those under your charge. By applying the same due care and diligence to motivation in training and following the guidelines prescribed by Keller it is perceived that the students will not only complete the training motivated but will better understand the knowledge they have acquired throughout the different MARS training phases.

There are myriads of factors that impact upon an individual's ability to learn. This review of learning, especially adult learning, attempted to highlight those factors that will probably have a large influence on the course development, technology selection and learning outcome of young Canadians seeking a career in the navy. "Individual learning differences do affect learning, but researchers simply do not have the tools and methodologies to adequately measure or study them." (Knowles, 1998, p. 154).

The field of learning theory is full of qualitative research that provides good data and signposts for future developments. It is the intent of this paper to review existing school instruction and course design practices and identify areas where improvements in effectiveness may occur through the judicious application of the qualitative research findings.

Effectiveness and Training

Within the training world there are those who attack the traditional methods of training as being too formal, too one-way, and teacher-centred vice learner-centred. Jinney Goldstein, CEO of the PBS Business Channel says organisations have to move beyond the traditional "spray-and -pray" style of training. Learners also have to realise that learning is more than, "I occupied a chair. I passed a quiz. I have a certificate in my personnel file. I am trained." Organisations are discovering the value of technology in taking the training to the learners, providing alternate instructional methods of the training material and unleashing the power of collaborative training (Hibbard, 1998).

As a result of the growing interests and documented positive results from using good course development practices and technology to deliver training more research is being conducted into the effective application of computer mediated training. Karen Cowen (as reported by J. Hibbard), program development administrator at Chrysler Financial, stated, "there's a 80-20 model that says you only need a live person for 20% of what you're learning." This is a very bold and thought provoking statement that this

researcher has been unable to collaborate. This being said, research does support the premise that training can be conducted effectively at distance, at the learner's own pace, without the direct involvement of an instructor (Chute et al., 1999). The key for any organisation wishing to pursue this course of training delivery is to determine which subjects are suitable for this type of instruction and what training is required by the learners and staff to effectively conduct computer mediated instruction.

There are many methods and media available to support training both in the schoolhouse and at distance. They range from the traditional teacher-student interaction in a classroom setting to full multimedia computer mediated training conducted in a virtual classroom. Appendix C provides a synopsis of the different media used to support training. This synopsis includes advantages and disadvantages as well as estimated costs to establish training in each medium. This information is from a report by Director of Individual Training on Distributed Training and Alan Chute et al. Book on Distance Learning (DND, 1991; Chute et al., 1999).

The increasing training demand, the dispersed location of the learners coupled with the finite time the officers are available for traditional in house training has created a requirement for the Canadian navy to search out alternate methods of delivering basic MARS training. This challenge is to be addressed without compromising the current training standards. Admiral Tracey, Director of Naval Training for the USN, views DL technology as critical components to providing more technically trained warriors to the fleet in less time (USN, 1998b). In the case of NOTC, the goal could be to use DL technology to permit the increase of training curriculum thereby providing better-trained officer to the fleet without increasing training time.

Distance Learning is defined as, "all forms of learning which are not under continuous, immediate supervision by tutors present with their students in classrooms or on the same premises but which, nevertheless, benefit from the planning, organisation, guidance and teaching assistance of a supporting organisation." (DND, 1999d, p. A-1/4). The technology and course design that is required to support the DL training

methodology can be effectively used within the schoolhouse. By developing courses for DL, organisations afford themselves the flexibility of providing an alternate method of instructing courses on site.

DL is generally supported by two different methods of communications between the students and the teachers. In the "synchronous mode" students and teachers are present at the same time during instructions or discussions, whether in the same location or at distance. The "asynchronous mode" refers to when students and teachers do not have same time connectivity with each other. Media that supports these two modes of communications include television, videotapes, audiotapes, videoconferencing, audioconferencing, e-mail, telephone, fax, computer software, and print (Phipps and Merisortis, 1999). Learners spread over 4 1/2 time zones will present a particular challenge to NOTC for a synchronous DL course.

The maintenance of the competitive edge or operational effectiveness coupled with a requirement to maximise the bang for the budget buck has forced organisations to gain efficiencies through the reduction of training time. The United States Air Force have defined their goal for training expectations derived from DL to be "achieve 30 percent more learning in 40 percent less time, while achieving a cost savings of nearly one-third over conventional methods." (Cherry, 1996). The Canadian Air Force January 2000 Service Paper states the challenge facing individual training and education is to find ways to shorten development time and course length and to bring the training to the learner (DND, 2000). These two examples are representative of numerous organisations that are expending efforts to seek out efficiencies in delivering training.

Technology has produced a variety of media for training that advertise portability and reduced training time. There are claims that Computer Based Training (CBT) can reduce training times by 30%. Web based training supposedly can reduce training time by as much as 50%. Indeed, in conjunction with the reduced training time, added benefits of DL are the increased training opportunities and less time away from home. Therefore there will be a reduction in costs associated with sending learners away for

training and therefore increase their quality of life (Chapman,1999; Legassie, 1999; USN, 1998a).

There are researchers who have reported that Computer-Based Instruction (CBI) can deliver the same course as well or better than traditional training methods in less time. This claim was backed up with research that reviewed 40 studies comparing military classroom instruction with CBI. In 15 cases the students' performance achievement improved, 24 cases remained the same and 1 became worse. This review also found that in the aforementioned cases the training was completed on average in about 30 percent less time (Montague and Knirk, 1998). While the details of the conduct of this research were not provided in the report the findings do support the notion that some training delivered with the assistance of technology can produce the same training results in less time.

While there is evidence that technology can assist in the reduction of training time, attention must be paid to the effects these changes from traditional training methods have on students and instructors. Indeed, Stemler (1997) suggests that when CBT courses are developed there appears to be little consideration afforded learning theories and principles of instructional design. Regardless of the technology, sound course design practices is the key component to successful learning. "To be effective, developers must pay attention to screen design, feedback requirements, assessment procedures, re-mediation loops and student activities." (Legassie, 1999, p. 23).

The research presented to this point heralds the power and effectiveness of the new media afforded by technology to improve learning while reducing the instructional time. Richard E. Clark (1983) proposes that there are absolutely no efficiencies in learning to be gained by selecting different media to support training. He states, "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition." (Clark, 1983, p. 445). He proposes that the successes that are being recorded by researchers studying the effects of the different media on training effectiveness are probably related

to the increased care and attention in course development for the new media and the different animation and presentation processes. To this end, it was important for this study not to lose sight of necessary cognitive process essential to effective course design.

Even within the traditional classroom environment training methods supported by technology are proving as effective as traditional face-to-face (F2F) methods (Legassie, 1999). This in itself is not a reason to change current training methods but the use of technology does provide an alternate approach to presenting a subject effectively in a format that is possibly more suited to the students learning style or preference. Using technology to deliver training, whether in the classroom or at distance, affords establishments the opportunity to provide multiple presentations of the same subject. This has been found to increase the effectiveness of training by permitting students the ability to take advantage of a medium's specific characteristic to help construct knowledge (Montague and Knirk, 1998). As well, alternate learning methods using technology, introduces learners to learning methods that will become more predominant later in life.

Courses that were once deemed unsuitable for DL are now being developed through the use of multimedia courseware. Originally DL courses were developed for delivery within a single medium. Trainers who have been using technology to enhance training are learning that most technologies are multifunctional and can be adapted to cover a wide range of learning outcomes. The combining of different media to deliver a course has permitted the development of more types of courses for DL and increased the effectiveness of courses. This evolution is referred to as third generation of DL systems (the first being correspondence courses and the second being single medium) (Phipps and Merisortis, 1999). This development is important to NOTC as it has the potential to increase the number of course that could be delivered outside the school.

The multifunctional and modularity of data comprising courseware permit opportunities outside of the training venue. It is conceivable that portions of the basic officer training program courseware will be included in operational computer mediated decision aids supported by an Electronic Personal Support System (EPSS). This

reusability and re-purposing of courseware development efforts is actively being pursued by the USN and should be considered for use in the Canadian navy (USN, 1998a).

Whether technology is used to enhance training or address a training shortfall the selection of the appropriate medium and training method are critical components to effectiveness. Prior to answering this question it is important to establish the learning needs of the organisation and the student. What content should remain in the formal setting? What content should be distributed? What content needs to reach a large disbursed student population? (i.e., core instruction modules). What content can be repurposed to meet a wide range of learning requirements? What are the parameters and constraints for distributing the instruction? What forms of distributed learning are appropriate to present the content under what circumstance? In addition to these questions consideration must be given to the learner: degree of student interactivity, individual learning styles, and should the pace of the course be under the control of the learner (USN, 1998a)?

If DL is determined to be a viable method for conducting portions of naval officer training then it is essential that a comprehensive implementation plan be developed. Alan Chute et al. (1999) provides these ten steps to developing successful DL programs.

1. Determine your needs up front.
2. Look to DL as a way to revitalise and innovate the existing training program.
3. Start using a multilevel evaluation approach.
4. Keep the focus on what you are learning, not on the technology that is helping you learn.
5. Market your DL program internally and externally.
6. Use on-site co-ordination.
7. Obtain local field manager commitment.
8. Make sure the instructors are well trained.
9. Design programs specifically for DL.
10. Use reliable equipment. (p. 10)

These ten steps, which are supported by Margaret Driscoll's Web Based Training and Brandon Hall's Web-Based Training Cookbook, will form the outline for the overall development plan to establish DL as one of NOTC's training methods

How wide spread is the use of Distance Learning? The United States Department of Defence views DL as an integral component of their future training pillar. The Advanced Distance Learning (ADL) initiative is intended to "provide access to the highest quality education and training, tailored to individual needs, which is cost-effective, and can be delivered whenever and wherever it is required." (U.S. Department of Defense, 1999, p. 7). This initiative will not just be a retooling of current training practices but a paradigm shift in learning. The strategy is to move away from "classroom/teacher-centric" model to a more "network/learner-centric" model. Given the size and global dispersion of the US military the ability to deliver training wherever and whenever are two key DL drivers.

When addressing the time component of training the first sub-component that will be discussed is the sequence in which the training is provided to the learners. As with most training the basic or foundation knowledge learned during the initial phases of training serve as stepping stones to more advanced learning objectives. A major issue when pursuing the time efficiencies offered through technologically enhanced learning is how much foundation knowledge must a learner have about a subject before self-paced DL method of instruction is viable? The United States Navy (USN) has researched this issue and has concluded that it is essential that all their personnel have a firm understanding of the foundation knowledge. Therefore, "all training within the first year of a seaman's navy life be conducted in a traditional setting using traditional modes of instruction." (Thurlow et al., 1999, p.18).

Other reasons why the USN has decided that officers and enlisted accession and initial skills training will continue to follow traditional classroom training regime is so the navy can foster "culture, values, traditions, warrior spirit, self-discipline, commitment, as well as, individual and team technical training." (USN, 1998a, p.7).

Even though the environment will be the traditional classroom settings technology will be predominant within the schoolhouse. This is being done to introduce the students to technology as a training medium and to "maximise the learning experience and increase student success rates." (USN, 1998a, p.8). This introduction to alternate learning methods while presented in a traditional environment is viewed as an excellent opportunity to prepare learners for future DL courses.

The complexity of the architecture required to support DL requires that a systems approach be adopted. It has been recognised that the DL system architecture must satisfy goals for "accessibility, operability, reliability, maintainability, enterprise-wide integration and the leveraging of both inter-organisational facilities and technology evolutions." (USN, 1998a, p. 14). To assist in accomplishing this initiative the US Department of Defence plans to maximise the use of the Internet and other public and private WAN systems. This issue is a topic of research and development for the CF and therefore any plans emanating from this study must be cognisant of the national information technology (IT) policies and developments.

One common requirement that exists in training, regardless of the environment or medium, is communications. The ability to communicate with the teacher or other students is critical to maintaining the motivation and persistence factors of the student. The connectivity should be built into the DL architecture, providing primary and secondary means of contacting course teachers or administrators, such as a 1-800 number when connectivity with the training server fails. One bad experience, especially during the initial stages of DL exposure, can have far reaching affects on how the learner will view DL (Madden, 1998; DND, 2000).

Jerome Johnston (as reported by Legassie) provides the following guidance in the selection of appropriate technology:

> The Software. This is defined as the radio or television program or the programming of the CBT and CAI. In order to succeed, it must relate to an existing need and meet the goals of the course.

The Hardware. It must be easy to use, available and suitable for learner use in the classroom. Cost and technical requirements can also affect this category.

Learner Characteristics. If the content is new to the learner, structured instruction is most effective. If the learner has previous experience with the content, unstructured presentations may be more effective. This supports the high usage rates associated with the use of video and CBT for refresher training in the CF.

Context and the Learners' Mindset. Simply put, this is the learner's reaction to the technology. If the learner views the technology as helpful to the instruction, it will be effective. If not, the training value will be limited (Legassie, 1999, p.18).

The inter-dependency of these four areas of DL requires equal and full attention to detail during development and implementation. A weakness in one area will reduce the overall effectiveness of the desired training.

The United States Air Force (USAF) has developed handbooks that provide guidance to designers of instructional systems. Volume 5 of this series, Instructional Technology and Distance Learning, provides a comprehensive guide for the analysis and selection criteria of instructional technologies. This guide covers such areas as media feasibility assessment, application of the criteria to the media, curriculum analysis and media feasibility, infrastructure and resource feasibility analysis, comparative cost analysis and finally once all these steps have been addressed, media selection. The guide provides good detail into the theories and practices associated with instructional technologies (USAF, 1998).

Another media selection tool, Advisor 3.0, is a computer application developed by BNH Expert Software Inc. This application's primary objective "is to develop a systematic and scientific approach that is unbiased and reliable for analysing a course to determine the most effective and economical method to deliver the training." (Bahlis, 1998, p. iii). After a close review it was determined that Advisor 3.0 addresses the same areas and provides the same advice as the USAF guidance documented. In the Advisor 3.0 user's manual there is an acknowledgement that all arms of the United States Defence organisation as well as the Canadian Forces have adopted this media selection tool.

The adoption of new technology and methods of training by an organisation should only be implemented after a pilot program has been completed and analysed. This step not only serves as a check into the viability of pursuing a course of technological action but permits stakeholders to become accustomed to the proposed change(s). Margaret Driscoll, in her book "Web-Based Training: Using technology to Design Adult Learning Experiences", offers the following 12-step pilot plan (Driscoll, 1998).

1. Clarify the purpose of the pilot.
2. Identify and enlist the support of a high-level champion.
3. Form a core team, and identify extended team members.
4. Create a set of evaluation criteria.
5. Develop a plan to gather data.
6. Match the technology and topic.
7. Implement off-the-shelf program, or develop a pilot program.
8. Prepare for rollout.
9. Conduct a dry run.
10. Deliver the program.
11. Gather data.
12. Summarise the experience, and make recommendations.

These 12 steps are currently being followed for the implementation of new technology supported training at NOTC and are proving very effective.

If self-paced technologically enhanced learning strategies are adopted it is important to properly prepare learners and staff to operate in this non-traditional learning environment. Without the willingness and ability to operate and learn in these environments learners and staff will not embrace these media for instruction. In the following paragraphs the required skills and considerations required to prepare participants in a technologically rich learning environment will be discussed (Phipps and Merisortis, 1999).

The first striking difference between traditional school training and distance training is the change in the learner's surroundings. At distance fellow learners no longer surround the learner nor does the learner have instant access to the instructor. While some of this isolation is resolved by synchronous, virtual classroom the learner is still physically separated from the course. It is therefore necessary that the learner be able to study independently and be self-motivated. This style of learning will not suit everyone and will be more difficult to adapt to some types of training (Chute et al., 1999).

Sylvia Charp reports that with greater autonomy, as that associated with DL, more crucial is the characteristics of active listening and the ability to work alone (Charp, 1994). David Godfrey (as reported by Cherry), a professor at the University of Victoria, found that in typical class at most 80 percent of the students possessed these characteristics. In order to support the remaining 20 percent a vital support organisation of teacher-student and student-student networking was established. This finding and subsequent action was mirrored in the USN's DL system where virtual classrooms were established to permit students and teachers to meet electronically to discuss issues and share notes on a virtual whiteboard (Charp, 1994; Sherry, 1996; USN, 1998a).

The result of these findings indicate that while a majority of the learners may be able to function or excel in a DL environment, care and attention still has to be expended ensuring the learning expectations of the minority are addressed. This can be done through the establishment of formal and informal chat rooms, more training in mastering the DL environment and never creating an environment that make the learner feel that they are alone. As a result of this observation NOTC will have to ensure good communication plans are woven into DL courses.

Recent research indicates that once developers and programmers have factored in all possible learning characteristics and good design practices there are two further actions that can be taken to enhance the computer mediated training experience. First, Justin Hibbard's research indicates that informal interaction with peers and an instructor is the most valuable form of learning in a group. He sites this type of informal,

collaborative training addresses 70 percent of learning needs of organisations such as Boeing, Motorola, and Siemens. He also goes on to state that collaborative training is not the preference of everyone and some enjoy the individual learning experience (Hibbard, 1998).

In a second study researchers found that learners using computer mediated training learned as well if not better when paired up with another learner. In the study learners who were paired with other learners performed better than solo learners within the same program. This could be attributed to lower anxiety towards the program, a more positive feeling of personal worth, and/or a better attitude towards the course content (Montague and Knirk, 1998). Regardless of the scientific validity of this research indications are that collaborative training in a DL or computer mediated course on campus can improve the learning experience for the students. A location where students and staff can meet for informal "chats" will be considered in NOTC course design as well as the implementation of the "buddy system" for learners where deemed appropriate.

There are two primary reasons why learners have difficulty adjusting to a self-directed training environment. They are "lack of effective study skills/strategies and lack of basic personal responsibility skills dealing with motivation to learn, handling stress and communication problems." (Madden, 1998, p.15). It was also determined that these weaknesses could be addressed through training and mentoring. To that end, modules were developed to teach the required skills to succeed. Those learners who completed the foundation learning modules were able to reach the criterion on all the tests. This study has proven that the skills needed for learners to succeed in a self-paced, independent learning environment can be learned (Madden, 1998). The employment of this preparatory DL training coupled with sound motivationally focused course design need to be factored into new training delivery proposals.

In concert with the adjustment required by the learners to function in this new learning environment, both procedural and technical, so too the teachers and supporting administrations have to change. Different teaching techniques have to be developed

around a program providing more hands-on work, and more active learning activities. To be successful in this new learning environment there has to be a paradigm shift in how the organisers and facilitators view training (Madden, 1998).

The inclusion of training technology into an organisation requires paradigm shift in instructor thinking. There will be the requirement to include the instructors in the development of the new training architecture. In addition, training and practice with the new technology is essential prior to attempting to deliver the training to the learners. Reports from Apple Computer suggest that it can take up to two years before an instructor will adequately adjust and be effective with technical training tools such as computer-mediated training (Sherry, 1996).

The implication of these findings identifies an issue as to who should be designated to facilitate DL, military personnel, or civilian instructors. The reason this is an issue is due to the mobility of military personnel. Historically military personnel are posted to a position for two maybe three years. Professional coursing and employment opportunities dictate the requirement for frequent moves. If it takes two years to develop a competent DL facilitator then the selection of the relatively static civilian subject matter experts would appear to be the logical choice. This issue is further investigated in the Chapter 5.

The introduction of technology in training will require significant resources and time. In addition to the time required for the conversion of the course material will be the time for the instructors to master the new medium and the learners to be comfortable to learn outside the traditional learning environment. This time delay could cause senior leaders to call into question whether the decision to opt for expensive technologically enhanced training methods is cost effective. This time delay must be included in the development equation of the new delivery method so that the return on investment (ROI) or business case, a critical measure of success by factions of every organisation, will occur at a realistic time in the development of the course (USN, 1998a).

The recent advent of the "learner-centred environments" focuses the learning on the learner. This learning concept readily lends itself to the DL environment. Research is currently underway that will one day see the development of interactive training sessions that determine user's learning style with a brief, but sophisticated, pre-course self-assessment and then branch off into exercises that are customised automatically for the learner (Goldstein, 1998). While the training community has yet to achieve this goal the direction of the research appears to address the concerns and recommendations presented in the aforementioned paragraphs on learning.

Cost and Training

In order to make an informed decision as to what training methodology is best suited for an organisation it is important to consider all associated costs. As part of this analysis costs associated with personnel, organisations, structure, infrastructure and current practices, and procedures must be factored into the training method selection process (DND, 1999e; Montague and Knirk, 1998). This analysis is increasingly more crucial as substantive increase in the school's budget does not appear to be on the horizon.

There are a number of cost analysis techniques that can be used to assist in the determination of the most suitable training method. These include cost-effectiveness, cost-benefit, cost-utility, and cost-feasibility. When reviewing the alternative training methods against an existing training objective cost-effectiveness calculation appears to include those considerations necessary to assist in making an informed decision. "Cost-effectiveness analysis refers to the evaluation of alternatives according to both their costs and their effects with regard to producing some outcome or set of outcomes." (Levin, 1983, p. 17).

Cost-effectiveness analysis of current and emerging training methods will provide a comparative analysis list that will support the training method selection to satisfy current training demands. In addition it will provide the flexibility to identify alternate

training methods should there be changes to training requirements or budgets. The analysis will, "...make it possible to choose those alternatives that provide the best results for any given resource outlay..." (Levin, 1983, p.11).

Cost-effectiveness will only work when programs with similar goals are compared and a common measure of effectiveness is used to assess them. This effectiveness information and the actual costs are then combined to determine the approach that provides the maximum effectiveness per level of costs. It is the author's intention to conduct a full cost analysis during the project definition phase in the fall 2000 (Levin, 1983).

While investigating alternate approaches to training using new and exciting technologies one must use caution when comparing these costs against traditional training costs. Too often the advantages associated with reductions in training time and consistency provided by computer based training is offset by the high costs and long production cycles (Legassie, 1999).

In determining which solution will provide the best value it is important to understand the level of effort and costs associated with the development of alternative approaches to training. The following table provides a sample of different programming used in training (Driscoll, 1998).

Programming	**Range of Tool Prices**	**Approximate Hours of Development/One Hour Instruction**
Hypertext/Hypermedia	$149 to $1,500+	20/1 Simple HTML 200/1 Web-development, computer-mediated.
Components	Freeware - $2,500	20/1 Simple programs with no modification to components. 200/1 Complex non-linear program with modifications to components and custom media.

Third-party	No applicable	16/1 Simple linear program using existing content and media assets. 400/1 Complex non-linear programs with custom media assets.
Authoring Software	$199 - $30,000	4/1 Simple linear program using existing content and media assets. 400/1 Complex non-linear programs with custom media assets.

Table 1 Costs Related to Tools and Labour

Associated with the initial effort to purchase authoring tools and pay for developing the module there are life cycle costs that must be considered. It is estimated that 20 percent of the original material will have to be updated or revised annually. Yearly maintenance costs is 10 percent of the original purchase price of the equipment. In addition there will be ongoing training management support, which includes the distribution of materials, tracking student performance and monitoring the effectiveness of the program (Kearsley, 1985). The USN has budgeted $24 million dollars for the implementation of distributed learning between 1999 and 2005 (Thurlow et al., 1999).

As one move towards technology to address training requirements, the types of functions provided by supporting personnel will change. They will evolve from the traditional suppliers of paper-based material and examinations and face to face instruction to database managers and network/systems administrators and course facilitators. These changes will require personnel to undertake upgrade training and be allowed the opportunity to master the new training medium. This cost of both money and time must be included in the proposed changes and subsequent implementation plan (Sherry, 1996; USN, 1998a).

As more technology and courseware is used to address training requirements it is possible to use existing programming material to support other training with the same learning objectives. By adopting an approach that will support reusability and re-

purposing of learning and incorporate this technique in the development of distributed learning it is possible to extend the original cost benefits by capitalising on existing efforts. This cost avoidance approach should permit funds to be available for other projects while still advancing new distributed training modules (USN, 1998a).

The use of cost as a selection criteria goes far beyond the initial purchase of hardware or courseware. It is essential that a careful cost-effectiveness evaluation be conducted to justify the selection of an alternate method of delivering training (Montague and Knirk, 1998). The results may produce findings that would be quite different if the cost and effectiveness of an initiative were developed in isolation on one another.

> This hypothetical example tends to reflect the situation that is all too common in actual evaluations, in which the most "effective" approach is not always the most cost-effective. Yet, without an analysis of costs, it would be impossible to know this. Further, the adoption of the most "effective" alternative can actually cost many times as much as the most cost-effective one. (Levin, 1983, p. 21).

The software application, Advisor 3.0, selected to assist in media selection for the courses instructed at NOTC also has a thorough cost-effectiveness analysis function that includes all the factors discussed in the aforementioned paragraphs on cost. For that reason the final results of the media selection process in the fall 2000 will include the cost-analysis results.

Summary

This review provides insight into those theories and practices that contribute to the understanding of adult learning. The literature review also provides a comprehensive definition of effectiveness as it pertains not only to the application in the Canadian Forces Training Systems but also in the large training context. More is understood as to how technology is playing an ever-increasing role in training and what efficiencies can be

expected by adopting these training media. Through the effective use of technology more options as to how courses can be delivered are evolving. Courses that are developed for more than one method of training provide a better chance of effectively training personnel.

CHAPTER THREE

METHODOLOGY

Introduction

In order to seek out training efficiencies in the Naval Officers Training Centre three areas needed to be reviewed and researched. The first area reviewed was how training is currently conducted at NOTC and to what degree good training practices identified in the Literature Review are incorporated into school instructional methods. The second area was to search out the most effective method and media of instructing each subject or enabling objective in the MARS officer curriculum. The final area, which will take place outside the context of this project, will take the results of the first two phases and develop an implementation plan to address NOTC 's training challenges. Chapter Six will provide recommendations on how to progress the implementation phase.

Methodology Description

The success of this study was dependent on engaging all stakeholders, including the researcher, in all areas of the research. A community-based action research approach was adopted for this study therefore permitting access to the training experiences of instructors, administrative staff, and students. The advantages of adopting this approach is the team that assists in the different phases of the research, data compilation, analysis, theorising, action and evaluation, will be the same people that will form part of the implementation team. This involvement will develop the ownership this researcher deems essential for successful implementation of the project's findings (Stringer, 1996).

> Stakeholders participate in a process of rigorous inquiry, acquiring information (collecting data) and reflecting on that information (analysis) in order to transform their understanding about the nature of the problem under investigation (theorising). This new set of understanding is then

> applied to plans for resolution of the problem (action), which in turn, provides the context for testing hypotheses derived from group theorising (evaluation). (Stringer, 1996, p.10).

The information presented in this chapter follows the steps Stinger describes in the cycle of the action research model, "look, think, act." (Stringer, 1996, p.17). To further amplify the research action taken the five steps to be used for problem inquiry described by Kirby and McKenna (1989) was used throughout this project. They five step are: begin to focus, find a research question, gather information, analyse the data you collect and produce a report of your findings. The plan on how to address the research questions will be presented. This will be followed by observations about how the plan will be implemented. The action phase will provide feedback as to the challenges and success of implementing the research plan. Making sense out of the data is the next and arguably the most interesting and challenging phase as this will not only provide possible answers to the research questions but will also provide the way ahead for the next cycle of the action research process. It must be understood that the strength associated with the action research cycle is in its iterative process requiring constant revisits of past actions and revisions to future research plans.

Planning Phase

In order to adequately address the challenges confronting NOTC as described in the research questions it was deemed necessary to employ a number of different data collection and analysis methods. The first tool to be employed was the traditional Literature Review. By focussing on the research questions it was possible to search out information relevant to NOTC's training challenges. This research has been completed and the results are available in Chapter Two.

The diversity of the training challenges facing NOTC coupled with the requirement to engage the stakeholders in the problem-solving process led to the establishment of the New Training Paradigm Advisor Group (NTPAG). This group is

comprised of subject matter experts (SME) from the following groups: MARS Officer Instruction, MARS Officer Training Material and Course Development, Web Based Courseware Development, and Information Technology. A list of the NTPAG members is provided at Appendix H. The talents resident in the NTPAG were used to brainstorm ideas (concept mapping) and to assist in the interpretation of the collected data during the reflective phase of the action research cycle.

In order to collect data from the NOTC stakeholders, the students and instructors, it was decided that their input would be solicited initially through a questionnaire. The purpose of the questionnaire was to assess the impact technology has on motivation and measuring attitudes towards technology and the learning process. To achieve these goals two questionnaires were developed during the Planning Phase, one for instructors and one for students. The questionnaires selected for this project had been previously validated and used for a Master's thesis that focused on attitudes towards technology and training in the Canadian Forces. The questionnaire was used and modified with the permission of the developer, Capt. R. Legassie (Legassie, 1999).

As an adjunct to the questionnaire a semi-structured interview process was created using the appreciative inquiry format. The goal of the interview process was to seek clarification to ambiguities in the questionnaire responses and to tease out the pertinent information that accurately reflects the attitudes and degrees of support on distributed learning for naval officer training. These interviews were directed at both students and staff.

The final research tool planned for this project was a computer application developed to assist training institutions in the selection of different media to support training objectives. This tool, Advisor 3.0, uses all the relevant training development, methods, media and associated costs considerations, currently provided by the USAF and CF media manual selection guidelines, in formulating its recommendations (USAF, 1998; DND, 1999e). Advisor 3.0, "assists in selecting the most cost-effective method (instructor-led, print, tales, computer based training (CBT), web based training (WBT),

electronic performance support systems (EPSS), audio/computer/video conferencing or Internet) or combination for the delivery of a training course." (Bahlis, 1998, p.1). Advisor 3.0 application provided a powerful technologically advance media selection tool to assist the NTPAG in the determination of the most effective media for each EO instructed at NOTC. This EO data input can be analyses to produce three outputs: Feasibility Analysis, Cost Analysis, and Risk Analysis. The outcome desired for this project is limited to the Feasibility Analysis, which will determine effectiveness of the different training deliver media. The remaining Advisor 3.0 analysis will be conducted during the final phase leading to the development of the implementation plan.

Observation Phase

The foundation to this project was the literature review. Given the focus on emerging media to support training a considerable amount of research for related material was conducted on the Internet. This was supported by published studies, current CF training regulations and guidance and finally reference material in the form of books.

The members of the NTPAG were required to adjust their workload so that the duties associated with being a member of this group took priority. This placed a considerable amount of onus on the researcher to provide the correct amount of leadership and motivation to extract maximum performance. This task has been made easier with the excellent co-operation from all but most importantly with the assistance provided by the Deputy Chair.

Action Phase

Armed with the information garnered from the extensive literature review and the survey questionnaires the researcher engaged the NTPAG in a brainstorming session about different training methods and media. This session resulted in a way ahead for future research and led to ideas about potential solutions to the problems identified as the focus of this study. It confirmed the utility of the questionnaire as a means of identify attitudes and individual capabilities with respect to advanced media technology. As well,

an action list for further research was developed and tasks were assigned to the appropriate subject matter experts within NOTC.

Those who participated were briefed on the project and their associated roles. All participants signed a consent to participate form, a copy of which is attached in Appendix E. The questionnaires were administered to all 58 students in attendance at NOTC. This provided responses for a cross section from all phases of MARS training. The instructor questionnaire was, as with the student questionnaire, provided to all 27 instructors on staff. A copy of the instructor and student questionnaires is provided at Appendices F and G.

The participation from the student population represents 93% (n=54) of all the students in-house during the survey period. The sample base for instructors represented over 80% (n=17) of personnel employed in this function. The researcher is confident that this amount of cross sectional participation provides a good indication of the level of technological experience and attitudes towards technology in learning.

As the Commanding Officer of the school, the researcher had to take precautions not to intimidate the students and staff into completing the questionnaire. To this end, administrative staff, after being properly briefed, administered the questionnaire to the participants. All completed questionnaires were returned in a sealed envelope to the school secretary where the results were transposed into a table. No individual interviews were conducted until the results of the survey were reviewed.

The process of data input into Advisor 3.0 commenced with three meetings to resolve uncertainties and make decisions on a number of the data inputs that had yet to be quantified. Data input for the Feasibility Analysis included information on training policies and procedures, organisational needs (administrative, course, trainees), training needs (instructors/facilitators, trainees, course, content), instructional needs (trainees, content, apply learned material). The sub-components, noted in brackets, were further broken down. For example under instructional needs (trainees) data input was required

for the following sub sub-components, receptive to computers, reading ability, resistance to change, motivation, skill/proficiency, ability to travel, access to computers, access to Multimedia PC, access to Video Conferencing, access to Internet/Intranet, connection speed. Ambiguous data input sections were discussed with the Advisor 3.0 data input team. The decisions affecting these input areas were annotated in the remarks section associated with the data input in question. This annotation of ambiguous inputs would allow audits to be performed on the actual data placed into Advisor 3.0.

The data from individual research, questionnaire, interviews and Advisor 3.0 were collected from November 1999 to March 2000. Through the use of the multiple inputs of data the researcher was able to cross reference material providing a degree of assurance as to the relevance and accuracy of data.

Reflection Phase

The collation of the questionnaire data was a major undertaking involving the efforts of the school secretary. Formatting the information that would permit ease of review and study required and number of formatting iterations. After a couple of attempts a successful Microsoft Access format was adopted. The results of the student and instructor questionnaire were then collated back onto a questionnaire with the replies to each question. This provided ease of review and comparison between the instructor and student responses.

Replanning Phase

The results of the questionnaire were reviewed and discussed by the NTPAG. From these discussions it was decided that interviews with a sample of students and staff would be required to clarify responses provided in the questionnaire returns. The interviews were conducted and included in the analysis of the questionnaires. The questionnaire was successful in that it provided direction for the next stage of research.

The results of Advisor 3.0 now provided a record of media recommendations for MARS officer training. These results served as the departure point for a more detailed analysis as these results only represent media recommendations without consideration for costs. In addition, the impact of any changes to an enabling objective can be quickly ascertained by inputting the proposed changes into the Advisor 3.0 data bank.

Data Analysis Methods

The data analysis process selected for this project is structured along the interpretive questions approach as described in E. Stringer's book on Action Research. In essence this approach requires participants to work through a series of questions. The results of these questions extend the understanding of the problem(s). "Interpretive statements that results from this process should help the participants to develop explanations that reveal the nature of the problem and important features of the context that sustain it." (Stringer, 1996, p. 87).

As part of analysing the interpretive accounts it is essential the participants identify the converging (common concepts) and diverging (concepts affecting a select few) prospective. This identification process will provide the direction for action or further research.

The decision to select community-based action research was made to enhance the probability of correctly identifying the problems, discovering possible courses of action and then the development of a proposal that will satisfy all stakeholders. The success associated with any recommendations is predicated on the "buy in" of the stakeholders. As stated by E. Stringer in his closing statement in the chapter on analysis, " Community-based action research is not just a tool for solving problems; it is a valuable resource for building a sense of community." (Stringer, 1996, p. 96).

CHAPTER FOUR

FINDINGS

Introduction

Understanding the learning process is essential in the development of effective training courses. As presented in previous chapters there has been a substantial amount of quantitative research on the subject of learning, including adult learning. The first part of this report of findings will focus on the learning process and those theories that contribute to effective course design.

The second section of this chapter will focus on the training challenges facing the Naval Officers Training Centre. Findings will be presented on new training methods and emerging technologies and how they could be used to increase training effectiveness and address the ever-growing curriculum. The key considerations to incorporating technology supported training and the results of the Advisor 3.0 media selection software application will also be presented.

The final section will present a summary of the findings. This summary will detail those findings that are viewed as pivotal to the efficiencies necessary for the navy to address the current and future NOTC training challenges. Recommendations will be presented in Chapter 5.

The Learning Process

Learning is the process that permits an individual to take information and convert it into knowledge that has a personal meaning. This, in the naval officer context, will allow an officer to apply naval knowledge in solving unfamiliar problems (Montague and Knirk, 1998; Campbell, 1999).

There are a number of differences between how adults and adolescents learn. The three major differences are that adults have more life experiences to assist in the conversion of the information to knowledge; adult learners have to understand the relevance of the training; and, motivation to learn is intrinsic to the individual (Knowles, 1998; Carroll, 1988). Of the students surveyed 53% indicated that their motivation to learn would be higher if they knew the purpose of using a specific technology for training. Seventy per cent of the instructors agreed that the students' motivation would have been positively effected had the relevance of using a specific technology been properly explained.

As described in Knowles' theories on adult learning the recognition and incorporation of those different factors that identify the differences between adult learners and adolescents will be in the manner the training is provided. For NOTC catering to adult learning requirements will enhance the cognitive process by naval officers under training. In the development and understanding of the adult learning process it is also important to consider other learning concepts such as those espoused by Carroll and Campbell. Of the considerations presented by these two theorists the two recurring recommendations are to permit the learner sufficient time to reflect and internalise the information and provide the training in the environment, or as close as possible to the environment, in which the knowledge will be used (Knowles, 1998; Carroll, 1988; Campbell, 1999).

Unless the learner is willing to spend time and energy to translate this information into knowledge even the best training plan will in all likelihood fail. Therefore, it is essential that learners be motivated to learn. This challenge is addressed in Keller's theories on motivation. He has developed a course development model, the ARCS model, which ensures that motivation, once developed at the beginning of the learning cycle, is maintained throughout. The premise of this model is that once the learner has been attracted to the course, the relevance of the material to his/her future success must be evident. The learner through the presentation of the course material must have the confidence that they will be successful in learning the course material. The final key

component of this instructional design model is the satisfaction the learner derives from the course must be genuine and meaningful. Constant praising from instructors or misplaced recognition of efforts will undermine the confidence and relevance of the course (Keller, 1983).

The process of taking in information and transforming it into knowledge varies from person to person. The variations of learning styles are described in David Kolb's (1984) theory on this subject. Learning styles vary from those who need concrete experiences and active experimentation at one end of the scale to abstract conceptualisation and reflective observation at the other end. In his theory Kolb explains that individuals do not fit one style or the other but are somewhere in between. By understanding how an individual learns, the instructor will be in a better position to assist the learner in assimilating the training data. For the learner, this information will permit him/her to understand why they might be experiencing difficulty in learning a subject, for it may be related to a training style not suited to their preferred learning style. Having a learning style does not mean that one can not learn to learn better (metacognitive learning) in different environments and different delivery methods. The USN places great importance on teaching students to be better learners as this will better prepare them for future learning challenges (USN, 1998a).

What learning style should courses cater to? The answer to this question resides in the ability to provide as many deliveries or presentation of a course as possible. This would address the requirement to cater to the different learning styles. In reality this is not always feasible. Therefore, Campbell (1999) suggests that training, "should be based as much as possible on authentic tasks and environments." (p. 3). The development of a variety of different learning methods would permit the learner to select that method best suited to their learning style. Campbell theories are supported by the results of the student survey on the appeal of different training technologies. As can be seen from Table 2 the closer the training technology was to the actual environment in which the naval officers were expected to exercise their new-found professional knowledge the higher the appeal registered by the students.

Training Media	Level of Appeal					
		1	2	3	4	
Overhead Projectors	No Appeal	14	25	14	1	High Appeal
Videotapes	No Appeal	1	12	24	17	High Appeal
Films	No Appeal	6	9	21	18	High Appeal
Chalkboard/Whiteboard	No Appeal	4	15	29	6	High Appeal
Textbooks	No Appeal	8	11	26	9	High Appeal
Study Packages	No Appeal	6	8	28	12	High Appeal
PowerPoint Presentations	No Appeal	11	26	13	4	High Appeal
35mm Slide Shows	No Appeal	18	22	10	2	High Appeal
Computer Based Training	No Appeal	13	19	17	5	High Appeal
Simulator Training	No Appeal	4	2	22	23	High Appeal
Training on Actual Epmt	No Appeal	0	0	4	50	High Appeal
Guest Lecturers	No Appeal	2	6	26	20	High Appeal
Field Trips	No Appeal	0	0	13	41	High Appeal
Classroom Lectures	No Appeal	4	13	31	4	High Appeal

Table 2

Training Challenges and Technology

As a result of the research it has been determined that there is a distinct difference between training methods and media that supports the different training methods. Training developers often confuse these two related but different subjects. At times successes in delivering courses using emerging technologies are attributed to the technology and not the redesign of the course material so that it can reside within that medium. Technology is simply the vehicle that transports the course material to the learner. Whether this is in the classroom or if the student is thousands of miles removed

from the instructor, sound course design is the key to successful instruction not the technology used to deliver the training (Clark, 1983). The observation that the emphasis should be on course design and not the medium is supported by the poor appeal of PowerPoint presentation as opposed to well structured traditional textbooks as recorded at Table 2.

This being said new and effective training delivery media are evolving to support traditional learning methods. Industry is realising the value of developing courses around the needs of the learner and delivering the training to the learner in a variety of training methods (Hibbard, 1998). DL research has proven that training can be conducted effectively at distance for the instructor at the learner's own pace (Chute et al., 1999).

There are a variety of alternate and emerging training delivery methods being supported by a variety of different technologies. From the list provided at Appendix C it can be seen that each method or media has specific advantages and disadvantages. The selection of the best method or medium will be dependent on the training needs of the learner, the organisation, and the resources available to support the desired methods. These considerations are imbedded in the Advisor 3.0 selection tool. Through input from the course developers Advisor 3.0 is able to provide a prioritised list of media suitable for delivering the course.

The requirements for each of the 226 EOs that are instructed at NOTC have been inserted into the Advisor 3.0 database. The results were published in a 140-page report, considered too voluminous for inclusion in this report. The results are available at NOTC for review. A summary of the findings is presented in Table 3. The summary will be presented in three general categories: classroom, simulation, and CBT/WBT formats and will compare training as it is now conducted to the recommendations put forward by Advisor 3.0.

MEDIA	CURRENT	RECOMMENDED
CLASSROOM	102	27
SIMULATION	92	84
CBT/WBT	32	115

Table 3

The NTPAG reviewed the Advisor 3.0 findings to ascertain the value of the results. After comparing a number of Advisor 3.0 results against results calculated using the USAF (1998) Volume 5 media selection guidance manual it was determined that results were similar and further use of Advisor 3.0 was warranted. A further analysis of these recommendations conducted by members of the NTPAG and compared against current training methods and delivery methods determined that there are 108 EOs that would require translation into another delivery format in order to optimise the effectiveness of the training objectives. It must be understood that these results only represent the recommendations for the most effective delivery methods without any consideration for costs. Costs associated with development, support infrastructure, delivery and maintenance of courseware and hardware will be factored into the equation during the fall 2000 development of the implementation plan.

The Advisor 3.0 results provide an indication that there are EOs within the NOTC training curriculum that would lend themselves to alternate delivery media. Therefore developing training within the media that will optimise delivery can increase effectiveness of training within NOTC. As well, those EOs that can be translated into media that are supported by technology suitable for distributed learning could assist in addressing the training that can not be provided in the current summer training period.

As organisation seek out training efficiencies one area that is most sought after improved efficiencies is time. Can the use of technology to deliver training reduce the training time? In a series of studies on the effectiveness of computer-based instruction it

was determined that students were on an average able to learn the course material in 30% less time over traditional classroom training delivery methods (Montague and Knirk, 1998). While details surrounding these studies are unavailable the results do demonstrate that time saving can be achieved. It is proposed that this time saving is primarily due to the redesign of the course rather than the selection of a different training media. Within the context of this study the overarching requirement is to seek out training efficiencies in all areas and not specifically in reduced training time.

The are many factors that determine the amount of timesaving associated with redesigning a course for a different media. These range from the effectiveness of the current course design and the instructors who deliver the training to the ability of the learners to function within the new learning environment. The following paragraphs will discuss ways NOTC can maximise the benefits available with the different training media.

There are three key considerations in the selection of different training media. The first is what media best supports the type of learning required. This function, as discussed earlier, is supported through the use of a media selection tool, such as Advisor 3.0. The next consideration is how much knowledge about the subject must a learner have before (s)he can learn using technology, especially if the learning is to be done a distance from the instructor. The USN have determined that within the military context it is essential that all their personnel have a firm understanding of the foundation knowledge and that during the initial training timeframe in addition to learning this foundation knowledge they are also indoctrinated in to the naval culture (Thurlow et al., 1999; USN 1998a). This last point, the cultural, values, team building, is considered essential in the initial naval officer development and therefore will be a major consideration for what courses are provided at distance from NOTC. These cultural, timing, personal development considerations can be factored into the Advisor 3.0 calculations.

The introduction of new procedures and technology into any institution requires careful planning. This planning includes communications, internal and external, infrastructure inventory and new supporting infrastructure identification, training courseware development, implementation team, and probably the most important the human and financial resources to bring the change to fruition. These areas form the foundation for a plan proposed by Alan Chute et al. (1999) into how to develop successful DL programs. This plan is used as an outline for the proposed way ahead presented in Chapter 6.

Once the infrastructure and personnel needed to support the new training media are in place it is necessary to develop and introduce the courseware to NOTC. Margaret Driscoll provides a 12 step plan that, if followed, should ensure an orderly introduction of DL courseware into the NOTC training inventory (Driscoll, 1998). This has not been the case at NOTC as supported by the results to the question on the students' reaction to the use of CBT or simulators. 10 students out of 53 experienced a positive reaction with use of technology in support of training. As well only 32% of the students reported increases in their motivation with the use of technology supported training. Therefore a more orderly introduction of courseware and training into NOTC appears warranted.

Other important considerations when developing a DL system architecture is to ensure the following goals are addressed: "accessibility, reliability, maintainability, integration" (USN, 1998a, p.14) and use of existing communication networks such as the CF Intranet and the Internet. Failure to have all these goals properly addressed prior to commencement of training will jeopardise the success of introducing effective DL.

The preparation of instructors and students, the stakeholders, to effectively function and learn within unfamiliar training environments is very important. The first step is to introduce the instructors and students to the concept of DL. This concept is not new to the instructors and students and some students have already conducted some type of coursing through DL. The questionnaire revealed the following information about the degree of familiarity and experience with computers for learning. Approximately 80% of

the staff and students have been using computers for more than five years and of the students 35% have experienced some form of DL. This information will determine the degree of effort required to indoctrinate stakeholders into the world of technology rich training. Regardless of these findings, the stakeholders have to be convinced of the utility and advantages of proceeding with this new course of action (Chute et al., 1999).

While the level of familiarity and competence with DL technology will vary amongst individuals a plan to ensure all stakeholders are at a sufficient level of understanding to operate within this training environment is necessary. Without this training learners and instructors may focus more on mastering technology rather than on the course material to be delivered and learned (Madden, 1998). The USN have adopted a strategy of providing the first year of basic training in the traditional school house environment with technology predominant in the classrooms (USN, 1998a).

The development of instructors to teach at distance requires the instructor to learn different teaching techniques, as well as requiring the instructor to master the technology used to deliver the courseware. For instructors to be successful in this new training environment there has to be a paradigm shift on how they view training (Madden, 1996). The inculcation of this new mind set and teaching techniques could take up to two years to develop within an instructor (Sherry, 1996).

Costs

The consideration of cost into the decision making process for the development and implementation of new training methods and media is as important as any other consideration discussed so far. However, in order to conduct a meaningful cost analysis it is essential that the degree of change be identified. The study into introducing different media for training some of NOTC's curriculum is still in progress. While a considerable amount of work has been completed there is still insufficient information to produce the cost results that will permit the development of an implementation plan. As stated earlier

the costing exercise will be conducted outside the context of this project. This being said, the following research findings on costing considerations are presented.

The development of courseware that will reside within emerging technology does not change the training objectives. In fact, the goal is to have the training effectiveness enhanced through this effort. Therefore, given the commonality of goals it is recommended that a cost-effectiveness analysis be conducted against those EOs deemed suitable for translation in DL format. This information will be useful for determining the priority of EO translation (Levin, 1983).

Other costs that must be considered in the implementation plan are related to hardware and courseware life cycle costs. Estimates of 10% of the original purchase price of equipment should be included in the annual operating budget. As well, retraining of existing staff and bringing on of new support personnel has to be included in the implementation plan (Kearsley, 1985; Sherry, 1996; USN, 1998a).

One method of capitalising on courseware costs is to adopt a program that will support reusability and re-purposing of training material. This cost avoidance will not only reduce the amount of funds required by NOTC to develop new courseware but by reusing components of existing courseware will ensure familiar format as well as the maintenance of a common courseware architecture. The benefits of progressing the re-purposing option is that courseware efforts from NOTC could be included into EPSS modules within the fleet (USN, 1998a).

Summary of Findings

As a result of the research, replies to the questionnaires, interviews with members of the NTPAG four major findings emerge. The first finding is related to the process of learning. The importance of understand the learning process particularly as it relates to adults is necessary if effective courses are to be developed and delivered. As well, there must be a requirement to make the students more effective learners. The development of

naval officers' metacognitive skills will assist in maximising the effectiveness of sound course design.

There are a number of proven tools and models available to assist in identifying the preferred learning styles of each officer and then ensure that there are sufficient alternate ways to deliver the course that will be suitable to the student's learning style. While this may not be practical for all courses, the identification of one's learning style will permit the learner to focus their energy when confronted with a non-preferred course delivery method. The development of courseware that will foster motivation to learn has to be a factor in training development. The ARCS model developed by Keller serves as an example of this training development consideration. Another area related to learning is that training should be conducted on authentic tasks and environments (Campbell, 1999). The difficulty of trying to achieve this goal in the past could have been related to the lack of operational resources.

The second major finding is related to technology and it uses as a method of delivering training. The proliferation of personal computers and access to the Internet affords many organisations the opportunity to seek out training efficiencies through technology. What gains can be accrued through the use of technology? While there are many, three that are of particular interest to NOTC are the portability of the training, the variety of ways the material can be presented to the learner, and finally, the possibility that there could be a reduction of training time.

The third finding of interest focuses on the selection and preparation of staff and students to function in a technologically enhanced training environment. Issues as to when learners should be subjected to DL courses, what training do the staff and students require prior to learning in non-traditional training environments and given the time to develop the teaching skills in a DL environment who should be providing the training? The USN (1998a) has concluded that DL will not be conducted until after basic training and that technology would be extensively used in the traditional setting in order to train

the learners to use the technology. Sherry (1996) reports that it can take up to two years of training and development before an instructor is proficient at mediating DL.

The final major finding concerns costs. While the selection of the optimum delivery media answered the question of the possibility of taking advantage of technology, the incorporation of the development, delivery and life cycle maintenance costs will address the cost effectiveness of pursuing technology as a delivery tool. The use of Advisor 3.0 has been excellent in identifying those EOs suitable for translation into alternate delivery media. This same tool appears to be capable of completing a cost analysis once all the associated costs have been placed in the program. While not related to development and delivery of training the USN are seeking cost avoidance opportunities through the re-purposing of DL training modules.

The following chapter will provide recommendations on how to enhance the training effectiveness and efficiencies at NOTC.

CHAPTER FIVE

RECOMMENDATIONS

Introduction

These recommendations represent a systems approach for changes to the training conducted at the Naval Officers Training Centre. These changes are based on requirements to provide more efficient training both in the school and at distance. These efficiencies could only be identified once the whole training experience had been researched and reviewed.

It is understood that there are influences impacting on the effectiveness of the training provided at NOTC that are beyond the control of the school, the navy, and indeed the Canadian Forces. The requirement to be aware of these influences and factor their impact on naval officer training still has to be included into proposed changes.

The recommendations in this chapter will address the core changes necessary to position the school to take advantage of new and emerging technologies. The technologies identified in this thesis are deemed crucial for NOTC to achieve her training mandate.

Learning

Based on the adult learning research by Knowles (1998) and Carroll (1988) and the response provided by the students on the impact of motivation on their learning, it is recommended that the course construction of all enabling objectives instructed at NOTC be reviewed for their compliance with adult learning theories. As well, the structure of the EOs should be compared against the design considerations espoused by the ARCS motivational model developed by Keller (1983).

The importance of effectively assimilating information into knowledge is greatly enhanced when one is aware of their metacognitive abilities and learning styles. The USN (1998a) has determined that in order to prepare their officers for the learning challenges of tomorrow they have to develop their learning skills. It is recommended that courses be provided to naval officers throughout their career to improve their metacognitive abilities.

The understanding of ones' preferred learning style is required from the first day of training within the CF. This awareness as explained by Kolb (1984) will permit the learner to select delivery styles best suited for his/her learning style or at the very least make them aware of instances when they are attempting to learn with a delivery style not suited to their learning style. It is therefore recommended that all naval officers be administered the Kolb Learning Style Inventory at the start of their MARS officer training at NOTC.

Efforts should be made to provide alternate methods of learning identified by Kolb (1984), to provide training in a more authentic format as suggested by Campbell (1999). As well, to support the students' survey response on the question related to the level of appeal on different learning technologies it is recommended that the use of emerging technologies be further explored for use in naval officer training.

Technology

The inability of the school to meet the current summer training curriculum within the specified time frame requires the incorporation of DL into reserve officer naval training. Advisor 3.0 results indicate that there is a number of EOs suitable for DL. It is recommended that further research be conducted into the infrastructure and resources required to support naval reserve officer DL.

An alternate method to address the training that currently exceeds the summer training period is to seek more effective methods of delivering the training at NOTC. As

reported by Montague and Knirk (1998) studies have demonstrated that computer based instruction can reduce training time by as much as 30%. These types of results indicate that further investigation into the use of technology to deliver training could prove to be of value. It is recommended that further development of computer based instruction courseware for NOTC be approved.

People

Prior to introducing changes into an organisation it is essential that personnel are ready to work within that new environment. The introduction of DL training that is dependent on emerging technology requires careful planning and acceptance by the stakeholders. This is supported by the survey question related to the introduction of technology into training at NOTC and the research by Alan Chute et al. (1999) and Driscoll (1998). It is recommended that NOTC adopt Chute et al. DL development plan and Driscoll's 12 step plan to introduce DL at NOTC.

Research by the USN, (1998a), stresses that the introduction of self paced computer mediated training should not be introduced until the student has been indoctrinated into the naval culture and possesses a basic knowledge on the subject targeted for DL. It is recommended that DL not be introduced until completion of MARS II. However in order to introduce the student to the technology and procedures that will support DL it is recommended that computer based instruction be used to assist in the delivery of MARS II training.

Given the amount of time required to develop a proficient DL mediator/instructor, up to two years as reported by Sherry (1996) and the two to three year naval personnel posting cycle it is recommended that alternate methods of staffing DL mediator positions be investigated. Adopting a four-year posting cycle for naval DL mediators and staffing the DL mediator positions with civilians are two options that will be investigated in the implementation plan development phase.

Costs

The ability to conduct cost-analysis on proposed changes to any organisation is prudent. Given the training objectives for NOTC will not vary regardless of the training delivery media Levin (1983) recommends a cost-effectiveness analysis be conducted. The media selection tool Advisor 3.0 has this capability. Therefore it is recommended that Advisor 3.0 be used to conduct the cost analysis of the aforementioned recommendations.

The ability to mitigate costs will assist in the approval of the NOTC DL project. The USN (1998a) has identified the requirement to seek out re-purposing and reusability opportunities for their DL modules. Therefore, re-purposing and reusability of DL modules and infrastructure to support non-NOTC requirements should be used to maximise the bang for the DL development buck. It is recommended that the NTPAG investigate opportunities within the CF to identify similar requirement partners.

Summary

The recommendations provided in this chapter address the core issues that support not only naval officer training at NOTC but all military training in the CF. It is possible that other Training Establishments may benefit from the research, findings, and recommendations provided. The training environment is in a constant state of development and therefore change. The changes researched to date are based upon the training fundamentals incorporated in this paper. By addressing the fundamentals the navy will be in a position to take better advantage of future technological training advancements.

CHAPTER SIX

FUTURE ACTIVITIES

OUTLINE OF IMPLEMENTATION PLAN

Introduction

This paper has been developed to seek out training efficiencies that would permit VENTURE to select and develop training methods that would address the increases to MARS training requirements. This was accomplished through research into adult learning and those processes that contribute to effective training. As part of this process, research was conducted into alternate methods of delivering training. This was followed by an inventory of the current curriculum and its validity, how the curriculum was instructed, and what technology was used to support this training methodology. As well, the training media selection tool, ADVISOR 3.0, was used to assist in determining the optimum delivery method for each enabling objective.

Over the last couple of years in an attempt to address the increase in quantity of training 12 EOs have been translated into a rudimentary self-paced asynchronous DL format coupled with the placement of these lessons on the Intra/Internet. These initiatives are envisioned as an initial step to addressing the current training and learning challenges facing the school. However, there has been no co-ordinated activity to guide these initiatives. Until this paper there has been little research linking the current training demands and methods to recognised adult learning theories and practices. In short, there was a lack of a systems approach to the changes VENTURE was attempting to incorporate into naval officer training. The following chapter will describe a way ahead that will lead to the development of a detailed plan to achieve the training efficiency needed to address the current and envisioned training challenges.

The Plan

The genesis of this proposal to incorporate DL into the training methodology at VENTURE is derived from The McGraw- Hill Handbook of Distance Learning (Chute et al., 1999). The Ten Keys to Success will form the outline for the following sections. Within this outline all the essential elements that must be considered for successfully establishing a DL program are addressed including the results of the NTPAG efforts to date. This outline has been collaborated with information found in Margaret Driscoll's Web-Based Training and Brandon Hall's Web-Based Training Cookbook (Driscoll, 1998; Hall, 1997).

The project milestones are predicated on one year of further definition and development prior to establishing mandatory participation in MARS DL. The schedule presented at Figure 4 is based on commencing the definition study September 2000 with the first course on-line for training in September 2001. The proposal of the fall commencement date of the definition study is a result of the heavy summer training period where members of the NTPAG would not be available for project duties.

1. Determine your needs up front.

The first step is to establish a cross-functional team. This team, New Training Paradigm Advisor Group (NTPAG), was established in January 2000. This group is made up of representatives from all departments within the school: MARS, Navigation, Standards, Technical, IT, Administration and is chaired by the author of this paper. This group has been used to conduct an in-depth training needs-analysis.

The NTPAG has confirmed the findings of the author as presented in Chapters 1 and 2. There is too much training material to be covered within the summer training period of the naval reserve officers. As well, as demonstrated by the ADVISOR 3.0 analysis of the MARS curriculum, EOs are not being presented to the students in the most effective training manner. These two findings have focused the NTPAG to investigate alternate training methods.

2. Look to distance learning as a way to revitalise and innovate the existing training program.

The current course development and traditional F2F classroom instructional methodology incorporate sound, comprehensive design and delivery principles. By bringing the training to the learner outside the traditional classroom redesign of the courseware is required. It is essential that courses be designed specifically for the medium that will carry the training. Judicious use of the capabilities of multimedia presentations via the Intra/Internet could add an "edutainment" component to the training. As well, the incorporation of the ARCS principles into the course design will enhance the delivery of the training and motivates the learner to preserve with the training to successful completion.

In order to address the challenges identified at VENTURE it is intended to review the results from the ADVISOR 3.0 analysis of the MARS curriculum and the current sequence of delivery for each of the EOs. Those EOs that are deemed appropriate for learning at distance will then be organised into a conversion sequence in order of priority. Appropriateness will be determined by the advice provided by ADVISOR 3.0, the requirement for the student to learn the material without having prior knowledge of MARS 2 modules and for MARS 3 and 4 modules that focus on a cognitive learning requirement, such as rules and regulations. Other issues that will be considered will be stability of the material, ease of conversion and costs. To achieve this goal it is recommended that a consultant be retained.

3. Start using a multilevel evaluation approach.

As the project progresses students and instructors will be incorporated into the design and development phases to ensure the needs of the end users are being satisfied and to add a degree of quality assurance. Through their input on courseware design and feedback on the implementation of pilot courses, conducted within the school confines but at distance, courses will be groomed and infrastructure will be developed to support a national DL program. This process commenced in the summer 1999 with the testing of

the first six Web-based training courses. Comments from students and staff were extremely positive as both groups found the material presented supported and enhanced the material instructed in the classroom. Students who were unable to grasp the theory in the class reported success in learning the material after completing the Web-based pilot courses. Course critiques and the established verification and validation process will be utilised to ensure relevance of the material being instructed.

National representation will be sought once design concept options have been developed. There are initiatives underway at the Headquarter level addressing the training challenges at a national level similar to those being experienced at VENTURE. As part of the outside support systems analysis for the DL modules developed by VENTURE this national project team will be engaged through the project sponsor's organisation.

In support of this multilevel evaluation approach it is recommended that non-training solutions to the current training challenges be explored. Such activities as reviewing the appropriateness of the current standard of training, use of Electronic Personal Support Systems and, with respect to training instructors to perform within the technical environment of DL, hire civilian staff or contract out that portion of the training. Other training solutions that are worthy of consideration are partnering with the USN or other allied navy in DL development, delivery, and maintenance. Adopt a "Smart Ship" approach where students progress their MARS training at sea via CD-ROM, embedded training modules found in on board EPSS and satellite communications. All these possibilities will be investigated by the NTPAG during the fall 2000 with the assistance of the hired consultant required for Phase 2.

4. Keep the focus on what you are learning, not on the technology that is helping you learn.

Presentation of each enabling module, outside of the current traditional design, will have to conform to the medium in which it will reside. Each medium has specific strengths with respect to delivering training. It is the capitalisation of these strengths that

will enable the learner to better understand the material. The technology selected to support the enabling objective has been identified through the ADVISOR 3.0 analysis process. The final selection of the specific EOs and medium for each objective will be determined by the NTPAG assisted through further analysis conducted by ADVISOR 3.0 and advice from a consultant retained for aforementioned Phase 2.

Prior to the learners conducting the training outside the confines of VENTURE two activities must be completed. The first is an examination of the learning styles of each student. By using Kolb's Learning Style Inventory tool the students will understand their own learning strengths and more importantly weaknesses (Kolb, 1984). By being cognisant of these factors students can learn how to optimise their learning strengths and compensate for their weaknesses. This compensation can take the form of courses and practice. As well, by understanding their learning characteristics naval officers will be able to better prepare themselves for the life of self-study and preparation associated with preparing for command. This awareness of ones metacognitive capabilities is viewed as an essential step to improving the quality of training at VENTURE. Therefore, it is recommended that in order to support all stages of naval officer training and development the Kolb Learning Style Inventory Test be administered to all learners at the commencement of MARS II.

The second activity is to ensure the students are instructed and prepared to learn at distance. It is envisioned that this preparation will consist of instruction and completion of a number of Web-based EOs while they are in residence at the school. During this period the on-sight facilitator will have the opportunity to instruct the students in the use of equipment and procedures and permit the students the ability to develop that sense of confidence that DL is as good a method of training as F2F, if not better. Of the students surveyed 61% have access to the Internet at home and 35% have experienced some type of education or training via the Internet. It is anticipated that both of these numbers will increase throughout the years as access to the Internet becomes more feasible for more families and as more educational and training establishments develop Web-based DL.

5. Market your distance learning program internally and externally.

The conceptualisation and progression of DL within VENTURE has been based on a collaborative process with staff and students. The requirement for alternate training delivery methods has been clearly articulated to all staff, both instructors and administrators. Students are consulted on module design issues and are used to beta test web based designed EOs both in house and at distance. Feedback from the beta test is incorporated in updates to the modules. This is viewed as an ongoing process and not bound by the timeline associated with this project.

The requirements for and advantages of DL must be clearly understood by those agencies that are responsible for the professional development and advancement of the learners. The ability to address all the training requirements without the increase of training time is the immediate advantage of this proposal. This communication will continue to be done formally through the different scheduled Working Groups and other training meetings. Students and staff that have had the opportunity to use the alternate delivery of training while at VENTURE will serve as the unofficial source of communication when they return to their reserve units after summer training. Both the success they enjoyed and desire to further pursue DL during the fall and winter months will hopefully serve as a confirmation source for the official reports and recommendations by the school. This to is viewed as an on going requirement exceeding the period of this project.

6. Use on-site co-ordination.

It is essential that the DL support services provide is as good if not better than that support provided though traditional training methods. An on-sight co-ordinator will have to be available during periods when learners are expected to be conducting DL. The period of availability will have to be carefully researched and once decided communicated to the learners and staff when this individual will be available for assistance. Regardless there will be an e-mail address or other means that the learners and staff will be able to get a message to the co-ordinator so that corrective action can be taken when on-sight.

The co-ordinator will be skilled in the use of technology and have the capability to conduct testing of all support equipment prior to the commencement of DL training. For those students conducting DL on-sight the co-ordinator could perform the function of introducing the learners to the technology and be available to address questions and minimises the stress associated with learning in a new environment. The on-sight co-ordinator is viewed as a key member of the implementation team in that his/her ability to place the learner at ease and promote a positive attitude towards DL will contribute to the learner's confidence and desire to continue to pursue DL (Chute et al., 1999).

The on-sight co-ordinator's functions are currently handled as a secondary duty by the school's IT co-ordinator. It is essential that a full time position be established prior to making the DL training mandatory for MARS training. It is envisioned that this position should be established and filled the summer prior to requiring participation of MARS training through DL.

7. Obtain local field manager commitment.

As part of the process of communicating the advantages and values of DL will be to secure commitment from the NRD Commanding Officers to permit access to resources necessary for the learner to participate in the MARS DL program. These resources could be a room with a computer connected to the DIN and time from the weekly division training parade. The Commanding Officer will be the remote on-sight mentor for the learners. By providing the supervision and mentoring the students will be reassured that their development is important and their efforts will benefit the operational capability of his/her unit.

As part of the indoctrination training the learners will be surveyed as to their accessibility to both the Intra and Internet. Ideally all candidates will be able to participate in the training via the NRD's Intranet at no cost to the individual but the school's infrastructure should be developed to permit those who wish to access the training from their home or other Internet locations. This would allow students to access

asynchronous courseware where and when it suits them best while lessening the burden on the NRD.

The issue of recognising the time required to complete DL training will have to be co-ordinated with NAVRESHQ. Each course will have an allotted number of hours that a learner is expected to complete the course in. Once the officer successfully completes the course they will be compensated for their efforts equal to the time allocated to that course. Should the learner take more or less time to complete the training should not affect the amount of remuneration.

8. Make sure the instructors are well trained.

This is without a doubt one of the most critical components for successful implementation of DL within VENTURE. It is essential that the instructors are well trained and practised in the facilitation of DL courses. This attention to developing the instructors followed by the mastering of the skill sets required to perform the duties of an instructor at distance will increase their confidence and hence their motivation to pursue this line of instruction. Care will have to be taken to not only ensure the instructor has the correct subject matter knowledge and training to conduct DL training but also possess the personality and desire to work outside a traditional classroom.

There is a concern that the time necessary to develop the skills and to master the environment for DL could take up to two years. Given the posting cycle for officers within the navy, which could be two to three years, a cost-benefit will have to be conducted during the final proposal as to whether the DL instructors are serving officers or civilian hired subject matter experts. The civilian option should provide a more stable instructor core for DL training and therefore the school should expend fewer funds in developing this capability. This will have to be carefully studied during the definition phase in the fall 2000.

9. Design programs specifically for distance learning.

Courses that are selected for DL will have to be redesigned from the current traditional F2F format. The medium selection assistance provided by ADVISOR 3.0 would be used to identify those courses suitable for conversion to DL format. There exists a host of DL courseware design tools that will tailor the material to the medium selected to carry the training. These tools will guide the developer to maximise the technical capabilities of the medium without sacrificing the balance between human interaction and the courseware. In following this guidance the medium will enhance the learning process.

Throughout the technical design process it is important not to forget the design principles espoused by John Keller in his ARCS model and the model developed by John Carroll. These training principles must be included in the overall courseware design for they address those motivational and functional course design concepts essential for adult learning. This combination of technology and proven training development and delivery practices will provide the best chances for a successful DL program for the navy. This will be an ongoing process as new or improved DL training theories and methods are developed and as the learners of the future evolve VENTURE will be required to update and modify the courseware. These activities must be considered in the courseware maintenance budget.

10. Use reliable equipment.

The final design step to be discussed is focused on the hardware that will support DL. The requirement to have dependable equipment has been proven in all endeavours where man has depended on technology to achieve a desired outcome. This is ever so true with DL especially during the initial start-up phase. The learners and instructors embarking on their maiden voyage in DL will be sceptical about the ability of the technology to support the training. Should the technology falter during the initial phases then the confidence of the learners and instructors in the technology will quickly diminish. Should it persist then the school runs a great risk of losing the enthusiasm and desire of the team to continue to "waste time" on this training methodology.

Therefore it is essential that the DL infrastructure be equipped with dependable and robust equipment supported by a reliable and accessible technical support organisation. VENTURE is currently developing this capability on-sight and experimenting on the Intra/Internet. The school is developing a dependable technical support system while developing a sense of confidence from those participating in the testing process. Problems are quickly solved as the system is still relatively small and failures have been few. It is envisioned that this "crawl before you walk" technical development approach will enhance the possibility of success when DL courses become mandatory for training advancement.

The VENTURE DL system configuration will be identified during the fall 2000 definition phase. The options on hardware and services available necessitate the employment of expert(s) for this task. As well, the results of ongoing national initiatives in this field will also impact the final infrastructure selection. To this end, the researcher determined it imprudent to suggest a favourable school DL infrastructure or provide any costs. Costs will vary greatly from a monthly fee for an organisation to house, deliver, and maintain the courseware to the design, procurement, and administering the DL in-house. A cost-analysis will be conducted on the full range of options. The results of this study must be completed by January 2001.

Project Milestones

The information provided to date is a general outline for VENTURE DL development. The level of knowledge required to provide a detailed implementation plan does not reside within the school and may not reside within the CF. This knowledge is however readily available from experienced experts within industry. It is proposed that the development of the detailed plan that will see the resolution of the training challenge facing officer training in VENTURE be developed in partnership with industry. It is recommended that the definition and development stages commence on completion of the

summer 2000 training period when staff will be available for this endeavour. The following development schedule is therefore proposed:

VENTURE DISTRIBUTED LEARNING DEVELOPMENT SCHEDULE

Phase	Jan-Feb-Mar-Apr-May-Jun-Jul-Aug-Sep-Oct-Nov-Dec-Jan -Feb-Mar-Apr-May-Jun-Jul-Aug-Sep
1 Needs	▲----▲
2 Options	▲---▲
3 Review	▲----------▲
4 Focus	▲----------▲
5 Comms	▲----------
6 Co-ord	▲
7 Buy-in	▲----------▲
8 Staff	▲
9 Design	▲----------
10 Tools	▲----------▲

Figure 3.

Closing Statement

This project was generated to address three challenges facing naval officer training at VENTURE NOTC. These are, insufficient time to instruct an ever increasing curriculum restricted by a stagnate operating budget. Added to these challenges is the lack of throughput to address the shortage of trained MARS officers in the Fleet. The shortage of naval officers is, for the most part, a result of influences outside the control of VENTURE, such as ineffective recruiting, unattractive QOL and a thriving economy to name a few. It is possible that those students not successful in their initial MARS training may have fallen victim to the traditional instructor-centred naval training approach.

This paper attempted to demonstrate that there is a requirement to change the approach of training at VENTURE to a learner-centred one. In adopting this approach it is anticipated that the student's learning will be more effective therefore increasing the number of MARS officers graduating from the school. This learner-centred approach will be supported by alternate learning methods. These methods will permit the student to access all training anytime while they are in residence and selected enabling objective at distance from the school. By developing a self-paced and self-regulated learning style future naval officers will be better prepared to tackle the perpetual self-studying requirements for command examination preparations and other mandated self-study training.

The speed at which these initiative will be developed will be predicated on the following:

- the availability of funds;
- development of courseware and infrastructure;
- development of DL facilitators/instructors; and,
- training of students to learn at distance.

The aforementioned factors does not represent a linear progression as the development of courseware and hardware will happen concurrently with the efforts to prepare both the students and staff.

It must also be understood that the solutions presented in this paper only address those issues within the direct influence of VENTURE. While success in these school initiatives will address some of the challenges facing the navy, efforts must continue to address those specific external issues affecting the morale and number of naval officers.

The research and proposal presented in this report will address two of the three major challenges confronting naval officer training at VENTURE, too much training in too little time. In order to develop the solution it is necessary to identify the funds for project definition. It is anticipated that the consultant required for Phases 2, 3, 4 and 8 this fall would demand a fee that is in the vicinity of $20,000. Should these funds not be available then the NTPAG will continue to develop the project to the extent possible without the expertise from industry.

DL represents a technologically advanced alternative to traditional classroom instruction. The proven and sound training practices must be developed into the DL modules. As stated by Margaret Driscoll about technology and learning, "It is too easy to be caught up in the hype and hoopla of the technology and to lose sight of designing effective training. ... It is a means to an end, not an end in itself. It is our role to be advocates for the learner and to apply the principles of adult education and instructional design to Web-based training." (Driscoll, 1998, p. 234).

CHAPTER SEVEN

REFLECTIONS

The Beginning

The opportunity to attend the Master of Arts in Leadership and Training presented itself in the spring of 1998. Discussions began between my sponsor and Royal Roads University (RRU) concluding with acceptance into the MALT 98-1 program. Preparations were made for this learning journey both at home and at work. Preparations included the establishment of a work area at home plus discussions on expectations and commitment from my family and myself. We discussed my involvement or should I say the lack of my involvement in the family unit while progressing this academic pursuit. At work preparations centred on ensuring my second in command was prepared to run the Naval Officers Training Centre in my absence during the two five week residences. After a short period of time I was off to RRU in pursuit of higher education.

As I commenced this voyage I experienced two strong emotions. First was a sense of joy and elation that I was finally going to achieve a life long goal of a university degree. For years I lived with the knowledge that I was in a profession where the majority of my peers were undergraduates and graduates. I lived with the sense that I would never achieve true equality with them until I had proven myself an academic equal. The second emotion was a sense that I was not worthy of attending this degree program. This was similar to the apprehensions experienced within my professional life.

The residences were a holiday from the everyday cares and worries of my professional and family world. The environment provided at RRU permitted me to focus completely on the busy of learning. The cerebral workout was magnificent. The talent resident in the staff and fellow learners was at times overwhelming. The interaction provoked by the exercises during the summer residencies required many of us, myself included, to venture to different parts of our makeup, explore feelings and inner thoughts

and then share these with fellow learners. The journey of self-exploration was not always an enjoyable journey but the value both to my MALT friends and myself is becoming more evident every day. My regret is that I did not take the opportunity to live-in so that I could have maximised this portion of the MALT experience.

The strength of the course is in the people. The faculty and support staff made the transition from one seeking knowledge to one possessing some new knowledge enjoyable and interesting. The different perspectives and experiences provided a rich field in which to harvest the seeds of knowledge. The diversity of backgrounds of the learners, both professional and educational, provided the fertile field in which to sow the seeds provided by the faculty. The trusting and safe environment at RRU allowed the learners the opportunity to share and participate fully in all activities. The respect for each person's uniqueness enriched the learning experience. As a result of this learning rich experience I have grown measurably in knowledge and self worth and have developed life long friends I have not experienced outside of the military.

The Middle

The learning experience outside the residency periods was truly an experience in every sense of the word. As I had never participated in Distance Learning the first DL semester was a real voyage of discovery. Having to work in an environment without the physical support from peers and faculty was a difficult learning experience. It took the first half of the first DL session before I was comfortable learning in this new environment. What I did not appreciate at that time is my final project has a component of DL requirements. The experience I gained from living through the DL experience was invaluable in understanding the challenges of establishing a DL environment.

A key component for success of the DL sessions was the outstanding support provided by the faculty and information technology team. At no time did I feel that I was alone. Feedback from faculty was usually prompt and relevant. The IT Centre displayed

exceptional knowledge of the DL environment and were extremely patient. This support again supplied me invaluable experiences for the future.

The Finale

The final project indeed turned out to be the most challenging leg of the MALT journey. From the selection of the project topic to the development of the prospectus and proposal the professional and moral support from the RRU team, my friends, and family was outstanding and absolutely necessary. At times confusion and then frustration clouded the way ahead but after discussing the problems with peers and faculty I was able to regain my footing and progress to the next project step. It must be said at this time that the learning curve throughout the two years was steep but enjoyable. At the end of the second residency the focus narrowed to the final project and the project team.

At the start of the second residency we were informed that the selection of ones project supervisor is an important if not critical step to achieving success. At the time I did not believe this was so however I heeded the advise of those wiser than me and worked hard to find a supervisor who had the knowledge and personality attributes to guide me through the rocky shoals of thesis development. Dr Roger Powley proved to be this individual and more. He provided me with sound advise, clear direction, moral and spiritual support and when needed a kick in the pants. He had the ability to sense when things were not going well and was able to deflate the problem by applying his wealth of knowledge and experience to my problems. Dr. Powley provided the advice and clues, the application of knowledge and how that was gained was always left up to me. I can not begin to explain how many sleepless nights and waking hours I spent on figuring out a problem. This difficult yet essential component of my thesis development caused me to use every bit of knowledge I gained at RRU and from my professional experiences. This included mustering up the motivation to continue when the end was not in sight while motivating my team to work long hard hours to produce the best advise possible. As well, continually referring to course notes and books for that one reference that would tie a thought together. These were but a few of the challenges experienced this year.

Throughout the gnashing of teeth and fits of depression my family and project supervisor never gave up on me or on my ability to succeed. They were able to observe my knowledge growing while I was buried under tons of reference material and books. They keep throwing me a lifeline every time I flounder in self-doubt and despair.

The Beginning

As I neared the end of the thesis journey I have come to the conclusion that while the thesis represents the tangible final product the true learning happened along the way, throughout the two years. My confidence in my self and my new knowledge is sound. I realise more than ever what I don't know or understand. I welcome the continuance of my life long learning journey. I am thankful to those who have developed in me my thirst to learn, to share what I know and what I experienced. In my opinion this is the true meaning of the MALT learning experience.

GLOSSARY OF TERMS

ADL	Advanced Distance Learning
AI	Artificial Intelligence
CofC I	Certificate of Competency Level 1
CofC II	Certificate of Competency Level 2
CBI	Computer-Based Instruction
CBT	Computer Based Training
CCA	Curriculum Control Authority
CF	Canadian Forces
CFITES	Canadian Forces Individual Training and Education System
COTS	Commercial off the Shelf
CMC	Computer Mediated Communications
CMS	Chief of the Maritime Staff
DND	Department of National Defence
DNPP	Director of Naval Personnel Production
DT	Distributed Training
EPSS	Electronic Personal Support System
F2F	Face to Face
FRP	Force Reduction Programme
IT	Information Technology
MARS	Maritime Service
NABS	Navigation and Bridge Simulator

NTPAG	New Training Paradigm Advisory Group
NOTC	Naval Officers Training Centre
PC	Personal Computer
QOL	Quality of Life
ROI	Return on Investment
RRU	Royal Roads University
SME	Subject Matter Experts
TE	Training Establishments
UN	United Nations
USAF	United States Air Force
USN	United States Navy
WBT	Web-Based Training

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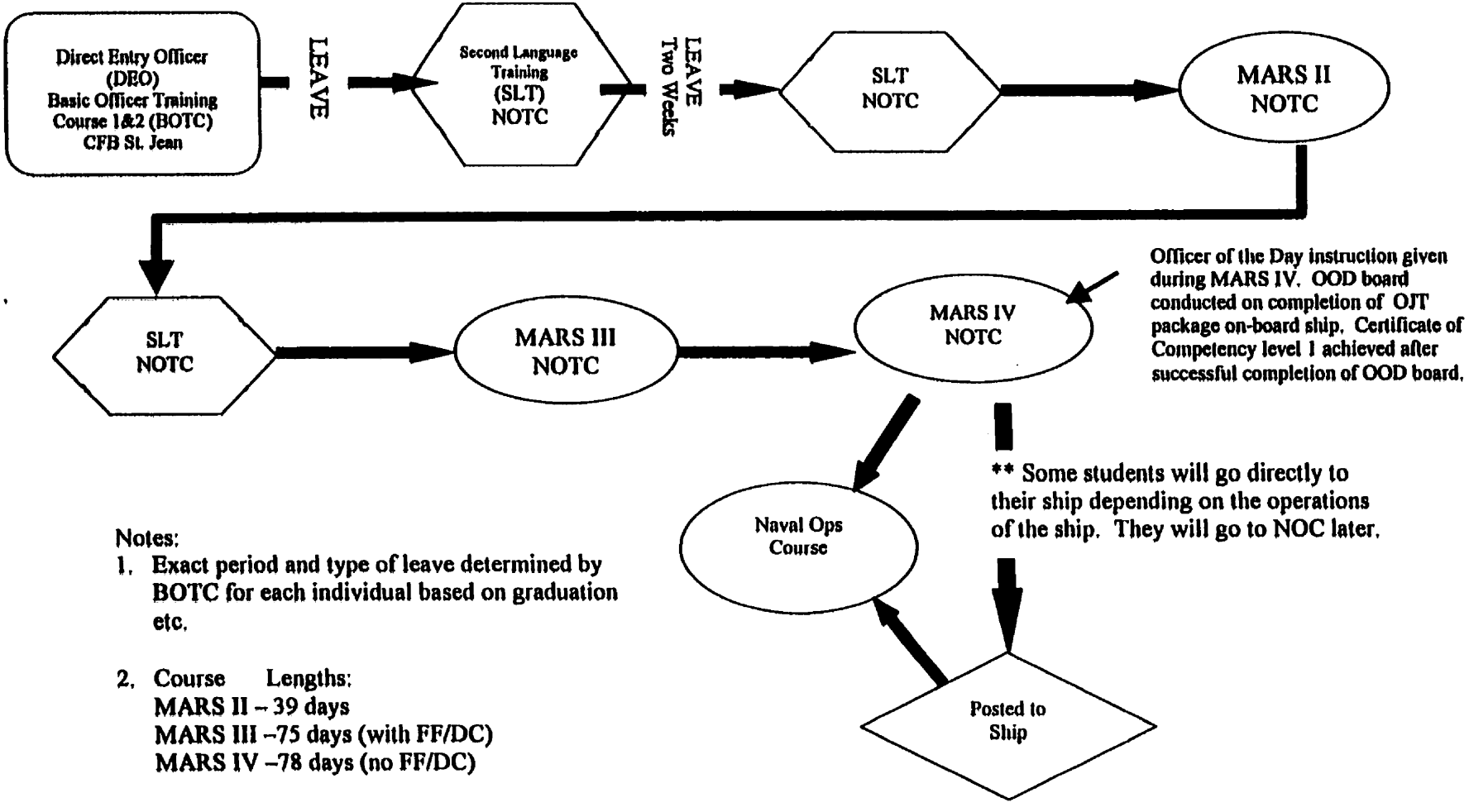
APPENDIX A

MARS TRAINING PROGRESSION

Training Progression for MARS DEO/CFR Candidates

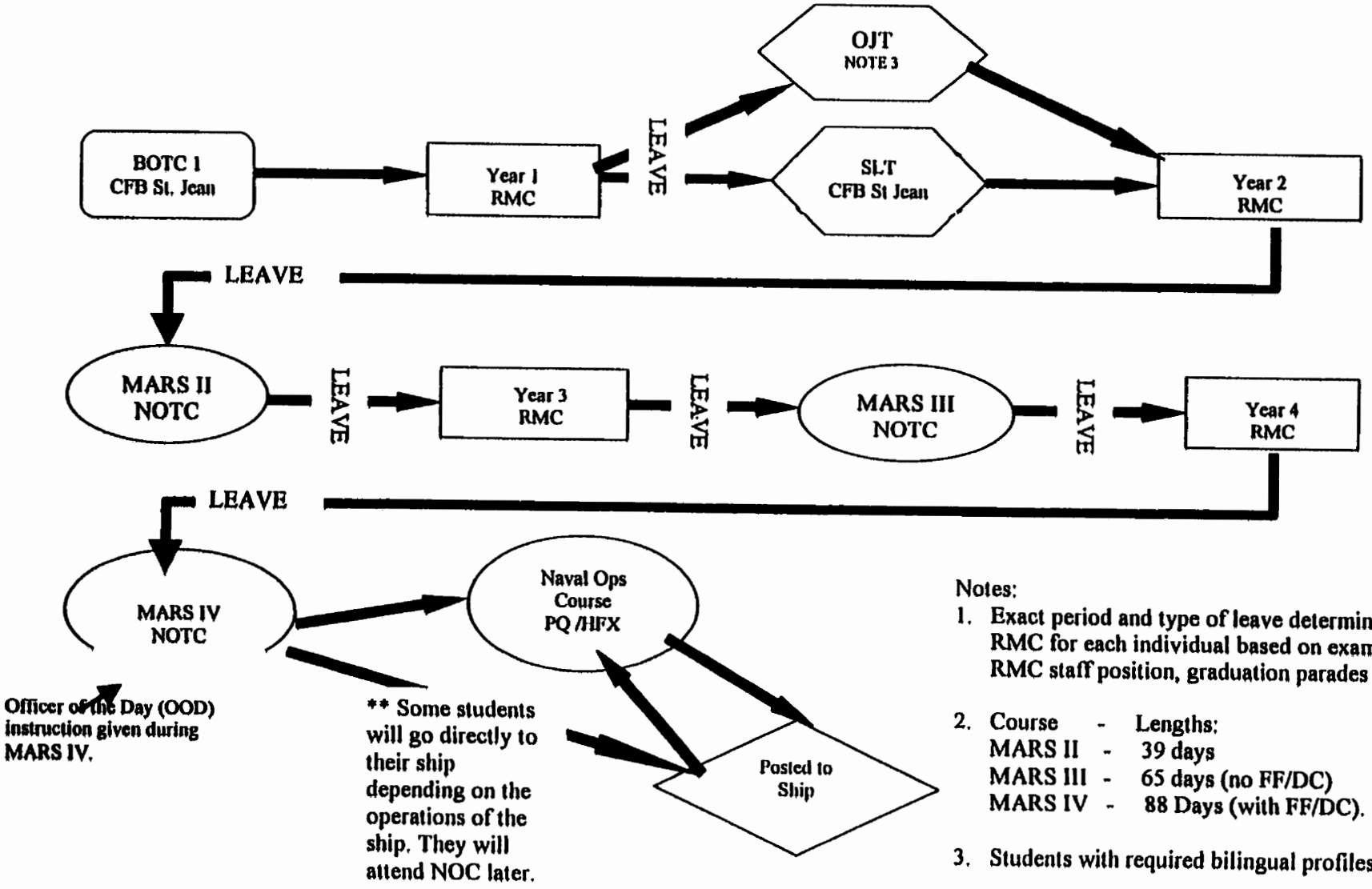


Notes:

1. Exact period and type of leave determined by BOTC for each individual based on graduation etc.

2. Course Lengths:
   MARS II – 39 days
   MARS III –75 days (with FF/DC)
   MARS IV –78 days (no FF/DC)

Training Progression for MARS ROTP Candidates



Notes:

1. Exact period and type of leave determined by RMC for each individual based on exam rewrites, RMC staff position, graduation parades etc.

2. Course - Lengths:
   MARS II - 39 days
   MARS III - 65 days (no FF/DC)
   MARS IV - 88 Days (with FF/DC).

3. Students with required bilingual profiles.

APPENDIX B

ARCS MODEL

Motivational Categories of the ARCS Model

Categories & Subcategories	Process Questions
Attention	
A.1. Perceptual Arousal	* What can I do to capture their interests?
A.2. Inquiry Arousal	* How can I stimulate an attitude of inquiry?
A.3. Variability	* How can I maintain their attention?
Relevance	
B.1. Goal Orientation	* How can I best meet my learner's needs? (Do I know their needs?)
B.2. Motive Matching	* How and when can I provide my learners with appropriate choices, responsibilities, and influences?
B.3. Familiarity	* How can I tie the instruction to the learner's experiences?
Confidence	
C.1. Learning Requirements	* How can I assist in building a positive expectation for success?
C.2. Success Opportunities	* How will the learning experience support or enhance the students beliefs in their competence?
C.3. Personal Control	• How will the learners clearly know their success is based on their efforts and abilities?
Satisfaction	
S.1. Natural Consequences	* How can I provide meaningful opportunities for learners to use their newly acquired knowledge/skills?
S.2. Positive Consequences	* What will provide reinforcement to the learners successes?
S.3. Equity	* How can I assist the students in anchoring a positive feeling about their accomplishments?

APPENDIX C

MEDIA OPTIONS

MEDIA OPTIONS

TRADITIONAL TRAINING DELIVERY METHOD

1. Traditional training delivery methods, commonly referred to as classroom training, refer to instructor led learning situations that involve groups of learners in places designated for instructional activity, usually in a centralised location such as a school, that is separate from the workplace. Conventional media such as chalkboards, printed materials (e.g., books and course notes) and audio-visual devices (e.g., overhead transparencies, film, slide-tapes) are used to deliver training. Practical exercises/experience, that may include some hands-on training, also play an important role in this delivery method with real items or their models used as instructional media.

a. Advantages

(1) The "classroom" can be anywhere, allowing instruction to be close to the place where the task is to be performed;

(2) the size of group receiving instruction can vary; it is not dependent on equipment;

(3) the instructor provides feedback on learner progress;

(4) instructor may modify the sequence or the presentation of material;

(5) development time for instructional materials is comparatively short with a ratio of 20:1 (i.e., approximately 20 hours of instructional development to produce one-hour instruction if simple media are used);

(6) instructional materials can be readily changed or updated; and

(7) interaction between instructor and other students can be a significant factor in learning.

b. Disadvantages

(1) Quality of instruction varies greatly due to instructor quality;

(2) standard of instruction is difficult to maintain;

(3) content is hard to control;

(4) little attention is paid to learner learning style or attention span;

(5) the instructor sets pace of instruction with lock step instruction for all learners;

(6) the scheduling of instruction is fixed; and

(7) delivery method is fixed.

c. Costs and Benefits The costs incurred with traditional training delivery methods are varied. Although the initial cost of the development of course materials is relatively low, other costs incurred in the delivery of the instruction can be very high, especially when students must travel to a central training. These costs can include travel and accommodation costs for the learners and instructors, temporary duty costs, overhead training facility costs, costs for support services and equipment, and printed course materials. Instructor preparation time, delivery time and reproduction of course materials are required for each serial. As a result, the costs of presenting training continue to accumulate. However, when a course is going to be delivered to a large group of people over a relatively short period of time, instructional materials can be developed and delivered cost-effectively.

ALTERNATIVE TRAINING MEDIA.

PAPER-BASED TRAINING MATERIALS

2. Paper-based training materials usually travel by mail to the students. Visual attractiveness and clarity are essential in print materials to ensure effective learning. Students and instructors commonly interact via telephone, although computers and FAX are also commonly used. Students are regularly evaluated by written assignments that are either mailed or, more recently, down loaded via FAX or computer to the instructional institution.

a. Advantages

(1) Able to reach a mass audience in a short-time;

(2) inexpensive to develop (relative to other electronic delivery methods, but on par with audio-tape and teleconferencing);

(3) when used as the only delivery method, it is ideal for teaching lower cognitive skills (e.g., learning basic facts, concepts and rules), but poor for higher cognitive skills (e.g., rule using, problem solving and developing cognitive strategies) and motor skill development; and

(4) learning may be either linear or branched to allow for enrichment or remediation.

b. Disadvantages

(1) Passive delivery with no interaction between students and instructors when not used with other media or in conjunction with different types of student-instructor communications hardware; and

(2) dependent on trainees' ability to read and comprehend.

c. Costs and Benefits Although the materials may be inexpensive to develop, the costs to reproduce course materials contribute to ever increasing implementation costs. The revision of course material can be a significant cost and present configuration management challenges. Training instructors who require special skills to develop paper-based training materials must be factored into the costs for this medium.

VIDEOCONFERENCING

3. Videoconferences are delivered via satellite, local cable networks and telephone lines to students in remote sites. Videoconferences can be one way interactive (i.e., the instructor cannot see the students but can communicate with them) or two way interactive (i.e., teacher and students can see and hear one another). Students are usually evaluated by written assignments mailed to the instructors; when audiences are small, students may be evaluated verbally on line. There are three basic types of videoconferencing equipment:

(i) Desktop videoconferencing systems consist of a miniature camera, linked with a computer system, modem and telephone switch. It is possible to

interact with up to four individuals per audio conference. Each system costs between $20,000 to $30,000 per site;

(ii) Roll Around Systems can involve a large number of sites with moderately sized audiences. Each system costs between $50,000 to $100,000 per site; and

(iii) high technology videoconference classrooms that act as the originating site can cost between $130,000 and $200,000 to establish. The cost of establishing a classroom to receive videoconference lessons with two way telephone links, FAX and slow scan television is about $25,000 US per site.

a. Advantages.

Videoconferencing is an appropriate media for topics that encourage individual interpretation, stimulate creative thinking, demonstrating a process or procedure, requires modelling or requires distance students to synthesise materials. The media characteristics of videoconferencing are very similar to educational television except that videoconferencing does not have to be tied to any specific schedule, students have some involvement in the control of learning and learning is interactive rather than passive.

b. Disadvantages

(1) Requires specialised expertise to implement and manage a videoconference course and the interactive approach;

(2) number of students will be determined by the amount of interaction and feedback programmed into the course(s); and

(3) requires a large audience to make it cost effective (this is at odds with the interaction and feedback requirement).

TELECONFERENCING

6. Teleconferencing is delivered to students using telephone lines, high-frequency radio waves, microwaves or satellite and a two-way speaker system. Both students and instructors can initiate interactive discussions. Principal delivery modes include audio and audio graphic (audio plus graphics). Teleconferencing promotes student discussion

on issues and topics, clarifies difficulties in course material, analyses problems, presents case studies, allows role-playing exercises, identifies and clarifies concepts, interpret data. Students can be evaluated verbally, over the telephone or via mailed written assignments.

a. Advantages

(1) Technology is familiar and accessible to trainees and instructors;

(2) allows for instantaneous feedback;

(3) provides for interaction between students and instructors, reducing feelings of isolation;

(4) inexpensive and easy to prepare; in many cases, it is cheaper and faster to prepare than paper-based distance materials;

(5) does not rely on student reading comprehension;

(6) allows flexibility of student tele-linked groupings and the time of presentation;

(7) allows the use of guest speakers or subject matter experts to enhance, reinforce or provide remedial assistance to students;

(8) allows distance students to be linked to existing in-house training programs (when visual cues are not important to learning);

(9) limited in application to a small numbers of students at a time so that interactive discussion can be maintained; and

(10) when used in conjunction with a computer link (e.g., audio-graphic techniques), graphics and photo stills can be used to enhance instructions.

b. Disadvantage Teleconferencing is not appropriate for lectures, groups where membership is constantly changing, instruction that is dependent on large numbers of visual cues, or conveying lengthy procedures/instructions.

c. Costs The cost of establishing a four-studio production facility with a control station and bridge is approximately $65K. Each receiver site costs approximately $2K to establish.

COMPUTER CONFERENCING

7. Computer conferencing is a new technology increasingly used in education and training environments. It has been primarily used to augment instruction delivered in another media, but in some cases, such as short seminars/discussion groups, instructions had been facilitated through the use of Computer-Mediated Communications (CMCs). Instruction is achieved through a series of computers with modems linked via telephone line. Individuals communicate through Bulletin Board Services (BBS), E-mail or some other communications software package.

a. Advantages

(1) Allows the use of other computer applications software and database files;

(2) graphics can be included in the presentations; and

(3) with the right software, student involvement and responses can be tracked and filed for future analysis.

b. Disadvantages

(1) Only a small numbers of students can participate at one time;

(2) requires specialised hardware and software;

(3) students and instructors must be familiar with the technology;

(4) relies heavily on the student reading comprehension and typing ability; and

(5) the pace of instruction/discussion can be slow as only one person at a time can communicate data/information.

c. Costs Varied.

COMPUTER-BASED TRAINING

8. Computer-based training (CBT) refers to individualised interactive instruction provided to the learner via a personal computer (PC) that provides stimulus to the learner, analyses responses and provides immediate feedback. The PC can be hooked to a wide area network via modem or individual lessons/assignments on floppy disks can be mailed

to students on a regular basis. Instruction ranges from very simple tutorial instruction, similar to that used in programmed learning, to complex instruction characterised by sophisticated, almost human, feedback developed using artificial intelligence (AI) techniques. Student evaluation methods are often embedded in the courseware. CBT can be, and most often is, developed as a discrete, standalone block of instruction. However, it can also be incorporated effectively into computer programs that are not primarily designed as instructional, but that require an instructional component.

a. Advantages

(1) Self-paced learning;

(2) immediate feedback;

(3) branching to suit learner (adapts instruction to suit the needs of the learner);

(4) consistency of instruction;

(5) interactivity (very important factor in learning);

(6) helps standardise training;

(7) enables learner to remain in own environment, making CBT a good candidate for distributed learning;

(8) supports use of multimedia (audio and video);

(9) can be used at learner's convenience;

(10) decreases learning time;

(11) motivates learners (learners are often interested in practising more frequently); and

(12) substantially reduces need for instructors and teaching assistants.

b. Disadvantages

(1) Fixed sequence of modules;

(2) pre-structured activities; menu-driven;

(3) development costs are high although becoming more competitive (research suggests CBT development time ranges between 50-500 hrs for one hour of instruction and averages 200-300 hrs);

(4) no development short cuts are available; courseware must be well designed, developed and evaluated if effective instruction is to be provided;

(5) relatively high hardware costs, although becoming more competitive;

(6) adding complex feedback may significantly increase development costs;

(7) learner isolation unless tutorial help is available; and

(8) instructors require specialised skills to design courseware and operate in a computer-training environment.

c. Costs and Benefits The front-end development costs for CBT, like those for most technological media, are high. As indicated, development time varies. Much depends on the capabilities of the developer and the complexity of the program being developed. However, CBT is cost-effective when used appropriately. Also, the greater the number of students, the more cost-effective the CBT. Delivery costs drop rapidly once the development has been completed.

d. Development Personnel Research suggests that successful CBT implementation is largely dependent on creating a developmental team with suitable technical and subject matter expertise:

(1) Instructional designers with extensive ISD and CBT backgrounds;

(2) ISD training technicians with authoring language experience;

(3) programmers with authoring language experience;

(4) imaging experts with scanning, graphics and authoring experience;

(5) graphic artists (if possible); and

(6) SMEs assigned locally (if possible).

COMPACT DISC INTERACTIVE

9. Compact Disc Interactive (CD-I) is a CD-ROM based, self-contained system that can easily plug into any TV set and most monitors; it uses a simple handset to display interactive stills and full screen, full motion clips. CD-I is an international technology standard being promoted primarily by Philips and Sony.

a. Advantages CD-I has the advantages of other self-instructional systems:

(1) Learner control of instruction (done when convenient);

(2) self-pacing;

(3) consistency of instruction;

(4) interactivity (user interface);

(5) immediate feedback;

(6) mastery of learning possible;

(7) capability of accommodating different learning styles;

CD-I has the following additional advantages:

(8) provides cost-effective delivery for CBT (cost of production and development continue to decrease);

(9) offers high quality motion video and graphics;

(10) has large storage capacity of CD-ROM;

(11) is a robust medium (i.e., trainee-proof);

(12) is a crash resistant medium;

(13) is write protected;

(14) provides easy delivery; and

(15) is portable.

b. Disadvantages

(1) Up-front development costs are high (e.g., cost of gathering images is the same as for video discs, but the added step of converting to a digital format must be factored in); and

(2) record keeping can present difficulties (e.g., files cannot be written to a read-only device. Student records must be kept on the resident hard disc, a floppy disc or a network file server).

c. Costs and Benefits The high front-end cost of development is offset by a delivery mechanism that is versatile, flexible and portable. Its cost-effectiveness is particularly apparent when large numbers of learners in scattered locations are involved.

INTERACTIVE VIDEO DISK

10. Interactive Videodisk (IVD) training is self-paced interactive training delivered to students via a PC, videodisk player and monitor. Much like CBT, the majority of interaction is between the system and the students and evaluation is often embedded in the courseware. The media characteristics of IVD are the same as CBT and include:

a. Advantages

(1) Provide realistic images, motion (slow, normal and fast) and stereo quality audio at the same time;

(2) highlight critical characteristics of video segments; and

(3) fast search, zoom and supplement video segments.

b. Disadvantages

(1) Instructors require specialised skills to design IVD courseware;

(2) students may require more time to complete the instruction;

(3) requires expensive and specialised hardware; and

(4) students required specialised skills to operate the hardware.

c. Costs Varied.

ELECTRONIC PERFORMANCE SUPPORT SYSTEMS

11. An Electronic Performance Support System (EPSS) has been described as incorporating "computer-based training, interactive instruction, detailed job procedures, reference and help materials and expert systems diagnostics in one system. It provides both operational job support and performance development when and where it is needed". In that context, EPSS might be described as a system that includes, but is not limited to, training and the emphasis shifts from "training as an event" to "performance on the job." As an integral part of the operating system, EPSS should neither degrade that system nor create downtime on it.

a. Advantages

(1) Does not interfere with the host application;

(2) is available on demand, in context, while worker performs job;

(3) reduces need for traditional training methods (formal classroom training);

(4) reduces learning time because learner can access information required on demand;

(5) supports training to need;

(6) increases productivity;

(7) contains various support mechanisms online, such as job aids, reference materials, interactive tutorials, expert system diagnostics and organisational policies and procedures;

(8) allows materials to be updated quickly and easily;

(9) supports interactive CBT capability to create on-line user training;

(10) supports use of multimedia;

(11) motivates learners; motivation to learn is much greater when a worker can see how technology can be applied to make the job easier or more efficient;

(12) includes capability for monitoring of user performance;

Research indicates specific benefits of EPSS include:

(13) decreases training time (20-50%);

(14) decreases training delivery travel and personnel costs (30-100%);

(15) increases retention (16%);

(16) decreases paper documentation (33%);

(17) decreases documentation reading time (20-40%);

(18) increases productivity (25%); and

(19) empowers employees with the tools they need to be productive.

b. Disadvantages The disadvantages are primarily those associated with introducing change and implementing a new technology:

(1) Gaining sponsorship for EPSS (i.e., obtaining adequate commitment and support from the upper echelons of the organisation);

(2) developing an EPSS that will adequately address the business needs of the organisation;

(3) providing competent project management capable of introducing change systematically; and

(4) overcoming resistance to change.

c. Simulation: A Type of EPSS. EPSS solutions are typically developed to support large computer user populations (e.g., 100+ users) who perform a specific function for an organisation. EPSSs may be developed as part of a software application's source code or they can be developed using "Commercial Off the Shelf" (COTS) authoring products. COTS authoring systems are currently available to create simulations that have the following characteristics:

(1) Simulations that can be integrated directly into an application as a menu item in order to provide just-in-time training on demand. This allows trainees to remain at their workstations while being trained and learn using actual applications and machines;

(2) simulations are created by the authoring system that mimics the application as the developer runs it and automatically creates a controlled simulation which runs as a stand-alone lesson;

(3) users are guided step-by-step with popup windows as they perform all of the operations of the real application. Similarly, they receive help whenever they need it automatically;

(4) users may "fast-forward"' or "reverse" the lesson to review or skip a section;

(5) demonstrations can be either free-running or interactive; and

(6) they look and feel like the real application.

d. Costs and Benefits EPSSs greatest advantage over traditional delivery methods is that workers learn while doing the job rather than having to learn as a precondition to doing the job. Being able to use a prime system as a training vehicle enhances both learning and performance. By incorporating much of the training process into the software application, EPSS can reduce formal training requirements, and thus training costs, dramatically. Nevertheless, the cost of EPSS varies significantly based on complexity, the computer platform on which it is based and the extent of development, implementation and support services required. Although initial development costs are high, EPSS eliminates the higher costs of training time and training resources, and overhead costs (transportation, accommodation, temporary duty costs) associated with instructor-led courses. Similarly, use of the prime system as a training approach, without having to purchase additional stand-alone devices, contributes to EPSS cost-effectiveness.

DISTRIBUTED TRAINING

12. Distributed Training (DT) can be defined as "the process by which training establishments develop, manage and evaluate the individual training requirements of widely dispersed operational units".

a. Characteristics

(1) Physical separation of TE instructors and students;

(2) formal arrangements to facilitate regular two-way communications between the TE instructors and DT students; and

(3) DT development, implementation, management and evaluation by TEs and conduct by field units in accordance with:

(a) CFITES principles and procedures;

(b) the principles of distance and adult learning; and

(c) clearly defined media selection guidelines.

b. Advantages

(1) Individual time required to complete a training program is reduced because trainees work at their own pace;

(2) travelling time to, from and/or at TEs considerably reduced or completely eliminated;

(3) training is proactive; TEs can be completed when an individual requires it, rather than when a TE can provide it;

(4) training program content, delivery and evaluation standardised through the effective application of self-paced learning principles;

(5) the length of in-house TE courses can be reduced when programs are designed to include a DT package before or after in-house delivery; and

(6) if properly implemented, DT approaches should eventually reduce naval IT&E costs.

c. Disadvantages

(1) The role of individuals within TEs must change from being deliverers of group-based instruction to developers, managers and evaluators of self-paced DT packages;

(2) additional personnel and resources will be required to convert from group-based to self-paced delivery;

(3) the initial development of electronic delivery is more costly than traditional delivery;

(4) formative/summative evaluations are more difficult to conduct at a distance; and

(5) DT methods are dependent on individual reading and writing skills.

d. Costs and Benefits Costs and benefits are directly related to the media chosen.

APPENDIX D

LETTER OF TRANSMITTAL

Memorandum

NOTC: 1000-0 (Commanding Officer)

11 Jan 00

Dist List

INSTRUCTOR AND STUDENT SURVEY

1. As part of the requirement for an MA in Leadership and Training, I am conducting a survey of instructor and students reactions to the use of technology in MARS officer training. You have been selected as a participant in the study. The Director of Navy Personnel Production (DNPP) in Ottawa has granted approval for your participation in the study. The answers you provide will be used to develop a plan for improve the quality of training at NOTC and at distance through the use of technology.

2. I would request that you complete the attached questionnaire and return it to the ship's office. Recognising the constraints faced during your training, the questionnaire has been designed to require only 30 minutes of your time.

3. The information collected by this questionnaire is strictly confidential. Once completed, the survey will be classified PROTECTED B. Furthermore, the results will report only trends and frequencies. Please do not identify yourself in any way on the questionnaire.

4. If you have any questions regarding the questionnaire or research, you can contact my Thesis Supervisor, Dr. Roger Powley at 881-1923, or myself at my office in the Nixon Building. My telephone number is 3-0883.

M.R. Bellows
Commander
Commanding Officer
3-0883

Dist List

All Students
All Instructors

APPENDIX E

RESEARCH CONSENT FORM

Research Consent Form - Royal Roads University

Research Project: A study into how VENTURE can incorporate increases in training without increasing the training times or budgets.

Investigator: Cdr. M.R. Bellows, Commanding Officer, VENTURE NOTC

Funding Agency: Director Naval Personnel Production, National Defence Headquarters, Ont.

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research project is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take time to read this carefully and to understand any accompanying information.

Purpose of the Research Project

This research is designed to gather information on how VENTURE currently instructs MARS officers. Specifically, the research will focus on how VENTURE employs adult learning theories and established training design tools and how the use of technology is assisting in the training of officers. The results of this project will be used to identify ways of improving naval officer training both in-house and at distance form the school.

Experimental Procedures

All of the information required from you will be obtained through the use of the questionnaire attached. You will be asked specific questions about the methods used in your training and your reactions to it. All of this information is confidential and classified PROTECTED B on completion of the survey.

Participants Requirements

To participate in this survey, you are asked to complete the attached questionnaire. It should take you approximately 20-30 minutes of your time. Most of the questions require a yes or no answer, but some do ask for a brief explanation. You are not required to answer all the questions, but your complete participation will enhance data collection and could lead to improvements in the calibre of training at VENTURE.

Confidentiality Procedures

Like all personal data collected in the CF, this information is classified PROTECTED B and subject to all normal rules and regulations regarding storage and dissemination. Upon completion of the research project, all questionnaires will be destroyed in accordance with the regulations for the disposal of PROTECTED B materials. Your name is not required on the survey. DO NOT identify yourself in any way on the questionnaire. All the personal data required is for tabulation of results only and is limited to items such as age, rank and gender that can be used to draw comparisons among demographic categories.

Publication of Results

All information obtained form this project will be used to generate a research report for fulfilment of a Graduate Degree in Leadership and Training at Royal Roads University. Selected results will be included in the study and a copy made available to VENTURE, and the Department of National Defence Archives in Ottawa. Should you wish t view the final results, you can do so by making a direct request to the author for a copy of this final document. All

costs associated with the preparation of this document will be your responsibility. However, you will be provided free access to the final copy obtained by VENTURE.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this wave your legal right nor release the investigator, sponsor, or involved institution from their legal and professional responsibilities. You are free to withdraw from the study at any time. Your continued participation should be as informed as your initial consent, so you should feel free to ask clarification of new information throughout your participation. If you have further questions concerning matters related to this research please contact:

Cdr M.R. Bellows, Commanding Officer
Telephone: (250) 363-0883
Email: co@notc.esqt.dnd.ca

If you have any questions concerning your participation in this project, you may also contact the officer of the Director of the Organisational Leadership and Learning Organisation at (250) 391-2564.

Name (Please print)

Signature

Date

APPENDIX F

INSTRUCTOR QUESTIONNAIRE

INSTRUCTIONS FOR COMPLETION

This questionnaire is designed to gather instructor reactions to the use of training technology in the Canadian Forces. Specifically, I am interested in measuring your reactions to the technology employed in NOTEC.

Many of the questions that follow can be answered by placing a check mark in the appropriate box (✓). Please select only one response for each question unless otherwise requested. Some of the questions ask you to comment or provide additional remarks; for those questions, please write your response in the space provided. If you require extra space, use the back of the last page. Number your written response(s) in accordance with the appropriate question.

The questionnaire should take 20-30 minutes to complete. All replies will be kept confidential. ***Do not write your name or service number on the questionnaire.*** When you have completed the questionnaire, please place it the envelope provided and return it to the supervisor.

Thank you for your assistance.

PART I - *This section of the questionnaire will gather information about your familiarity with computers and technology in general. Please check only one response for each question.*

Note: 17 instructors responded to this survey.

1. Which statement is most accurate?

   1 (14) I own a computer

   2 (3) I have access to a computer for personal use

   3 (0) I do not have access to a computer

2. How many years have you been using a computer?

   1 (0) Less than 1 year 2 (0) 1-3 years

   3 (3) 3-5 years 4 (14) over 5 years

   5 (0) I don't use a computer

3. Which one of the following tasks do you use your computer for the **most**? (check only one)

   1 (8) Word Processing/Letter Writing

   2 (1) Surfing the Internet

3 (6) Sending/Receiving Email

4 (0) Developing Databases

5 (2) Playing Computer Games

4. Have you ever participated in training or education on the Internet? (If yes go to question 5).

   1 (3) Yes

   2 (14) No

5. What course(s) have you completed using the Internet?

   Responses to essay questions are attached to this questionnaire

6. Using the categories provided, please rate how often you use your computer for the task described in question 3.

Task	Almost Daily	2-3 times/wk	2-3 times/mnth	Never
Word Processing	1 (13)	2 (1)	3 (2)	4 (0)
Surfing the Internet	1 (7)	2 (6)	3 (2)	4 (1)
Sending/Receiving Email	1 (15)	2 (1)	3 (1)	4 (0)
Developing Databases	1 (1)	2 (0)	3 (4)	4 (11)
Playing Computer Games	1 (1)	2 (2)	3 (8)	4 (4)
Spreadsheets/Accounting	1 (2)	2 (3)	3 (5)	4 (6)

7. Listed below are several types of technologies. For each item listed, please specify if you own, intend to purchase or don't use it.

Item	Own	Intend to Purchase	Don't Use
Pentium Class PC	1 (12)	2 (3)	3 (1)
VCR	1 (17)	2 (0)	3 (0)
Television	1 (17)	2 (0)	3 (0)

35mm Camera	1 (13)	2 (2)	3 (2)
Video Camera	1 (5)	2 (4)	3 (7)
Digital Camera	1 (1)	2 (4)	3 (11)
Fax Machine	1 (1)	2 (2)	3 (12)
Cellular Phone	1 (9)	2 (2)	3 (5)
DVD Player	1 (3)	2 (8)	3 (5)
Nintendo System	1 (3)	2 (0)	3 (13)

8. Do you have access to the Internet at home?

   1 (13) Yes

   2 (4) No

9. Which of the following do you use the Internet for the **most**? (check only one)

   1 (8) Email

   2 (5) Research/Information

   3 (1) Online Commerce

   4 (0) Training Courses/Professional Development

   5 (1) "Surfing"

   6 (0) Playing "Online" Games

   7 (2) I don't have access to the Internet

10. Which of the following do you use the Internet for the **least**? (check only one)

    1 (0) Email

    2 (0) Research/Information

    3 (2) Online Commerce

    4 (4) Training Courses/Professional Development

5 (0) "Surfing"

6 (9) Playing "Online" Games

7 (2) I don't have access to the Internet

11. How would you rate your level of confidence with computers and technology in general?

1 (6) High

2 (9) Medium

3 (2) Low

12. What is your general impression of the use of technology to assist in instruction?

1 (7) Very positive 2 (8) Positive

3 (2) Acceptable 4 (0) It adds little value to the training

13. Do you agree or disagree with the following statement: ***Technology, such as Simulators and Multimedia Computer Instruction, improves the quality of my training in the CF.***

1 (5) Strongly agree 2 (11) Agree

3 (1) Disagree 4 (0) Strongly Disagree

14. If you did not agree with the above statement, please explain why below. If you agreed with the statement, go to question 15.

_____

_____

_____

15. As an Instructor, which of the following do you find the **most** beneficial to your students?

1 (0) Textbooks 2 (5) Instructor Lectures

3 (6) Simulator Training 4 (2) Multimedia Computer Training Programs

5 (4) Other (Please Specify) _____

16. As an Instructor, which of the following do you find the **least** beneficial to your students?

1 (9) Textbooks 2 (0) Instructor Lectures

3 (0) Simulator Training 4 (4) Multimedia Computer Training Programs

5 (4) Other (Please Specify) _____

PART II - *This section of the questionnaire will gather information about your reaction to the various types of technology in your military training. Please select the appropriate response to the question.*

17. Listed below are various technologies used in CF Training. For each item, please rate the appeal of each on a scale of 1 - 4 (1 = No appeal and 4 = High appeal). For example if you find Overhead Projectors to have no appeal in your training you would circle 1, some appeal 2 and so on up the scale. Please circle only one response for each item.

Training Media		**Level of Appeal**				
		1	**2**	**3**	**4**	
Overhead Projectors	No Appeal	4	7	6	0	High Appeal
Videotapes	No Appeal	0	2	9	6	High Appeal
Films	No Appeal	3	5	5	4	High Appeal
Chalkboard/Whiteboard	No Appeal	0	5	9	3	High Appeal
Textbooks	No Appeal	3	3	11	0	High Appeal
Study Packages	No Appeal	1	2	11	3	High Appeal
PowerPoint Presentations	No Appeal	0	4	9	4	High Appeal
35mm Slide Shows	No Appeal	3	10	3	1	High Appeal
Computer Based Training	No Appeal	0	3	10	4	High Appeal
Simulator Training	No Appeal	0	1	4	12	High Appeal
Training on Actual Eqmt	No Appeal	0	0	0	17	High Appeal

Guest Lecturers	No Appeal	1	1	8	7	High Appeal
Field Trips	No Appeal	0	0	7	8	High Appeal
Classroom Lectures	No Appeal	0	4	12	1	High Appeal

18. Using the scale below, please identify the number of times per course you are exposed to each type of training technology.

Training Media	Everyday	2-3 times/week	1-2 times/course	Never
Overhead Projectors	1 (3)	2 (2)	3 (6)	4 (5)
Videotapes	1 (0)	2 (8)	3 (7)	4 (1)
Films	1 (0)	2 (1)	3 (7)	4 (8)
Chalkboard	1 (11)	2 (4)	3 (0)	4 (1)
Textbooks	1 (13)	2 (1)	3 (2)	4 (0)
Study Packages	1 (4)	2 (5)	3 (3)	4 (4)
35mm Slide Shows	1 (0)	2 (0)	3 (4)	4 (11)
PowerPoint Slides	1 (13)	2 (2)	3 (0)	4 (1)
Multimedia Training	1 (2)	2 (6)	3 (25)	4 (1)
Simulator Training	1 (3)	2 (7)	3 (7)	4 (1)
Trg on Actual Eqmt	1 (1)	2 (4)	3 (4)	4 (2)
Guest Lecturers	1 (0)	2 (4)	3 (9)	4 (3)
Field Trips	1 (1)	2 (1)	3 (9)	4 (2)
Classroom Lectures	1 (15)	2 (0)	3 (1)	4 (0)
Live Demos	1 (1)	2 (4)	3 (8)	4 (3)

19. Which of the following technologies is used **most often** in your training? (Please check only one)

1 (___) Overhead Projectors	2 (___) Videotapes	3 (___) Films
4 (1) Chalkboards	5 (___) Textbooks	6 (1) Lectures
7 (12) PowerPoint Presentations	8 (___) 35mm Slides	9 (___) Live Demos
10 (___) Computer Based Training	11 (___) Field Trips	12 (2) Simulators

20. For each item listed below, please indicate if you would like to see it used more, used less or not at all during your training.

Technology	Used More	Used Less	Not At All
Overhead Projectors	1 (3)	2 (6)	3 (7)
Videotapes	1 (14)	2 (1)	3 (1)
Films	1 (6)	2 (1)	3 (8)
Chalkboard	1 (5)	2 (9)	3 (1)
Textbooks	1 (9)	2 (6)	3 (0)
Study Packages	1 (11)	2 (3)	3 (1)
35mm Slide Shows	1 (3)	2 (2)	3 (10)
Computer Slides	1 (7)	2 (5)	3 (3)
Multimedia Training	1 (13)	2 (2)	3 (0)
Simulator Training	1 (10)	2 (5)	3 (0)
Trg on Actual Eqmt	1 (16)	2 (0)	3 (0)
Guest Lecturers	1 (13)	2 (2)	3 (1)
Field Trips	1 (16)	2 (0)	3 (0)
Classroom Lectures	1 (3)	2 (12)	3 (0)
Live Demos	1 (15)	2 (1)	3 (0)

21. On average what percentage of your course training time would you say involves the use of Computer Based Training (CBT)?

1 (6) Less than 10%
2 (6) 10-25%
3 (3) 26-40%
4 (0) 41-50%
5 (0) 51-60%
6 (0) 61-75%
7 (0) Over 75%
8 (1) CBT is not used in the course

22. Would you say that too much or not enough course time is spent using Computer Based Training?

1 (1) Too Much Time
2 (6) Just about the right mix of Classroom Training and CBT
3 (7) Not enough time is spent using CBT
4 (2) CBT is not used in this course

23. When a new technology, such as a simulator or computer based training package, is introduced during your training what is your reaction to its use?

1 (4) Very positive
2 (11) Curious, but unsure of the benefits
3 (0) Apprehensive
4 (1) It has no effect on me. It's just another tool for training and learning
5 (0) I prefer no technology in my training

24. Would you like to see more technology used in your training?

1 (16) Yes
2 (1) No

25. If you answered "yes" above, what types of technology would you like to see used in your training? If you answered "no", please explain why below.

_____

_____

_____

26. I believe the use of technology during training...

1 (9) increases trainee motivation to learn

2 (4) increase trainee anxiety

3 (1) decreases trainee motivation to learn

4 (1) decreases trainee anxiety

5 (2) it has no effect on trainees

27. If you said the use of technology during instruction increases trainee motivation please explain why below. Conversely, if you said it doesn't or that it increases trainee anxiety, please explain why below. If it has no effect, go to the next question.

_____

_____

_____

_____

28. As a general rule, how would you regard the use of technology in your training?

1 (5) it is very beneficial to the training

2 (11) it has some advantages during training

3 (0) it has little benefit to the training

4 (0) I don't think any technology should be used in my training

29. Overall, do you think you make effective use of technology in training?

    1 (14) Yes

    2 (3) No

30. Do you think your peers make effective use of technology in their instruction?

    1 (9) Yes

    2 (3) No

    3 (5) Don't know

31. Does it appear to you that technology is being used for a specific purpose in training or just because it is new?

    1 (10) it has a specific purpose in the training

    2 (7) it is used just because it's new

    3 (0) not sure why it is used

32. When a new technology is introduced at VENTURE, is its relationship to the job or specific training role explained to you?

    1 (7) Yes

    2 (10) No

33. Do you think trainee motivation to learn would be higher or lower if they knew the purpose of using a specific technology during your training?

    1 (12) Higher

    2 (0) Lower

    3 (2) Trainee motivation would not change

    4 (3) Not sure

34. Reflecting on your last or current course, would you use the same technology again to instruct?

    1 (15) Yes

    2 (2) No

35. If you answered "No" above, please explain your answer and specify what technology (if any) you would use to instruct this course.

---

36. If the training at VENTURE incorporates the use of computer based training, please rate your general impressions of its contributions to the course(s) it supports. If not, go to question 37.

    1 (6) It is an excellent addition to the course. I find it very helpful.

    2 (10) It is a useful aid, but I think I could learn as much without it.

    3 (0) It interferes with my training. I would prefer if it wasn't used.

    4 (0) I have no opinion.

37. What are your general impressions of the way technology is used in your training?

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38. Are there any other comments you would like to add about the use of technology in your training?

PART III - *In order to analyse the data from the previous two sections, some background information is necessary. Please complete the following questions. All the information will be kept confidential. Your co-operation is appreciated.*

39. Are you male or female?

1 (14) Male

2 (2) Female

40. Your age is.....

1 (___) 16-18 4 (3) 26-30

2 (___) 18-21 5 (8) 31-35 7 (1) Over 40

3 (___) 22-25 6 (4) 35-40

41. Your Marital Status is...

1 (8) Single 2 (8) Married

3 (___) Divorced 4 (___) Widowed

42. Your Official Language is....

1 (2) French 3 (1) Both

2 (13) English

43. Your rank is.....

1 (___) Pte/OS 8 (___) OCdt/NCdt

2 (___) Cpl/LS 9 (___) 2Lt/A/SLt

3 (___) MCpl/MS 10 (2) Lt/SLt

4 (1) Sgt/PO2 11 (9) Capt/Lt(N)

5 (1) WO/PO1 12 (2) Maj/LCdr

6 (___) MWO/CPO2 13 (___) LCol/Cdr

7 (___) CWO/CPO1 14 (___) Other (Please Specify) _____

44. You are a member of the....

1 (11) Regular Force

2 (5) Reserve Force

3 (___) Cadet Instructor Cadre

45. What course are you currently instructing (or just completed instructing)? (please specify below)

_____

_____

If you are an OCdt or above, please answer the following 2 questions. If you are not, you are finished the questionnaire. Thank you for your co-operation.

46. What is your entry plan?

1 (2) ROTP

2 (3) DEO

3 (3) OCTP

4 (___) UTPNCM

5 (___) RETP

6 (___) SUEP

7 (4) Other (please specify) _____

47. Your highest level of education is...

1 (1) High School

2 (1) Bachelor Degree (RMC)

3 (6) Bachelor Degree (Civilian University)

4 (3) Community College/CEGEP

5 (2) Graduate Degree (Masters or Doctorate)

FINAL INSTRUCTIONS

Thank you for taking the time to complete this questionnaire. ***DO NOT sign or date this questionnaire***. Please place it in the attached envelope and return it to the supervisor. All of your answers are confidential and will only be used for research purposes.

INSTRUCTOR WRITEN RESPONSES TO QUESTIONNAIRE

5. QUESTION 5 What course(s) have you completed using the Internet?

6. Nil
9. None.
12. Intro to Internet. Intro to Web Sites.
14. VENTURE, MARS III lessons.
15. MS Office related / GIS applications / theory.

QUESTION 14 If you did not agree with the above statement, please explain why below. If you agreed with the statement, go to question 15.

2. Often we replace "real" training with simulator / CBT. It would be better if it enhanced the real life training.
9. Disagree: a useful training aid but has been used as a substitute for actual experience due to disappearing resources. Should be used as supplement not substitute.
11. Must be balanced with practical training wherever possible.
19. I have not taken instruction by computer, however, I have used the sim. While useful, I found real experience provided better trg.

QUESTION 15 As an Instructor, which of the following do you find the most beneficial to your students? Response #5 Other (Please Specify) _____.

2. Practical at-sea experience.
9. Work experience: OJT.
11. Combination of all above.
12. Time at sea; if not #2.
14. Experience / practical exercises.

QUESTION 16 As an Instructor, which of the following do you find the least beneficial to your students? Response #6 Other (Please Specify) _____.

6. Death by Power Point.
7. VCR, video library.
10. Sim training only if not effectively planned and executed.
15. Previous experience.

QUESTION 25 **If you answered "yes" above, what types of technology would you like to see used in your training? If you answered "no", please explain why below.**

2. Interactive computer based training. More creative and interesting Power Point lessons.
3. I feel we have reached the right proportions between technological and other types of training.
4. More interactive software, more multi-media.
5. A radio room mock up because I don't believe that officers truly understand the importance of communications. I think to see it would allow for a better understanding.
7. Internet study packages so they can be accessed from home.
8. Simulator time could be increased and CBT Lab.
9. Interactive computer training based on real situations.
10. The use of individual technology based training prior to formal instructor – student interaction either in the classroom or NABS.
11. Multi-media, CBT programmes.
12. More computer based (CBT) / online.
13. The capability for students to work in their own time prior to the course.
14. Integrated lesson plans. Fluid use of available technologies.
15. DVD video / task oriented trainers (SHINNADS) actual equipment required for on the job performance. Integration of above items with a cohesive plan.
16. More CBT that will accurately reflect the duties a student will perform at sea.
17. More CBT lessons.
18. More high tech training.
19. I believe the personal interaction between instructors and students is vital for learning and inspiring students.

QUESTION 27 **If you said the use of technology during instruction increases trainee motivation please explain why below. Conversely, if you said it doesn't or that it increases trainee anxiety, please explain why below. If it has no effect, go to the next question**

2. It is as close to the real thing as technology can get. We are here to do the job not read about it. It is a small chance to do.
4. If it holds the interest, the material will be better retained.
5. I believe that the simulator for example makes a student feel he is in a real working environment so there is pressure, however, they are aware that there is no real danger when training.
8. Interactive (make learning more interesting).
9. Adds another skill to learn increasing stress load. No immediate feedback or alternate method of explaining lesson causes student to maintain confusion level if lesson not understood.
10. "Driving your own training." The student is able to move at their own pace, review as required, move around if needed; this gives the student a feeling of self-motivation and

increases their overall feeling of responsibility towards their training (i.e. it makes them more of a stakeholder).
11. Quality – good technology is beneficial, and would affect trainees positively.
12. Training, instruction, briefing, debriefing has yet to be maximized and perfected. A course for staff on simulator teaching should be developed – it must be. There is no balance between sim and sea early on; we need more time at sea.
13. It provides a "feel good" factor and allows them to explore greater student / syllabus interaction.
14. Clearly trainees understand that technology will be very much a part of the job they are training for.
15. Breakdown of fundamentals to individual tasks / elements. Ability to complete complex tasks repeatedly with little risk/cost.
16. If the student and instructor are not given instruction on how to fully utilize this technology then anxiety and frustration sets in.
17. I stated it would increase level of anxiety because the role of the CTO is to some degree quieter since technology takes over and students might struggle through the material without the knowledge of the CTO. It removes some of the benefit of CTO / student interrelations in acquiring new knowledge.
18. It is an interactive way to learn. Immediate feedback by the systems allows the students to see and correct their areas of difficulty and further progress their learning.
19. I believe it is less interactive, and thus allows the student to drift off or wander during lessons. People relate to new ideas better when there is a personal element, not an impersonal computer.

QUESTION 35 **If you answered "No" above, please explain your answer and specify what technology (if any) you would use to instruct this course.**

2. Instructors need to learn what the technology can do and how to use it in order to improve how it is implemented.
19. I would prefer less Power Point. However, most of my trg time is at sea. The sim time should be reduced.

QUESTION 37 **What are your general impressions of the way technology is used in your training?**

1. In my training it is not used much, besides the Power Point.
2. The staff need more training and experience in order to use it. There needs to be more flexibility in scheduling its use more creatively and effectively.
3. Overall, I feel it is good, particularly the NABS. Being able to reinforce learning/teaching points in NABS is an excellent tool prior to going to sea.
4. Often incorporated without an overall plan, though with best intentions.
5. Technology allows for me to keep some skills at a high level however, as an instructor they do not benefit myself as much as students.
6. Times change: so does technology, if we don't keep up – we lose.

7. As an instructor, I am able to have more control over the environment I require to train individual students in, i.e. "tailor made" training runs.
8. Computer is a tool that can be used adequately or not depending on the situation.
9. Used as a substitute for real experience / access to instructor. Should be used as a supplement.
10. Generally speaking, the way technology is currently being used is not as effective as it should be.
11. When well developed to dovetail with other aspects of MOC training, and if the instructor knows how to incorporate it for its true value – it will be a great benefit to students.
12. It is new to VENTURE and thus we are still learning. Staff indoctrination must include courses on maximising motivation and learning potential of technology – specifically the trainer.
13. We are too focused on presentation rather than content.
14. Need improvement.
15. Full spread of technologists is required. An all or nothing approach is essential.
16. The technology and its potential is not fully explained to the instructors or the students.
17. Words and graphics are far superior than any textbook they received (and it is accurate and easy to update).
19. Good tool, but there is an over dependence.

QUESTION 38 **Are there any other comments you would like to add about the use of technology in your training?**

1. No
3. I think we have to be careful that the focus is on the training itself, not on the technology. Most students are quite comfortable with "high tech" equipment and training tools, but there is not always (I feel) a need to upgrade solely because we can.
4. A comprehensive, flexible plan on technology integration is essential.
6. Technology is great as long as we don't lose the human touch!
7. It has the potential to cost effectively offer 24-7 training vs. ships. It just requires the staff and initiative to move forward with this concept. The other option, tasking FFHs, is extremely expensive and I question if a student would be exposed to as many diverse scenarios on a FFH as he/she would/can be exposed to in NABS.
9. Should be fun; not based on boring lectures. Should make student relax / want to participate. Should challenge student with escalating level of difficulty.
10. Overall, the largest hindrance to maximising effective use of technology is the limited training that instructors have/receive in both (a) the actual equipment / program and (b) how it is to be used by the student in relation to training progression. At this time the use of technology moves forward, but at a slow pace due mostly (or most likely) to budget restraints in actual production, but also (to a lesser degree) to the aforementioned gap in instructor capability.
11. Do not offer or accept sub-standard software. Do not forget the end state – MARS officers go to sea, therefore practical phases are great motivators or opportunities for

instruction (YAGs, CCG tours, dockyard and ship tours etc.). Also, guest lecturers.
13. As above. (We are too focused on presentation rather than content.)
15. It is impossible to convince others of the significance of a technology without the understanding of the issues surrounding it.
18. In order for VENTURE to remain the school of excellence for all navigation, it is imperative that we keep up with advances in technology and continue to modify the way we teach accordingly.
19. Instructor – student interaction is much more useful than computer – student interaction. The former leaves a lasting impression.

QUESTION 45 What course are you currently instructing (or just completed instructing)?

1. MARS II, Drill.
2. A/MARS
3. MARS IV
4. Leadership and ethics.
5. MARS IV: Sim Phase/Complete. MARS III: Comm Phase/YAGs/Sim/50%.
7. MARS II
8. Just completed MARS IV.
9. MARS IV(R)
10. MARS III
11. MARS IV
12. MARS IV(R)
13. FNO
14. FNO
15. FNO
16. MARS II, MARS III, MARS IV
17. MARS III
18. DEO MARS III
19. MARS IV /MARS III

QUESTION 46 What is your entry plan? Response #7 Other (Please Specify) _____.

5. GMT
10. RESO
11. SYEP
13. UK graduate / post grad.

APPENDIX G

STUDENT QUESTIONNAIRE

INSTRUCTIONS FOR COMPLETION

This questionnaire is designed to gather information on trainee reactions to the use of training technology at VENTURE NOEC. Specifically, I am interested in measuring your reactions to the technology employed in your training.

Many of the questions that follow can be answered by placing a check mark in the appropriate box (✓). Please select only one response for each question unless otherwise requested. Some of the questions ask you to comment or provide additional remarks; for those questions, please write your response in the space provided. If you require extra space, use the back of the last page. Number your written response(s) in accordance with the appropriate question.

The questionnaire should take 20-30 minutes to complete. All replies will be kept confidential. ***Do not write your name or service number on the questionnaire.*** When you have completed the questionnaire, please place it the envelope provided and return it to the course-training officer.

Thank you for your assistance.

PART I - *This section of the questionnaire will gather information about your familiarity with computers and technology in general. Please check only one response for each question.*

1. Which statement is most accurate?

   1 (28) I own a computer

   2 (23) I have access to a computer for personal use

   3 (3) I do not have access to a computer

2. How many years have you been using a computer?

   1 (0) Less than 1 year 2 (1) 1-3 years

   3 (9) 3-5 years 4 (43) over 5 years

   5 (1) I don't use a computer

3. Which one of the following tasks do you use your computer for the **most**? (check only one)

   1 (21) Word Processing/Letter Writing

   2 (10) Surfing the Internet

   3 (11) Sending/Receiving Email

4 (1) Developing Databases

5 (7) Playing Computer Games

4. Have you ever participated in training or education on the Internet? (If yes go to question 5).

1 (19) Yes

2 (34) No

5. What course(s) have you completed using the Internet?

_____

_____

_____

6. Using the categories provided, please rate how often you use your computer for the task described in question 3.

Task	Almost Daily	2-3 times/wk	2-3 times/mnth	Never
Word Processing	1 (6)	2 (17)	3 (17)	4 (5)
Surfing the Internet	1 (19)	2 (9)	3 (11)	4 (8)
Sending/Receiving Email	1 (23)	2 (6)	3 (7)	4 (9)
Developing Databases	1 (1)	2 (0)	3 (13)	4 (28)
Playing Computer Games	1 (6)	2 (13)	3 (18)	4 (7)
Spreadsheets/Accounting	1 (2)	2 (4)	3 (14)	4 (22)

7. Listed below are several types of technologies. For each item listed, please specify if you own, intend to purchase or don't use it.

Item	Own	Intend to Purchase	Don't Use
Pentium Class PC	1 (28)	2 (16)	3 (6)
VCR	1 (39)	2 (12)	3 (3)
Television	1 (42)	2 (9)	3 (3)

35mm Camera	1 (37)	2 (5)	3 (10)
Video Camera	1 (5)	2 (14)	3 (30)
Digital Camera	1 (0)	2 (12)	3 (36)
Fax Machine	1 (8)	2 (5)	3 (35)
Cellular Phone	1 (18)	2 (10)	3 (23)
DVD Player	1 (4)	2 (20)	3 (26)
Nintendo System	1 (8)	2 (4)	3 (36)

8. Do you have access to the Internet at home?

   1 (33) Yes

   2 (21) No

9. Which of the following do you use the Internet for the **most**? (check only one)

   1 (20) Email

   2 (12) Research/Information

   3 (4) Online Commerce

   4 (1) Training Courses/Professional Development

   5 (5) "Surfing"

   6 (3) Playing "Online" Games

   7 (9) I don't have access to the Internet

10. Which of the following do you use the Internet for the **least**? (check only one)

    1 (2) Email

    2 (0) Research/Information

    3 (15) Online Commerce

    4 (9) Training Courses/Professional Development

5 (0) "Surfing"

6 (18) Playing "Online" Games

7 (9) I don't have access to the Internet

11. How would you rate your level of confidence with computers and technology in general?

1 (15) High

2 (33) Medium

3 (6) Low

12. What is your general impression of the technology used in your training?

1 (9) Very positive 2 (17) Positive

3 (17) Acceptable 4 (10) It adds little value to the training

13. Do you agree or disagree with the following statement: ***Technology, such as Simulators and Multimedia Computer Instruction, improves the quality of my training in the CF.***

1 (14) Strongly agree 2 (29) Agree

3 (8) Disagree 4 (3) Strongly Disagree

14. If you did not agree with the above statement, please explain why below. If you agreed with the statement, go to question 15.

_____

_____

_____

15. Which of the following do you find the **most** beneficial to your training?

1 (7) Textbooks 2 (17) Instructor Lectures

3 (13) Simulator Training 4 (2) Multimedia Computer Training Programs

5 (14) Other (Please Specify) _____

16. Which of the following do you find the **least** beneficial to your training?

1 (11) Textbooks 2 (8) Instructor Lectures

3 (0) Simulator Training 4 (19) Multimedia Computer Training Programs

5 (8) Other (Please Specify)_____

PART II - *This section of the questionnaire will gather information about your reaction to the various types of technology in your military training. Please select the appropriate response to the question.*

17. Listed below are various technologies used in CF Training. For each item, please rate the appeal of each on a scale of 1 - 4 (1 = No appeal and 4 = High appeal). For example if you find Overhead Projectors to have no appeal in your training you would circle 1, some appeal 2 and so on up the scale. Please circle only one response for each item.

Training Media		**Level of Appeal**				
		1	**2**	**3**	**4**	
Overhead Projectors	No Appeal	14	25	14	1	High Appeal
Videotapes	No Appeal	1	12	24	17	High Appeal
Films	No Appeal	6	9	21	18	High Appeal
Chalkboard/Whiteboard	No Appeal	4	15	29	6	High Appeal
Textbooks	No Appeal	8	11	26	9	High Appeal
Study Packages	No Appeal	6	8	28	12	High Appeal
PowerPoint Presentations	No Appeal	11	26	13	4	High Appeal
35mm Slide Shows	No Appeal	18	22	10	2	High Appeal
Computer Based Training	No Appeal	13	19	17	5	High Appeal
Simulator Training	No Appeal	4	2	22	23	High Appeal
Training on Actual Epmt	No Appeal	0	0	4	50	High Appeal
Guest Lecturers	No Appeal	2	6	26	20	High Appeal

Field Trips	No Appeal	0	0	13	41	High Appeal
Classroom Lectures	No Appeal	4	13	31	4	High Appeal

18. Using the scale below, please identify the number of times per course you are exposed to each type of training technology.

Training Media	Everyday	2-3 times/week	1-2 times/course	Never
Overhead Projectors	1 (5)	2 (9)	3 (28)	4 (11)
Videotapes	1 (0)	2 (5)	3 (46)	4 (2)
Films	1 (0)	2 (1)	3 (36)	4 (16)
Chalkboard	1 (31)	2 (19)	3 (2)	4 (2)
Textbooks	1 (39)	2 (15)	3 (0)	4 (0)
Study Packages	1 (13)	2 (17)	3 (19)	4 (4)
35mm Slide Shows	1 (0)	2 (1)	3 (9)	4 (43)
PowerPoint Slides	1 (45)	2 (9)	3 (0)	4 (0)
Multimedia Training	1 (6)	2 (16)	3 (25)	4 (6)
Simulator Training	1 (7)	2 (22)	3 (14)	4 (8)
Trg on Actual Epmt	1 (4)	2 (16)	3 (29)	4 (5)
Guest Lecturers	1 (0)	2 (0)	3 (41)	4 (13)
Field Trips	1 (1)	2 (0)	3 (41)	4 (12)
Classroom Lectures	1 (48)	2 (5)	3 (1)	4 (0)
Live Demos	1 (1)	2 (7)	3 (36)	4 (10)

19. Which of the following technologies is used **most often** in your training? (Please check only one)

1 (___) Overhead Projectors 2 (___) Videotapes 3 (___) Films

4 (2) Chalkboards 5 (___) Textbooks 6 (4) Lectures

7 (47) PowerPoint Presentations 8 (___) 35mm Slides 9 (___) Live Demos

10 (___) Computer Based Training 11 (___) Field Trips 12 (1) Simulators

20. For each item listed below, please indicate if you would like to see it used more, used less or not at all during your training.

Technology	Used More	Used Less	Not At All
Overhead Projectors	1 (9)	2 (23)	3 (16)
Videotapes	1 (44)	2 (4)	3 (2)
Films	1 (33)	2 (6)	3 (9)
Chalkboard	1 (36)	2 (8)	3 (2)
Textbooks	1 (35)	2 (11)	3 (2)
Study Packages	1 (38)	2 (6)	3 (4)
35mm Slide Shows	1 (11)	2 (11)	3 (27)
Computer Slides	1 (11)	2 (27)	3 (10)
Multimedia Training	1 (23)	2 (19)	3 (7)
Simulator Training	1 (35)	2 (10)	3 (3)
Trg on Actual Epmt	1 (50)	2 (0)	3 (1)
Guest Lecturers	1 (39)	2 (9)	3 (2)
Field Trips	1 (48)	2 (1)	3 (1)
Classroom Lectures	1 (20)	2 (27)	3 (1)
Live Demos	1 (49)	2 (2)	3 (0)

21. On average what percentage of your course training time would you say involves the use of Computer Based Training (CBT)?

1 (18) Less than 10% 2 (18) 10-25%

3 (11) 26-40% 4 (2) 41-50%

5 (2) 51-60%

6 (0) 61-75%

7 (3) Over 75%

8 (0) CBT is not used in the course

22. Would you say that too much or not enough course time is spent using Computer Based Training?

1 (22) Too Much Time

2 (25) Just about the right mix of Classroom Training and CBT

3 (6) Not enough time is spent using CBT

4 (0) CBT is not used in this course

23. When a new technology, such as a simulator or computer based training package, is introduced during your training what is your reaction to its use?

1 (10) Very positive

2 (34) Curious, but unsure of the benefits

3 (5) Apprehensive

4 (3) It has no effect on me. It's just another tool for training and learning

5 (1) I prefer no technology in my training

24. Would you like to see more technology used in your training?

1 (29) Yes

2 (23) No

25. If you answered "yes" above, what types of technology would you like to see used in your training? If you answered "no", please explain why below.

_____

_____

_____

26. The use of technology during training...

1 (17) increases my motivation to learn

2 (5) increase my anxiety

3 (11) decreases my motivation to learn

4 (1) decreases my anxiety

5 (18) it has no effect on me

27. If the use of technology during instruction increases your motivation please explain why below. Conversely, if you said it doesn't or that it increases your anxiety, please explain why below. If it has no effect on you, go to the next question.

_____

_____

_____

_____

28. As a general rule, how would you regard the use of technology in your training?

1 (15) it is very beneficial to the training

2 (31) it has some advantages during training

3 (7) it has little benefit to the training

4 (0) I don't think any technology should be used in my training

29. Overall, do you think your instructors make effective use of technology in training?

1 (32) Yes

2 (19) No

30. Does it appear to you that technology is being used for a specific purpose in training or just because it is new?

1 (25) it has a specific purpose in the training

2 (19) it is used just because it's new

3 (10) not sure why it is used

31. When a new technology is introduced during your training, is its relationship to the job or specific training role explained to you?

1 (29) Yes

2 (24) No

32. Do you think your motivation to learn would be higher or lower if you knew the purpose of using a specific technology during your training?

1 (29) Higher

2 (0) Lower

3 (21) My motivation would not change

4 (4) Not sure

33. Would you use the same technology to instruct this course?

1 (36) Yes

2 (16) No

34. If you answered "No" above, please explain your answer and specify what technology (if any) you would use to instruct this course.

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35. If your training incorporates the use of computer based training, please rate your general impressions of its contributions to your learning. If not, go to question 36.

1 (16) It is an excellent addition to the course. I find it very helpful.

2 (29) It is a useful aid, but I think I could learn as much without it.

3 (4) It interferes with my training. I would prefer if it wasn't used.

4 (2) I have no opinion.

36. What are your general impressions of the way technology is used in your training?

_____

_____

_____

37. Are there any other comments you would like to add about the use of technology in your training?

_____

_____

_____

PART III - *In order to analyze the data from the previous two sections, some background information is necessary. Please complete the following questions. All the information will be kept confidential. Your co-operation is appreciated.*

38. Are you male or female?

1 (44) Male

2 (10) Female

39. Your age is.....

1 (0) 16-18 4 (25) 26-30

2 (2) 18-21 5 (8) 31-35 7 (1) Over 40

3 (17) 22-25 6 (0) 35-40

40. Your Marital Status is...

1 (44) Single 2 (8) Married

3 (2) Divorced 4 (0) Widowed

41. Your Official Language is....

1 (10) French 3 (1) Both

2 (43) English

42. Your rank is.....

1 (___) Pte/OS 8 (4) OCdt/NCdt

2 (___) Cpl/LS 9 (38) 2Lt/A/SLt

3 (___) MCpl/MS 10 (6) Lt/SLt

4 (___) Sgt/PO2 11 (6) Capt/Lt(N)

5 (___) WO/PO1 12 (___) Maj/LCdr

6 (___) MWO/CPO2 13 (___) LCol/Cdr

7 (___) CWO/CPO1 14 (___) Other (Please Specify) _____

43. You are a member of the....

1 (41) Regular Force

2 (13) Reserve Force

3 (___) Cadet Instructor Cadre

44. What course are you attending? (please specify below)

_____

_____

If you are an OCdt or above, please answer the following 2 questions. If you are not, you are finished the questionnaire. Thank you for your co-operation.

45. What is your entry plan?

1 (5) ROTP

2 (29) DEO

3 (7) OCTP

4 (1) UTPNCM

5 (1) RETP

6 (___) SUEP

7 (8) Other (please specify) _____

46. Your highest level of education is...

1 (5) High School

2 (5) Bachelor Degree (RMC)

3 (27) Bachelor Degree (Civilian University)

4 (11) Community College/CEGEP

5 (1) Graduate Degree (Masters or Doctorate)

FINAL INSTRUCTIONS

Thank you for taking the time to complete this questionnaire. ***DO NOT sign or date this questionnaire.*** Please place it in the attached envelope and return it to the supervisor. All of your answers are confidential and will only be used for research purposes.

TRAINEE WRITEN RESPONSES TO QUESTIONNAIRE

QUESTION 5 What course(s) have you completed using the Internet?

1. Maths 303. Basic Interest and Computer Database.
5. University level Politics, Economics and History.
6. Entomology – University credit course.
14. Nil.
15. Nil.
16. Miscellaneous undergrad research.
19. None.
20. None.
24. Don't remember.
29. Part of MARS III.
32. None.
33. French In Action (Tutorials and lessons completed on line).
36. MARS III Web lessons.
37. Computer Science 1000.
39. MARS II Web lessons.
40. MARS III Web lessons.
46. Language Program (Mat Lab, and Fox Tran).
47. MARS Intranet.
54. MARS III. IQ tests. Surveys.

QUESTION 14 If you did not agree with the above statement, please explain why below. If you agreed with the statement, go to question 15.

8. I find that the software used does not tie in with the training in the classroom.
12. I have a hard time learning on a computer. I like to flip through books for info not scroll through pages on a computer program. I cannot study effectively on a computer. I cannot see (vision blurred for days) after spending 8 hours per day on a computer screen trying to study off it. Also, I learn more from the real environment vice the simulator. Computer based training not conducive to my style of learning. I am also fairly computer illiterate.
21. Computer instructing is OK until you have a question.
22. It's bullshit. Let's get out in the real world.
23. Agree with the sims but not the multi-media.
29. Power Point and the Web lessons are just crutches for the instructors. Could be used better i.e. the Web lessons did not explain things very well. Simulators need better graphics, wind, rain and a moving deck.
31. If have specific questions about the subject matter, impossible to ask computers, computers do not give you a two-way conversation.
34. The multi-media lessons I do not find useful. It would be better taught by the CTOs.
39. Power Point lessons are no better than OHP lessons except that one may take a copy home to review.

41. No simulator can replace real world experience. It is only cheaper but when it comes to lives, money should not be an issue.
42. Simulators do not replace training on actual ships. MARS II lectures on knots are not suitable for Power Point.
45. Nothing can simulate real, hands-on training.
48. Hands-on instruction from a knowledgeable and professional instructor is far more beneficial for students than learning from a computer.
49. Too many "things" intangibles are lost by instructors and students. Quality of instruction is average to poor because of training aids (crutches). Lip service is paid to actual instruction, no verification that students actually learn the proper way to complete tasks required of them. Computers cannot confirm that students learn what is required of them. Why assess navigation in a simulator and develop it as sea on ships? This is completely backwards to me. I believe that simulators are an excellent way to develop the basic skills of an OOW, but not to assess. Power Point is a great visual aid for instruction, but it is being used as the instructor. To often I've seen instructors read exactly what is on the "clip board." My little diatribe, but, must return to basics of instruction: instruction, demonstration, and repetition.
53. Because nothing is as good as real, practical exercise.

QUESTION 15 **Which of the following do you find the most beneficial to your training? Response #5 Other (Please Specify) _____.**

5. Sea time.
6. Hands-on practical training.
10. Sea Phase.
12. Sailing at sea, hands-on experience.
13. You need all four combined.
14. Shipboard training.
16. Conv with instructor.
22. Studying in my room.
23. Hands-on work.
24. Sea Phase.
25. Practical applications.
27. Practical / experimental based instruction.
29. Hands-on training i.e. YAG trip, boatshed, mock-up.
40. Good instruction.
41. Sea Phases.
42. Training on actual equipment.
52. Practical training at sea.
53. There has been a lack of instructor teaching.

QUESTION 16 **Which of the following do you find the least beneficial to your training? Response #6 Other (Please Specify) _____.**

3. Power Point lectures.
13. See above. (You need all four combined)???????
15. None.
16. Power Point.
20. Unnecessary readings.
26. Outdated videotapes.
29. Use of Power Point.
44. Being read to by an instructor from a Power Point slide which quotes a text in lieu of proper learning.
47. Unmotivated or untalented instructors.

QUESTION 25 **If you answered "yes" above, what types of technology would you like to see used in your training? If you answered "no", please explain why below.**

1. Simulate a seamanship evolution.
2. I like it the way it is, but prefer the simulator to the CBT Lab. Staring at computer screen tends to be hard on the eyes, as does reading off a computer screen.
3. No, more "real hands-on" training, less "simulated training."
4. More simulator time, more multi-media programs on CBT, more interactive technology, use of films / videotapes (if up dated), less classroom use of Power Point – more as a study package.
5. More multi-media computer programs, but care must be taken to ensure they are correct, current and error free.
6. More CBT aids for self-study (i.e. OOD program, Wheelhouse, etc.). More feedback from manoeuvres / environmental conditions in the simulator (i.e. pitch on turns etc.). Better visual images in simulator.
7. Internet based training, access from remote sites to online training software.
8. More simulator technology.
9. Like to see more "hands-on" with bridge equipment such as radars. Time could be better-spent (see #1) than learning computers.
10. Good multi-media, interactive on CBT Lab.
11. It is rarely beneficial in helping us learn the required material.
12. CBT non-personal, no instructors to answer questions right away, explanations are too dry and above board. You feel like you are teaching yourself the course. Computer glitches and crashes. Screen is not healthy. I have nothing against technology, but I have a problem with it replacing the instruction given by real people who do the job in real life (i.e. MARS officer).
13. Must keep up with technological advances, computer programs and updates.
14. Networking. Satellite – video link to Halifax instructors / ships. Little robot to serve the coffee.
16. Too much emphasis on sim vs. sea time.
17. Learning tools, i.e. more programs like the Wheelhouse Companion.

18. Ensuring that the latest versions of software are available, both at VENTURE and in the Fleet.
20. Because there is nothing else like time at sea and experience of an instructor.
24. Weapons.
26. Very good idea to issue laptop computers with all lesson plans, but understand not always feasible.
27. Laptop based lessons.
31. Keep it simple, please!
33. The ratio of class size to the number of computers or space is a problem. People doubling up on a computer is ineffective and frustrating.
35. More interactive programs.
36. Program based learning – each person should have a computer for the lessons – not three to a computer.
37. Virtual Reality. Video games on subject matter.
38. Technology that can help prepare a student for the real thing such as the simulators.
39. Implement effective, efficient training techniques regardless of its categorization.
42. Programs such as Wheelhouse are useful, however, 40 people using 20 computers for CBT is not conducive to proper training.
46. To learn by myself, this way will be faster.
47. The main thing I need more of is quality instructor training and if computers assist or motivate the instructor then they are good, if they switch off the instructor they are bad.
48. It detracts from the level of instruction that is needed for students to succeed in their training.
49. More simulator time as development.
51. More CBT training and simulator training.
52. Let's use more of the technology that we will be using in the Fleet.
54. Better computer lessons, set up video conferencing, with CDS, MARCOM, maybe people deployed oversees to see and hear first hand what they are doing.

QUESTION 27 **If the use of technology during instruction increases your motivation please explain why below. Conversely, if you said it doesn't or that it increases your anxiety, please explain why below. If it has no effect on you, go to the next question.**

2. It just creates a change in pace, which is a type of motivation in itself.
3. Because sometimes you spend more time learning about the learning tool than learning the subject matter you should be studying.
4. Use of simulators allows for practical learning of classroom skills, lectures, and lessons previously learned. Provides for a hands-on experience, however, CBT lectures as useful as they are, are difficult to learn from in the CBT classroom environment.
5. It is more interesting than reading from a text book.
6. Much like a child finds something new, it's a new toy to play and discover with. This is important to tactile learners.
10. It is one more approach to learn something.

11. For the reason stated above – I end up frustrated because I think of the time I am wasting, rather than learning. It seems counter-productive due to the short amount of time.
12. See explanation in Q.25. I am unfamiliar with technological things. My anxiety is up when I have to learn my course content and also how to use the technology (i.e. computer) when there is so little time. I was in school before computers and have not been able to take courses to date, on how to use them or their software programs, except to type in a letter and print it off. This adds to the stress level.
13. At least I feel that we are trying to stay with the times and technology.
14. NA
15. I can easily control the pace that I am learning at.
16. While it might be a more informal atmosphere, the sim allows (reasonably) stress-free time to get used to new concepts. This can be good and bad.
17. I enjoy using computer aids and keeping up with civilian standards.
27. It is more sensory stimulating which engages me (at least initially) to learn.
30. Too many bugs, always a hassle.
31. I prefer the information presented in a simple, easy to follow format.
33. As above, it is difficult to learn when people are doubled up on computers and in cramped space. It gets frustrating because you are not absorbing anything you are going through.
35. Allows me to learn at my own pace.
37. Easier, more readily available.
38. CBT does not motivate me to learn. I'd rather do things like that from a book. However, a simulator encourages me because I'll be placed in some situations and under stressors that I may encounter on a real ship.
39. Toys have no intrinsic value in education.
43. CBT lessons are the most boring, alone in front of a screen decreases my motivation.
45. I would rather do hands-on.
47. It only really increases my motivation if combined with motivated instructors. One can come across instructors who use technology to escape instructor responsibilities.
48. I would rather see more money invested into quality instruction, rather than the acquisition of more technology.
51. More realistic and interesting.
53. Part of the problem is too many students / not enough computers. You can't learn well with 3 to 4 people on one computer. It is also taking away from classroom teaching, which I prefer and find more effective. If I am going to learn from a computer, I can do that at home. That's not why I am here.
54. The potential is there to make material more interesting rather than just having to listen to your CTO talk, i.e. videos of evolutions, rules of the road, simulator training, etc.

QUESTION 34 **If you answered "No" above, please explain your answer and specify what technology (if any) you would use to instruct this course.**

3. I would use actual equipment wherever possible.
4. Increase the use of simulators, decrease the use of Power Point presentations as a lecture aid, allow for more CBT presentations on a personal laptop instead of within the classroom.
11. I believe hands-on training as much as possible both in the classroom and the environment in which you will be working is the most beneficial.
12. Continue using simulator.
19. However, more time at sea for real.
21. Lectures and smaller classes.
22. More CBT.
23. Hands-on examples, I would not just put people in front of a computer where they might zone out.
29. When using Power Point I would find a balance between relying on the slides and preparing a solid lecture, the CBT room is not big enough for our class and the lessons do not instruct very well, as well, I would prefer to train on an actual ship not in a simulator.
31. Less computer based and more teacher – student interaction.
33. But not during class time, make it an "on your own time" thing so that you can use, actually absorb what you are going through.
34. I would use classroom time for certain lessons that were done in the CBT.
38. Death by Power Point. As soon as that thing goes on, minds shut off. In class we need quality instruction – less reading more teaching. After a Power Point lecture I usually refer to my books to figure out what is going on. CBT could be useful to some students, but I find reading and old-fashioned books easier than looking at a screen for long periods of time. You make notes anyways.
42. If cost was not a factor I would eliminate simulator training.
43. Nothing replaces an instructors lecture with Power Point except for the simulator and sea phases.
49. CBT Web based lessons on MARS III were never verified by the instructors. Technology was used "as" the instructor. The lessons are great as a terms of reference or reading prior to the lecture, but it does not replace instruction and instructors answering questions.
53. There is too much emphasis on "new technology" these days. People are forgetting to "get back to the basics" of "hands-on" teaching, learning, and seeing. Not watching it on a screen. Some people can learn that way, I think more can learn in an interactive environment - see, then do, hands-on approach.

QUESTION 36 What are your general impressions of the way technology is used in your training?

2. Some of it enhances training, but some aspects appear to be money savers, i.e. some CBT lectures.
3. Not enough time spent on background to become proficient enough to use the tools to my full advantage, often get frustrated thus decreases my motivation.
4. The use of technology in training has been beneficial to the point where it has been over used (i.e. Power Point presentations) to where it has become a deterrent from learning.
5. It was used semi-effectively without the proper background information being given to the students.
6. A concerted effort is made to use all technologies relevant to the topics presented for the benefit of all learners, but it is apparent not all technologies are understood or used properly.
8. Could be more effective if it was more realistic and tied in with classroom material.
9. Much of the technology is new and therefore has "bugs" that have to be worked out. Useful for presentation of material but does not interact with instructors.
10. It is a good goal but it needs to be refined.
11. Power Point is over used. Lectures that could be CBT are not and several CBT courses should be taught in a different manner.
12. Impersonal, constant glitches occur with the system, breakdowns and then training is put on hold or you miss out on something all together because of course time constraints.
13. So far so good – need to learn to use all the tools.
14. It helps in developmental phase.
15. It is about time we (Navy) caught up with technology.
16. Can be very helpful, but cannot completely replace standing on the deck plates and being daunted by the task at hand.
17. Effective, well balanced.
19. Good but we should have a wider access to the Internet. There are not enough connections for the number of students in VENTURE NOTC.
20. Very impressed.
21. It is dependent on too much.
22. Not enough.
24. Its use of is good efficiency.
25. Overuse Power Point in MARS II. More personal instruction would be better than using computers.
26. Supplement training received in classroom.
27. The proper use of computers in instruction is a relatively new area in education and I think the military is moving in the right direction by incorporating their use into their courses.
28. Power Point presentations and computer based training serve as a means to reduce instructor preparation and involvement.
29. I think technology should be used as an aid to instruction and not a substitute for good instruction.

30. Lot of bugs. Should be the bomb, but really it is often a hassle or U/S.
31. Needs to be tied into course material better. If lessons are computer based, instructors need to still go over material.
32. It could be expanded.
35. Often more informative and helpful than instructors. Stop using eight-year-olds to write your software.
36. Power Point lessons are good when used in conjunction with a lecture but when solely for lecture purposes are boring and the info could be read at home. The Web lessons were great, however, three people to a computer does not aid in the learning process.
37. Not to its full extent.
38. It's used too much when it's easier (that is Power Point, CBT). Not enough where its actually useful (simulators).
39. Ineffective at time, well at others.
43. CBT should be abandoned.
44. Some good, some bad. Power Point interferes strongly with the lecturing. Instead of basic description with emphasis and benefit of the experience of the instructor we have excerpts from the text read to us. Use less.
46. No, enough used.
47. As said before, I am concerned that instructors use it as a crutch. Outstanding instructors are the best learning aid.
48. It is used as a crutch for weak instruction.
49. It is not being used as an aid to training, it is the training.
50. I prefer to read in a book, but it's useful for understanding when you need animation.
52. It helps.
53. See question 34.
54. Not fully utilized, videos are very old. Too much dependence on Power Point.

QUESTION 37 Are there any other comments you would like to add about the use of technology in your training?

2. It can be great, but overuse or misuse can be very detrimental. "Death by Power Point" comes to mind.
3. Were MARS officers better trained when the courses were longer and on sea going ships? It's easier to learn about shipboard life while at sea.
4. As stated above, I would like to see Power Point presentations and CBT lectures incorporated into a self-study package on a personal laptop. Films and videotapes to be used more in the classroom and increase simulator time for hands-on practical experience. Maintain the use of hard copy texts and instructor lectures however.
5. Technology has its place but must be tied in with, and supplemented with classroom instruction and other teaching aids.
6. While the applications of various technologies in our training can enhance the ability of all to learn the material, misuse can disrupt and hinder the learning process. Using a piece of equipment too much (or too little) can have great impact on the learner's attention span, comprehension and desire to learn. An equal balance of all technologies is needed to ensure that material is presented in such a manner so that all

may absorb and understand it. Furthermore, new technologies should not always over rule the old ones. Many people find getting up and working on the chalkboard or overhead to solve a problem to be more beneficial than sitting at a computer. Finally, instructors should be basically familiar with several different methods of presenting the material in stimulating ways. While having lecture notes and slides prepared in advance by Standards is convenient, "Death by Power Point" is a very real phenomenon. Departure from the prepared material should be encouraged, especially if it will help the understanding of the class, so long as it is relevant and not used "on the fly."

9. It has potential as a learning aid, e.g. computer programs with study material and quizzes. However, I do not believe a student should be assessed using these tools. Traditional examination and simulator assessments can be very useful.
12. On CBT there is not staff in the room to answer questions when wording and concepts are not understood (particularly difficult in this area at night when self-study packs are handed out). Sometimes it is too late to get a question answered the next day.
14. Technology is great as a tool to assist in training, but it is no replacement for OJT on a ship where reality comes into play.
16. Less Power Point.
19. Simulator is good but time at sea is invaluable.
22. No.
24. Laptop for MARS III is very useful.
25. There are 2 or 3 students per computer in the CBT Lab. This is not conducive to learning.
27. However, constant assessment and evaluation as to the effectiveness of the medium in addition, reference to current research WRT computer instruction will ensure computers (and other multi-media) are not used only for the sake of using them.
34. If the CBT is used ensure enough computers available for all instead of 3 to 4 students trying to work on one screen.
37. Learn how to use it.
38. I think technology has its advantages but it should be used as a training aid, a tool to help us learn. It should not be the bulk of a lecture (Power Point) or replace a lecture (CBT) altogether. Technology is useful but its people that make the difference.
39. First train instructors on instructing; knowing the material does not mean one can teach it. Develop curriculum incorporating all available tools versus piecemeal assembly and substitution of techniques (that is i.e. use Power Point lectures as self-study material supplemented by lectures for discussion and clarification).
43. Use of technology needs some retroaction in order to be interesting.
47. As question 36.
48. Technology should be used as a means to support good instruction. It should not be used as an alternative for a lack of good instruction.
50. A personal computer is too expensive for the result.
53. Once again too much emphasis on what a machine can teach. Soon we won't need teachers if this keeps up. I disagree. I think the need for teachers, real teachers, is even greater now. People can't learn human interaction, problems, solutions from a computer.

54. Use video conferencing. Practice in sims (passage planning) before proceeding to sea as well as after.

QUESTION 44 What course are you attending?

1. MARS IV(R)
2. MARS IV
3. MARS IV
4. MARS IV
5. MARS IV
6. MARS IV.
7. MARS IV
8. MARS IV
9. MARS IV(R)
10. MARS IV
11. MARS IV
12. MARS IV
13. FNO
14. FNO 0001
15. FNO 0001
16. FNO 0001
17. FNO 0001
18. FNO
19. FNO 0001
20. FNO 0001
21. MARS III
22. MARS III
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53. MARS III
54. MARS III

QUESTION 45 What is your entry plan?

1. RESO
4. RESO
5. RESO
6. RESO
7. UNTD
8. Component transfer CEOTP.
12. CFR
16. RESO

APPENDIX H

NEW TRAINING PARADIGM ADVISORY GROUP MEMBERS

THE NAVAL OFFICERS TRAINING CENTRE

NEW TRAINING PARADIGM ADVISORY GROUP

Chairperson:	Commander M.R.Bellows	Commanding Officer
Deputy Chair:	Lt(N) D. Poirrier	Training Standards SME
Members:	LCdr A. Evans	Executive Officer
	Lt(N) T. Fiander	MARS SME
	Lt(N) C. Pedrick	Navigation SME
	Mr. D. Klektau	Information Technology SME
	Mr. A. McCrea	Web Courseware SME