

ATHABASCA UNIVERSITY

**IMPROVING LEARNER MOTIVATION THROUGH
ENHANCED INSTRUCTIONAL DESIGN**

BY

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A thesis submitted to the

Athabasca University Governing Council in partial fulfillment

Of the requirements for the degree of

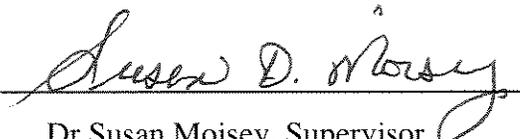
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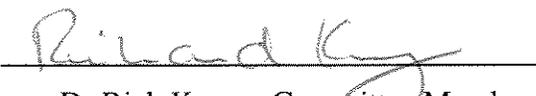
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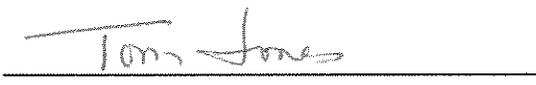
April 2007

ATHABASCA UNIVERSITY

The undersigned certify that they have read and recommend to the Athabasca University Governing Council for acceptance a thesis, "IMPROVING LEARNER MOTIVATION THROUGH ENHANCED INSTRUCTIONAL DESIGN" submitted by Dennis Margueratt in partial fulfillment of the requirements for the degree of MASTER OF DISTANCE EDUCATION.


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DEDICATION

This thesis is dedicated to my wife, Sally Margueratt, for her considerable support and patience over the years it took to complete this and my previous graduate degree. Sally ensured for nine long years that tea was served in the office when my studies started to get the best of my energy. Without her love and encouragement, completing these studies would have been far less rewarding.

ABSTRACT

The purpose of this thesis was to examine the relationship between the instructional design methodology used to design and develop a distance learning product and learner motivation. Evidence from readings consulted in preparing this thesis suggested that motivation is not often a prominent consideration in the design of distance learning products. In the early 1970s, John Keller wrote about the relationship between motivation and instructional design resulting in the creation of four elements -- Attention, Relevance, Confidence, and Satisfaction (ARCS) -- that has become a predominant model of learner motivation.

A quasi-experimental research design, a One-Group Pretest and Posttest, was used to investigate the influence of instructional design methodology on learner motivation. The sample for this study consisted of 204 learners enrolled in the Defense Management Course at the Royal Military College in Kingston, Ontario. Two questionnaires, administered before and after an instructional design intervention based on Keller's ARCS model, were used to gather data on learner motivation. A significant difference between the means for the total scores between the two questionnaires was demonstrated using a Paired Sample T-Test. The analysis of the ARCS elements was conducted using a Non-Parametric, Two Related Samples, Wilcoxon statistical test. Statistical analysis revealed that, with the exception of Relevance, all of the ARCS elements were significantly positively influenced as a result of changes made to the instructional design of the revised lessons. Finally, an analysis of the dependent motivational components of locus of control, self-efficacy, and intrinsic and extrinsic motivation are provided and discussed in terms of their relationship with the ARCS elements.

ACKNOWLEDGEMENTS

I wish to thank my thesis supervisor, Dr. Susan Moisey, for her considerable help and guidance during the development and writing of this thesis. I gained a great deal of insight into the thesis writing process through Dr. Moisey's ongoing support and gentle critiquing of this work at its various stages. I would also like to thank my thesis advisory committee, Dr. Rick Kenny and Dr. Tom Jones, for their help and guidance in crafting this research effort. Last but not least, I would like to thank the entire MDE staff at Athabasca University for their wonderful administrative support over the years I was an Athabasca student. Principal among those at Athabasca who have been extremely helpful is Ms. Glenda Hawryluk. Glenda was always available to answer questions on any subject I might conjure up and consistently maintained the spirit of Athabasca University with her "Cheerio from Athabasca" sign-offs on email. She was also of significant help in assembling the data received in the process of developing this thesis. My learning experience at Athabasca would have been certainly diminished without Glenda's contributions.

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CHAPTER 1

INTRODUCTION

Many of the articles written and research conducted on the subject of learner motivation in the context of distance learning focuses on learner attributes. The premise of these writings and research is that understanding learners and what motivates them to persist in distance education will help distance educators anticipate what mechanisms might be incorporated in the distance learning program to attract and retain distance learners. Certainly, such studies have had a very positive impact on the quality of distance learning resulting in much greater awareness of such elements as administrative support, timely feedback, flexible learning models, control over the learning process by the learner, respect for the learner, and so forth. But what of the process through which distance learning is created? What about the instructional design process and the effect of instructional design strategies on learner motivation?

As the scope of the literature on this subject attests, motivation is a very translucent term that takes on various meanings depending on the context in which it is viewed. Some authors argue that motivation is principally a factor of self that is developed over years of influences from family, education, society, and general life experiences (Roblyer, 1999). Others, such as Keller and Burkman (1993), attribute learner motivation to the role courseware designers and instructors play in the design, development, and delivery of instructional materials. They point out that, all too often, designers and instructors consider motivation to be the student's responsibility. As Keller and Burkman paraphrase, "I can design (or teach) a good course, we often hear, but it's up

to the students to decide if they want to learn it" (p. 4). It is true that an educator cannot totally control a learner's motivation; however, it is reasonable to assume that poor instruction can demotivate an otherwise motivated student, and excellent instruction can inspire an otherwise unmotivated learner. What is agreed within the context of education is that motivation is a prominent determinant of how well learners will do in their learning endeavors and their persistence to remain in an educational program. The ability to affect learner motivation is particularly relevant in distance learning where the instructor is physically removed from the learner and therefore may have less influence on learner motivation. Consequently, it is very important that distance educators, administrators, and those designing distance-learning products appreciate the effect of motivation to the continued involvement of their learners (Abdul-Rahman, 1994).

Brindley (1987) and Fasig (1982) highlight the importance of nurturing learner motivation in order to reduce attrition rates within distance learning programs. High dropout rates have a significant financial impact on institutions for various reasons including the administrative and overhead costs associated with processing admissions only to have a number of students withdraw early in a program. The effect, they argue, is lost revenue over the longer term coupled with the need to finance increased marketing in an effort to attract other students to the program. Brindley in particular notes that while specific motivational factors related to course withdrawal are difficult to specifically identify, there is a definite relationship between motivational factors and attrition. As a result, understanding what motivates learners in an educational program and attending to those motivational factors early in the instructional design process that are most likely to enhance persistence, will invariably pay dividends over the longer term.

Learners are generally motivated to enter a distance learning program for reasons of career enhancement, improvement in job related performance, or for the convenience distance learning offers those learners living and working in locations that do not afford easy access to a residential program (Cannon et. al., 2001). Once engaged in a learning experience, the reason for remaining engaged in learning turns to "incentive motivation" wherein the individual strives to achieve a pre-established goal or target for which they perceive a reward for fulfilling their intended goal (Gagné & Driscoll, 1988, p. 25). Gagné and Medsker (1996) also note that not only do motivated learners focus on a goal they have established for themselves, that goal must be achievable. Consequently, motivation of the learner must be sustained throughout the learning experience in order for goal achievement to remain a reality and the focus of learning.

In the late 1970s, John Keller commenced work on learner motivation that eventually resulted in the development of an instructional design model referred to as ARCS. ARCS is an acronym for Attention, Relevance, Confidence, and Satisfaction (Smith & Ragan, 1999). Gagné and Driscoll (1988) provide the following definition of the four ARCS terms:

Attention: Arousing and sustaining learner curiosity and interest.

Relevance: The learner is aware that the learning being undertaken has personal value or importance.

Confidence: Learners must believe that they can accomplish the goal of learning successfully.

Satisfaction. Satisfaction is the feeling accompanying the process of reinforcement (p. 71).

Keller developed instructional design strategies to address each of the elements in his ARCS model. Although these strategies have been available for several years, there is little evidence they receive specific attention by instructional designers in the broad context of designing distance-learning courseware. While instructional design invariably tries to follow a set design model, such as that found in a variety of Instructional Systems Design (ISD) formats, elements specifically focusing on learner motivation often appear to be missing indicating the authors have neglected to adequately consider learner motivation as part of their design strategy.

Statement of the Purpose

The purpose of this study was to examine the influence of instructional design strategies and methodologies on learner motivation.

Some research, notably that conducted by John Keller, has already identified areas where instructional design can positively impact learner motivation, principally in face-to-face educational settings. However, as Miltiadou and Savenye (2003) note, more research is required that will "shed light on which motivational constructs can be identified as predictors of success in an online environment." (p. 21). As they point out, there is a growing interest by learners in online courses; however, there is a lack of sufficient studies on the effects of design criterion that can potentially heighten learner motivation and concomitantly reduce attrition rates in online courses. Abdul-Rahman (1994) identified a similar concern with respect to dropout rates and suggested that "identifying factors that interact to affect students' completion or non-completion of a distance education course" (p. 9) would go a long way to arming administrators and

distance educators with information and tools that will help reduce learner attrition in distance education.

The overall purpose, then, of this study will be to examine the effect of certain instructional design practices, elements, strategies, and methodologies intended to improve the motivation of distance learners. In addition to the effects of enhanced motivation on attrition is the need for distance educators to identify the more lasting benefits of instructional design on learner attitudes toward future distance education programs and courses.

Research Question

This study will focus on the relationship between instructional design and learner motivation to determine how varying the instructional design methodology may influence learner motivation toward distance learning. In addition, the study will explore the relationship between an instructional design strategy that specifically targets learner motivation and elements of individual motivation (i.e., locus of control, intrinsic and extrinsic motivation, and self-efficacy).

Theoretically, enhancing the instructional design methodology, particularly in the direction of learner motivation, such as through the use of Keller's ARCS model, will have a positive influence on learner motivation. If learner motivation is enhanced through the selection of a particular instructional design methodology, then using this methodology to design and develop distance learning programs and courses will presumably have a positive effect on learner attitudes toward distance learning.

The following research questions are the subject of this exploratory study:

1. Does the type of instructional design methodology used in course development affect learner motivation?
2. To what degree, if any, does varying the instructional design methodology affect locus of control, intrinsic and extrinsic motivation, and self-efficacy?

Assumptions of the Study

The course selected for this study currently exists in a paper based, correspondence format consisting of two modules. For the purpose of this study, two lessons of the second module were redesigned and provided to learners as a MS Word email attachment. Learners had the option of either printing the document or using it electronically. In the latter mode, learners could take advantage of the electronic navigation and links imbedded within the module.

It is assumed that delivering the two lessons of the second module in a slightly different format (electronic Micro Soft Word) from that of the hard copy first module will not affect learner motivation. In other words, had the first module been delivered in the same format as the second module, learner motivation would be consistent across both modules regardless of the delivery technology.

Some learners taking the course used in this study normally undertake these studies in partial fulfillment of mandated professional development. They are, it could be argued, a captive audience whose motivation toward learning is driven to a large degree by the desire for professional advancement. It is assumed, therefore, that any improvement in motivation toward distance education, measured as a part of this study, is the result of enhancements made to the instructional design of the second module and not

a consequence of the need to complete the course in order to satisfy a requirement of the learner's professional development.

Significance

It is anticipated this study will contribute in a significant manner to the body of knowledge related to increased learner motivation through enhanced instructional design. As Wlodkowski (1999) points out: "although there are numerous research studies of adult motivation to participate in structured adult education programs (as cited in Deshler, 1996), there are no major research studies that thoroughly examine the relationship between adult motivation and learning" (p. 4). The literature review conducted in support of this study supports Wlodkowski's findings.

In addition, it is anticipated that determining certain instructional design elements that improve learner motivation will positively affect dropout rates in distance education. Dropout is a major concern, as highlighted by Sung (1986) and Brindley (1987), and is a significant element of consideration for decisions made to improve distance education. The assumption being, a more motivated learner is likely to continue studying through distance education than one who finds distance education a sub-optimal method of learning.

Finally, Keller (1983) noted that "the assumption all too often" is that if "instruction is of good quality, motivation will take care of itself. Unfortunately, this assumption has been found to be only partly true. When we examine the meaning of *quality instruction*, we discover that it generally refers to results in more or better learning per unit of time than other comparable methods of instruction" (p. 388). Keller goes on to

say that quality does not adequately account for motivation because quality is generally linked to efficiency and effectiveness rather than to sound instructional design strategies that focus on learner motivation. Rothwell and Kasanas (1992) agree with Keller in the debate of “efficiency vs. effectiveness” as they relate to the quality of design. They observe that efficiency can be stated simply as - “Are we doing things right” (p. 5). In this question the phrase *doing things right* means “without unnecessary expenditures of time, money, or effort” (p. 5). Effectiveness, however, often means the match between results achieved and those needed or desired. The central question related to effectiveness is - “Are we doing the right things” (p. 5). In this question, the phrase *right things* typically means, “what others expect or need from the organization, group, or individual” (p. 5). The focus of both definitions clearly relates to factors outside the quality of the instruction as reflected in Keller's concern over the use of these two terms when considering the quality of design. This study focused on improving the quality of design of the courseware used in the research.

Limitations

The following was identified as a limitation of this study:

- The original sample for the quantitative analysis of this study consisted of 204 subjects; however, data from 26 subjects was eventually used to conduct the analysis because of low questionnaire returns. A larger sample size would have been desirable; however, because a module of program content was redesigned to incorporate specific instructional design elements intended to enhance learner

motivation, a course of limited capacity and one accessible to the author had to be selected.

Delimitations

Creswell (2003) describes delimitation as a means of limiting the scope of a study. This study has the following delimitations assigned to focus the study within a manageable framework:

- The study only used two lessons taken from an existing course as the test bed for measuring learner motivation in relation to particular instructional design elements.
- The study utilized print-based media alone in order to accommodate available technologies and the ability of the learners to adapt to the revised module format without extensive direction in the use of an unknown medium.

Definitions of Terms

The following is a list of terms and definitions used during this research.

Motivation

Gagné and Medsker (1996) define motivation as "cognitive persistence: the drive, tendency, or desire to undertake or complete a task, expend effort, and do a quality job" (p. 168). Russell (1971) determined that the term, motivation, has three characteristics that surfaced in most definitions:

- It is a presumed internal force;
- It energizes for action; and
- It determines the direction of that action (p. 5).

Hamachek (1968) provided a similar list of factors affecting motivation, but with a slant toward motivation in learning. His list views motivation as a process that:

- Leads students into experiences in which learning can occur;
- Energizes and activates students and keeps them reasonably alert; and
- Keeps their attention focused in one direction at a time (p. 3).

The concept of being *energized* or *aroused* is prevalent in many of the definitions found in the literature. Learners who are energized are anticipated to act in a certain manner that keeps the learner moving in the direction of increasing knowledge (Qureshi, 2001; Arkes & Garske, 1982). Johnson and Johnson (1985) provide a perspective on motivation to learn in which they define motivation – "as the degree to which students commit effort to achieve academic goals (e.g., the intended learning benefits of increased understandings and skills) that they perceive as being meaningful and worthwhile" (p. 250). Keller and Burkman (1993) continue this behavioural perspective by noting that motivation defines that - "which determines the magnitude and direction of behaviour. Magnitude is generally regarded as degree of effort and direction is generally defined in terms of goal orientation" (p. 3). It is apparent from these definitions that there needs to be some mechanism within the instruction that will stimulate the learner into action and that will somehow maintain that stimulation over time. Simply arousing the learner in the introduction to a learning experience is not sufficient. The excitement of learning must be maintained throughout the learning experience. The ability to sustain interest throughout the learning experience then is the challenge for the instructional designer.

Locus of Control

Locus of control is a trait that reflects the extent to which an individual views their actions or inactions as affecting outcomes in their life. Persons who exhibit a strong internal locus of control believe that their success or failure is directly related to their own efforts and abilities. Whereas those with a strong external locus of control perceive events and factors affecting their lives as originating more out of luck or circumstances beyond their control than something they affect personally (Miltiadou & Savenye, 2003). As Abdul-Rahman (1994) notes – "locus of control is an attitudinal or belief variable that represents the individual's perception of the amount of personal or external control over life outcomes: it refers to an individual's inclination to attribute success or failure to himself or herself or to the external forces outside his or her control" (p. 31). The importance of locus of control in regards to increasing motivation through instructional design is found in the amount of control over the learning process the designer is prepared to provide to the learner. There are also elements of influence and reinforcement of the learner's activities at play in instructional design that can be affected depending on the learner's perceived locus of control (Keller, 1983).

Persistence

"Persistence is a synonym for student progress and refers to behaviour whereby students continue to make progress through a course or degree program by remaining continuously enrolled" (Kemp, 2001, p. 10).

Instructional Design

Smith and Ragan (1999) refer to instructional design as the systematic process of, "translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation" (p. 2). Several years earlier, Reigeluth (1983) wrote that confusion often existed in instructional design because of the attempt, as Smith and Ragan have done in their definition, to link learning theory with instructional development. Reigeluth speculated that there was a difference in the two processes because, as he explains, instructional development focuses on methods of instruction, whereas learning theory is directed at the process of learning. Instructional design, he contends, "is concerned with understanding, improving, and applying methods of instruction" (p. 7). Although there is little doubt that instructional design deals with methods of instruction, it is extremely important that these methods consider learning theory and how these theories might affect motivation when selecting the methods of instruction. For the purposes of this study, therefore, learning theory must be considered in the instructional design process if motivation is to be affected.

Intrinsic and Extrinsic Motivation

Intrinsic motivation is an important ingredient in the design of course materials for distance learning. It is intrinsic motivation that should be inherent in any learning activity if one of the goals of that activity is to motivate the learner. As Johnson and Johnson (1985) elaborate, intrinsic motivation is learning for – "the joy of it, to benefit others, and as the result of personally meaningful feedback are intrinsic to learning activities" (p. 260). Abdul-Rahman (1994) noted that Kember (1989) defined intrinsic motivation as

the interest learner's exhibit for the content of a course. Extrinsic motivation, on the other hand, is motivation toward attaining personal goals such as high grades or course completion and graduation. Extrinsic motivation focuses on the outcome of the learning experience more so than what the experience offers (Johnson & Johnson, 1985).

Self-Efficacy

Sandler (1998) notes three aspects of self-efficacy:

- It represents a composite of all life's past successes and failures experienced by an individual;
- Individuals will exhibit differences in their general self-efficacy expectations; and
- In general, self-efficacy ought to affect an individual's mastery expectations in a new situation (p. 42).

Self-efficacy is important, therefore, to the motivation learners might experience before beginning a learning experience and while engaged in a learning experience. It is important from the outset of a learning experience that students have a reasonable expectation of succeeding. Instructional designers can partially influence this expectancy by ensuring the tasks and assessment standards, which the learner will meet, are relevant and achievable by the anticipate learning community.

Summary

Chapter 1 introduced the topic of this thesis and provided the Research Questions that will be the focus of the research effort related to this thesis. These questions are repeated as follows:

1. Does the type of instructional design methodology used in course development affect learner motivation?
2. To what degree, if any, does varying the instructional design methodology affect locus of control, intrinsic and extrinsic motivation, and self-efficacy?

The chapter provided the assumptions of the study and the significance of this study on the body of knowledge related to the linkage between motivation and instructional design. The various terms to be used in the study were defined and the organization of the thesis outlined. The next chapter details the literature reviewed as part of this research effort and will provide a comprehensive review of the importance of motivation to learning and the manner in which motivation is linked to instructional design.

Organization of the Thesis

This thesis consists of five chapters beginning with the introduction just read. Chapter 2 provides a literature review focused on determining the importance of motivation to learning in general and more specifically to distance learning. It then considers in greater detail the individual elements of motivation reflected in locus of control, self-efficacy, and intrinsic and extrinsic motivation. A section is then dedicated to considering the attributes commonly found in adult learners, as it is adults who most often select distance learning as their learning methodology. The chapter concludes with an examination of the various instructional design elements that must be considered in constructing an instructional experience in which motivation is a primary consideration.

Chapter 3 considers the methodology used to conduct the research for this thesis. It provides an overview of the course and audience used in this research and then takes the many instructional design elements reviewed in Chapter 2 and formulates them into actual instruction instruments specifically intended to improve learner motivation. Data collection and analysis techniques are also presented. Chapter 4 examines the results of the research effort and Chapter 5 provides a conclusion and recommendations stemming from the overall thesis effort.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter reviews selected literature reflective of the effect motivation has on learning and the potential impact of instructional design on learner motivation. The chapter considers the importance of motivation for distance education in particular and then reviews the principle motivating elements that were examined while developing an instructional design philosophy. Next the chapter looks at characteristics of adult learners in a distance education. The chapter concludes by reviewing the effect of instructional design on motivation by examining several parts of the instructional design process that support the theory of improving learner motivation.

The Importance of Motivation

In this section of the literature review, elements and philosophies of motivation are introduced, particularly in the context of learner motivation. Providing a fundamental grounding in the theory of motivation is necessary for understanding of the linkage between instructional design and motivation.

Perhaps the most noted scholar on the subject of motivation in recent times is Abraham Maslow. Maslow undertook research in the early 1950s on the subject of motivation that later became the benchmark for future motivational studies. Maslow (1968) postulated that there is a hierarchy of needs that people must satisfy in search of life's fulfillment. Once needs of safety, belonging, love, respect, and self-esteem are met, people look to satisfy their need for self-actualization. At this point, they seek to

actualize their potential, capacities, and talents by developing a fuller knowledge of, "and acceptance of, the person's own intrinsic nature, as an increasing trend toward unity, integration or synergy within the person" (Maslow, 1968, p. 25). He noted that as people realize self-actualization and find gratification in their accomplishments, their motivation heightens and grows. Times become more exciting and opportunities for success and achievement are sought out rather than avoided. People who grow within themselves begin to want more and more for themselves, particularly in the area of learning and formal education.

Maslow later separated his hierarchy into two categories, deficiency motivation and growth motivation. He noted that once people have satisfied their motivational elements in the deficiency category, they are ready to move toward self-actualization in the growth motivational category (Russell, 1971). Self-actualized individuals are gratified in their basic needs and become far less dependent, far more self-directed, and far more autonomous than those functioning at a lower level in the motivational hierarchy (Maslow, 1968; Abdul-Rahman, 1994; Arkes & Garske 1982). Generally speaking, people who undertake distance learning have already arrived at the growth motivation level in their development by having satisfied their lower level needs. They are now ready to engage in efforts that will satisfy their need for self-actualization. It is the instructional designer's challenge to ensure this need for self-actualization is nurtured and allowed to grow.

A fundamental assumption of distance learning is that learners who chose to undertake studies at a distance are already motivated to place themselves in a learning situation (Gagné & Driscoll, 1988). As the act of learning continues over time, several

factors influence motivation to continue learning, not the least of which is the learning experience and the quality of the learning products experienced. Uhlig (2002) posits that distance learners must, by nature of the format through which they study, be self-motivated and self-disciplined. Because of the freedom and flexibility of a distance-learning environment, learners must be motivated to accept the tremendous commitment associated with distance learning. A sense of compulsiveness is a vital characteristic that drives distance learners to continue and to achieve.

Keller (1983) continues the theme of self-motivation by noting that distance and adult learners are already motivated to learn by virtue of the fact they self-select to engage in their studies: they make a conscious commitment to undertake distance studies. He also contends that learners choose distance learning over more traditional classroom-based learning because the latter does not satisfy their needs. Keller notes that some authors base their appreciation of why individuals select distance learning on the assumption of individual ability to engage in this particular mode of study. He disputes this assessment of individual characteristics noting, "motivation refers, in a general way, to what a person will do, whereas ability refers to what a person can do" (Keller, 1983, p. 388). The difference between *will do* and *can do* is subtle, but very important in the context of motivation. While a learner may have the potential to undertake distance learning (*can do*), they may not possess the motivation (*will do*) to subject themselves to this form of educational development. Keller and Burkman (1993) state that learner motivation colours all that follows in the learning event and therefore requires the attention of the instructional designer if learning is to be successful. They go on to note that motivation must be a consideration throughout the entire instructional design process

and not simply an embellishment selectively included at certain stages of the process. Keller (1983) further notes that motivation is affected by a myriad of influences that instructional designers would find almost impossible to account for in their entirety. Trying to categorize motivational characteristics into a “one-size fits all” format is an effort in futility and one that should be avoided. Each student entering a program of study will have experienced different life events, different social settings, different educational experiences, and will have different goals. However, this is not to suggest that instructional designers avoid attempts to address the spectrum of potential motivational characteristics. There are a number of immutable truths about what motivates people to study and to continue their studies that can be considered. However, instructional designers should not be discouraged or surprised if their efforts to incorporate motivational techniques in their learning products fail to appeal to some learners.

Achievement is a strong motivating influence. Individuals exhibiting the need to achieve require the ability to gain control through their own actions, to produce something meaningful. Gagné and Driscoll (1988) note that individuals exhibiting the need for achievement have been variously described as possessing a "universal positive motivation for competence and effectiveness" (p. 65), the desire to manipulate their environment in order to create something new or at the very least create change.

A distinct source of learner motivation is curiosity. Curiosity is aroused by novel stimuli that are complex and unpredictable (Gagné & Driscoll, 1988). To motivate learners, an arrangement of unusual, unfamiliar patterns should be presented. It is also useful to include pictures that stimulate the sense of vision while being pleasing to the eye or novel in their portrayal of events that relate to the topic under consideration. A

common difficulty that instructional designers experience in raising learner curiosity is the need to sustain this sense of arousal over the period of a lesson or module. To sustain curiosity, it is important not to stimulate at too great a level at the outset or to use only one mechanism. Variety is the key to motivating learners as they proceed through the learning process to conclusion.

A more focused aspect of motivation that is relevant to distance education is social cognitive learning theory. According to Miltiadou and Savenye (2003), there are six motivational constructs of social cognitive learning theory that can be grouped into the following three classifications:

- The first family refers to individuals' perceptions about their ability to accomplish a task. It includes constructs such as self-efficacy, locus of control, and attributions.
- The second family pertains to individuals' reasons or purposes for engaging in a task. It encompasses constructs such as goal orientation and intrinsic versus extrinsic motivation.
- The third family refers to individuals' techniques and strategies for accomplishing a task and includes self-regulation.

Appreciating the motivational attributes associated with social cognitive theory offers the instructional designer insight into the fundamental motivational characteristics of learners that are germane to the development their learning products. As Wlodkowski (1999) points out, if two people of identical ability decide to take the same course under identical conditions, the motivated person will invariably do better on the course than the unmotivated person. Attending to elements of social cognitive learning theory during instructional design can only result in a more motivated learner. These social cognitive

characteristics that affect learner motivation will be examined in greater detail later in this chapter.

Cannon (2001) postulates, however, that student motivation upon entering a program shapes their expectations for the content of the program and the support they expect to receive once engaged in the course of study. The suggestion being that an unmotivated learner experiencing a learning environment that does not cater to enhancing learner motivation will only serve to substantiate the learner's expectations. An earlier study conducted by Sung (1986) disputes Cannon's view in some respects by suggesting that entry-level motivation is less significant than the motivation instilled in learners once engaged in distance education. Sung found that the manner in which learners were treated while engaged in a distance education program -- the sense of responsiveness from the institution, the faculty, and the course content -- all served to shape their persistence in remaining in a distance education program and their beliefs in the effectiveness of distance education. Such debate over where motivation must reside in order to enhance the learning experience in distance education is undoubtedly moot. Certainly, motivation at both levels, before engagement and during engagement in learning, will serve to enhance the distance education experience and increase the likelihood of learners continuing both within a program of study and within distance education. In terms of the instructional designer's responsibilities in this equation, it is important that courseware developed for distance learning exhibit qualities that allow learners to "proceed toward meeting unmet needs, resolving unwanted conditions, or reaching desired goals, motives for learning" (Merriam & Caffarella, 1999, p. 397) in order to ensure attainment of experiences of success and satisfaction with distance education.

The value of improving learner motivation is not a revelation to those who instruct distance learners. Instructors have long recognized that motivation improves the learning experience and, in many respects, is a consequence of learning (Wlodkowski, 1999). When learners are motivated, communication between instructor and student flows smoothly, anxiety associated with learning decreases, and learning creativity and engagement is more in evidence. Learners who complete an exciting and rewarding learning experience leave "feeling motivated to seek future learning opportunities and to use what they have learned" (Wlodkowski, 1999, p. 5).

Perhaps the most all encompassing view of motivation in the context of learning is provided by Russell (1971). Although he uses the typical classroom environment to contextualize his summary of learner motivational elements, the same context can be applied to distance education. Russell determined the following:

- The motivation that produces behaviour is the result of a complex array of interrelated motives;
- A teacher cannot know the sources and levels of each motive but can observe the behaviour resulting from the totality;
- Natural tendencies of the student to imitate, explore, manipulate, and master his environment are the strongest motives available for school learning;
- Successful experience intensifies the anticipation and expectancy of future success, and this experience constitutes a major thrust into and through new learning;
- Setting goals and standards of excellence for themselves increases students' motivation for achievement;
- Students have characteristic arousal levels, which they seek to maintain;

- Increases and decreases in arousal level can be induced by controlled circumstances external to the learner;
- Motivation for school learning is a function of the student interacting with his environment, which includes all aspects of the school program as they touch him;
- Planned movement from extrinsic to intrinsic reinforcement can lead students into a love of learning;
- Teachers, in their modeling, planning, and conducting behaviours, exercise a significant influence upon student motivation (Russell, 1971, p. 97).

Certainly, the last point applies to instructional designers as well as teachers or instructors.

Keller (1983) contended that motivation is often not considered when designing approaches to instruction and is rarely considered an essential element of instructional design and instructional theory. Although Keller was disappointed to see a lack of attention paid to learner motivation in the design of learning products in the early 1980s, his message did not go unheeded as most instructional design texts today contain at least a few pages on the subject of learner motivation.

Dick, Carey, and Carey (2001), for example, pay considerable attention to several aspects of motivation and make extensive reference to the need for instructional designers to consider motivational elements in the design of learning products. They give particular emphasis to Keller's ARCS model, noting that the first aspect of providing motivational learning is to gain the learner's attention and to sustain that attention throughout the learning sequence. They suggest that motivation can be aroused through the use of

emotional or personal information, by asking questions, by providing mental challenges, and perhaps best of all, through the use of relevant examples.

In addition to gaining learner attention at the outset of a learning experience, Dick et al. (2001) also emphasize the importance of sustaining that attention by listening carefully to what learners are saying and determining what life experiences are relevant to them. This latter attribute is more pertinent to the actual instruction of distance learning than to the design of learning products, but it does point to the need for designers to have a thorough understanding of their target audience before setting to work on the instructional design process. Dick et al (2001) conclude their examination of Keller's ARCS model stating that "taken alone, any of the four aspects of Keller's model may not be sufficient to keep a learner on task in a learning situation. When you incorporate all four -- attention, relevance, confidence, and satisfaction -- into your strategy, the likelihood of maintaining the learner's interest is greatly increased" (p. 190).

Keller (1983) admits, however, that the distinction between conditions and methods can greatly affect the ability of installing motivational techniques in instructional design to influence learner motivation. He points out that there are two types of motivational problems, "those located within the individual (conditions) and those located within the instruction (method)" (p. 398). If the learner suffers from severe motivational problems, it is unlikely that even instructional materials designed with motivation in mind will be sufficient to deal with such learner problems. In the case of severe internal motivational problems, the intervention of an experienced counsellor is likely the best avenue to improving learner motivation.

Keller also draws a distinction between performance and effort when assessing learner motivation. Performance, he notes, is a measure of accomplishment, whereas effort is a determinant of the actions undertaken by the individual to accomplish the assigned task. Although performance provides an indication of knowledge gained, effort on the part of the learner is a much better indicator of motivation. Performance is a product of a variety of factors, including a combination of the motivational patterns and is, at best, a crude measure of motivation (Maehr, 1984).

More recently, Keller (2005) has turned a portion of his attention to the aspect of learner volition in relation to motivation. Keller notes that historically, motivation has been considered on two levels:

- The first is *will* which refers to a person's desires, wants, or purposes together with a belief about whether it is within one's power to satisfy the desire, or achieve the goal.
- The second level is the act of using the will, or *volition*, which refers to a process for converting intentions into actions (p. 9)

The distinction is between *will* and *action*. While a learner may be interested in engaging in a learning intervention, will he or she be sufficiently motivated to turn desire into the actual act of learning, and will he or she be sufficiently motivated to continue in that learning intervention once demonstrating a volition to learn. Keller points out that there generally needs to be some form of extrinsic motivator that will convert learner intentions or will into action or volition. Such extrinsic motivators are beyond the means of the instructional designer to control, but as Keller points out in quoting Kuhl (1985), whatever extrinsic motivator energized the learner to act needs to be nurtured during the learning intervention in order to sustain the learner's intended actions.

In sum, when learning is perceived to be relevant and meets the learner's needs, it is likely that learner motivation will increase. Accordingly, Gagné and Medsker (1996) suggest it is the responsibility of the instructional designer to determine what is most likely to motivate individual learners or learning groups, and then build learning activities that best satisfy these motives into the instructional design.

Motivational Elements that Instructional Design May Affect

Locus of control, self-efficacy, and intrinsic and extrinsic motivation are factors that instructional designers should consider in order to enhance overall learner motivation and, by extension, to improve the distance learning experience.

Locus of Control

Julian Rotter introduced the term "Locus of Control" in 1966 as a result of work conducted with the United States Air Force. Locus of control is essentially an individual's perception of where the control of events affecting one's life and social framework originates. People with an inherently focused internal locus of control believe that events affecting their lives are within their control to influence and are contingent on their behavior. Success for those with an internal locus of control is the result of personal initiatives, efforts, and abilities. On the other hand, people who perceive that events affecting their lives are beyond their control to influence exhibit an external locus of control (Keller, 1983; Gagné & Medsker, 1996). For such individuals, success is the result of luck, external circumstances, or the actions of other people. For someone with an external locus of control, there is a general lack of self-determination and often a feeling of pressure and tension. Consequently, when a learning environment includes

positive experiences, effectance-relevant feedback, and concern for the learner's performance, intrinsic motivation will be enhanced (Ryan et al., 1985).

Burns, Fraser, Kick, and Wang (1999) note that "contemporary and long-standing evidence" (p. 286) support the view that individuals exhibiting a strong internal locus of control are more highly motivated and generally perform better academically than those possessing a more externally focused locus of control. Miltiadour and Savenye (2003.) also note from work conducted by Parker (1994) that individuals exhibiting a strong internal locus of control tend to be more successful in a distance education environment than those with an external locus of control. While locus of control is a character trait that may be difficult to influence by varying the instructional design methodology of a course, it seems reasonable that attempting to provide learners with increased control over their learning experience will improve their motivation by catering to the learner's internal locus of control. Merrill (1994) postulates that locus of control depends on who does the adapting: the learner or the learning system. "In a learner-control model, the choice of the best display to be given next is made by the learner; however, in a system-control model, the choice of the best display to be given next is made for the learner" (p. 255). In fact, Militadou and Savenye (2003) note that control of learning positively affects motivation by raising learner expectancy of success through the belief that their effort to learn will result in positive outcomes. Similarly, control of learning influences learner perception of the value of learning, which in turn encourages students to take more interest in the learning content and process.

Developing content for a homogeneous group of learners possessing an internal locus of control would certainly be easier than developing similar content for those with

an external locus of control. As the literature highlights, learners with an internal locus of control are very likely already motivated. However, homogeneous groups of learners are rare. Therefore, the instructional designer must accommodate this diversity by including control and feedback mechanisms within the content that are relatively easy to use, that give learners a sense of direction and satisfaction from the learning experience, and that instill learner confidence (J. Keller, personal communication, November 23, 2005).

Self-Efficacy

Miltiadou and Savenye (2003), citing Bandura (1986), describe self-efficacy as an "individuals' confidence in their ability to control their thoughts, feelings, and actions, and therefore influence an outcome"(p. 6). They also note from studies conducted by Pintrich and De Groot (1990) that any improvement in student self-efficacy leads to increased use of cognitive and meta-cognitive strategies resulting in higher academic performance. Several researchers (Miltiadou & Savenye, 2003; Schunk & Parjares, 2002; Bandura, 1997) have established that those learners exhibiting a strong sense of self-efficacy have a greater chance of succeeding in an academic environment in comparison with learners possessing a diminished sense of self-efficacy. Gagné and Driscoll (1988) also note the learners can develop convictions that certain behaviour will produce a particular kind of performance outcome. They may know what behaviour is expected to achieve a good grade in a course "(outcome expectation), but believe they cannot successfully perform that behaviour (efficacy expectation)" (p. 65).

Unfortunately, the cultivation of a strong sense of self-efficacy begins at a very early age and relies on numerous life experiences for development. Consequently, it is

difficult for any individual instructor or instructional designer to significantly alter an already well developed sense of efficacy, particularly if past academic performance has not been generally positive. Schunk and Parjares (2002) suggest that one method instructional designers might use to enhance student self-efficacy is to set specific, short-term learning goals, that are viewed as challenging yet attainable within the student's perceived abilities. They note that timely performance feedback, particularly feedback that highlights student progress in achieving their learning goals, serves to strengthen self-efficacy and sustain motivation.

Bandura (1994) posits that social persuasion can have a very positive effect on self-efficacy by enlisting the confidence necessary for learners to succeed and by providing the mechanisms that will permit them to master assigned activities. Persuasion, particularly from the instructor, can also sustain motivation toward completion of course activities and bely self-doubts that learners might harbor regarding their ability to succeed with their studies. Bandura (1994) also notes that efficacy builds "structure situations [for learners] in ways that bring success and avoid placing [learners] in situations prematurely where they are likely to fail" (p. 72).

Bandura (1997) further expands upon the need to nurture self-efficacy, explaining that "most human motivation is cognitive" (p. 122) and that a positive or negative learning experience in the present can have lasting implications for future preferences. The impact for distance education, therefore, is that an early negative experience with distance education can have a lasting impact.

Bandura (1997) also draws a clear distinction between efficacy and locus of control, noting that self-efficacy relates to one's abilities to undertake certain activities,

whereas locus of control is concerned about whether one's actions can affect certain outcomes. For example, students may assess that they have the ability (efficacy) to complete a particular assignment satisfactorily, but may wonder if significant study will achieve the desired results (locus of control) given that they have fallen behind in their studies. Bandura notes that by virtue of this distinction, efficacy is a much better indicator of future behavior than locus of control, principally because ability can be determined to a certain extent from past performance. Locus of control, on the other hand, involves variables that may be beyond the learner's ability to affect. The instructional designer, however, can use an external locus of control to situate learning such that it positively impacts on the learner's efficacy and internal locus of control.

From an instructional design perspective then, anticipating or knowing a learner's potential efficacy can help determine the level of confidence building the designer must consider in the creation of learning content and delivery methodology. A learner population that traditionally exhibits considerable ability toward distance learning and the subject under consideration will require less confidence-building attributes in their learning content than someone who has demonstrated difficulty with or an aversion to distance education.

Intrinsic and Extrinsic Motivation

Intrinsic motivation stems from an inner sense of accomplishment that leads one to undertake activities often for the sheer joy of learning or doing. Jensen (1998) notes that most students are already intrinsically motivated; however, the motivation is very context dependent. He also suggested that any discussion about intrinsic motivation

needs to include the learner's search and subsequent construction of meaning from the learning content. People exhibiting intrinsic motivation do not necessarily need an exterior motive for their actions. For example, a skier experiencing the excitement and pleasure of rushing down a hillside through new fallen snow is intrinsically motivated. In contrast, a person experiencing extrinsic motivation undertakes a task for reasons that are rooted in attaining some required outcome. For example, the officers taking the Defence Management course described in detail in Chapter Three may be considered extrinsically motivated because completion of the course is a requirement for further progression in their career. Keller and Burkman state, however, that "extrinsic rewards help maintain motivation to learn repetitive material, or material that is in other ways intrinsically uninteresting" (p. 26). Consequently, while it would be best if all students were intrinsically motivated, there are occasions when the nature of course materials favour learners with a strong sense of extrinsic motivation.

Ryan and Deci (2000) have determined that instructors who are "autonomy supportive (in contrast to controlling)" (p. 70) instill in their students a greater sense of intrinsic motivation, curiosity, and desire for a challenge. The literature on the value of intrinsic or extrinsic motivation suggests that either motivating principle can be enhanced by an instructor who internalizes learning by showing that a relation exists to real world activities. While intrinsic motivation is ideally suited to learning, it is often unrealistic to suggest that students universally engage in learning solely for the joy of the experience, as there is usually some ulterior motive for learning beyond pure satisfaction. In fact, Ryan, Connell, and Deci (1985) argue that any event that facilitates the perception of an

"internal locus of causality" (p. 16) toward an activity is likely to enhance intrinsic motivation for that activity.

The Adult-Learner

Although this study deals with the subject of motivation, and more specifically, motivation in instructional design, it is useful to consider the subject of adult learners because the majority of distance education revolves around adult learners. In fact, past studies have determined that the majority of distance learners were working adults, primarily female (Roblyer, 1999). "USA Today (1999) found that five of every 11 students attending U.S. colleges and universities were 25 or older. They also predicted that the number of college students 35 and older would exceed the number of 18- and 19-year-old students in this decade. These students are adult by definition" (Qureshi, 2001, p. 31).

The main reason why distance education is attractive to adult learners is its inherent flexibility, particularly for those adult learners who are geographically removed from a suitable university or who are fully employed either at home or in the work place and must therefore pursue their education on a part-time basis (Wallace, 1996). Since many of these learners are fully employed, they tend to be older with less flexibility on where and when they are able to learn. Many adult distance-learning students identify reasons of economics, time flexibility, and geography as principal reasons for selecting distance learning as their preferred method of study (Brindley, 1987).

There are volumes written about the characteristics of adult learners; consequently, this review cannot possibly summarize the findings of these numerous

publications. Instead, the review will turn to the originator of the term "androgogy" for a summary of adult learner characteristics. In 1970, Malcolm Knowles published a text entitled *The Modern Practice of Adult Education* that has become the foundation for discussion on the subject of how adults learn. In this text, Knowles prescribes four crucial assumptions that characterize adult learners:

- they are self-directed;
- they bring a reservoir of experience to the learning environment;
- learning is oriented to tasks associated with social roles; and
- there is a need for immediate application of the learning material (Knowles, as cited in Fasig, 1982, p. 9).

It is important that those designing distance education courses, particularly those with a concern for learner motivation, appreciate these four characteristics. For although they are broad in context, these characteristics provide a basic framework around which courses can be developed that will enhance adult learner motivation to engage and continue in distance education.

Self-direction is a recurring theme in the literature related to adult learners who choose distance learning as their mode of educational development. Self-direction is considered a fundamental of adult learning (Murphy, 1995) and consequently an important consideration for instructional designers producing learning products intended for an adult learning audience. Wlodkowski (1999) notes that there are two basic assumptions to be made in understanding adult motivation:

- Adults have a self-concept of being responsible for their own lives...they develop a deep psychological need to be seen and treated by others as being capable of self-direction; and
- Adults become ready to learn those things they need to know or...to cope effectively with their real-life situations (pp. 10-11).

Wlodkowski (1999) goes on to note that adults generally arrive at distance learning with a positive attitude and high motivation, but these attributes can diminish quickly if learning is not found to be meaningful and rewarding. He emphasizes the need to make adult goals, interests, and perspectives a central theme of any distance learning design intended for an adult audience. A learning experience delivered in an engaging format concerning a relevant topic is "intrinsically motivating because it increases the range of conscious connections to those interests, applications and purposes" (Wlodkowski, 1999, p. 76) that are important to adult learners. Qureshi (2001) further emphasizes the need for concrete and immediate learning goals when he writes about adult learners as individuals who know "what is important to them and are frustrated when others impose their ideas of what is important" (p. 31).

It cannot be assumed, however, that adults arrive at distance learning experience already fully motivated (Gagné & Medsker, 1996). There are many factors that affect adult motivation toward learning, including past performance with learning, their current state of mind, and the perceived importance the impending learning activity holds for the adult learner. Still, adults who choose to engage in a distance learning experience will generally be easier to motivate than will their counterparts who perceive learning as a form of coercion or an ends to a means. Several research efforts have shown that four

motivational conditions substantially enhance adult motivation to learn: "inclusion, attitude, meaning, and competence" (Wlodkowski, 1999, p. 69). Wlodkowski (1999) also notes that adult learners generally recognize they are personally responsible for their life's activities and see responsibility as a significant motivator for the events they choose for themselves.

Interestingly, Sandler (1998) also highlights the ability to identify with an institution of higher learning as a source of motivation for adult learners. Identifying with an institution tends to increase their attitude of persistence and is likely to be a determining factor in a student's decision to re-enrol in a program of study. It would seem an institution's ability to project an image as a quality place to learn can greatly impact adult motivation to enrol at the institution.

Instructional Design and Motivation

An important characteristic of instructional design highlighted in the literature is the systems approach or Instructional Systems Design (ISD). "Instructional design is concerned with understanding, improving, and applying methods of instruction" (Reigeluth, 1983, p. 7). Gagné, Wagner, Golas, and Keller (2005) also suggest that instructional design's aim is to aide in learning not the process of teaching. They also advocate that instructional design is aimed at "intentional learning" as opposed to "incidental learning" (p. 2). Treating instructional design in a systematic approach ensures that the various functions of the process are not carried out intuitively, but rather are treated as issues or problems for which solutions must be identified. Rothwell and Kanas (1992) quoting Kaufman (1972) write that instructional design is – "a planned

process by which needs are identified, problems are selected, requirements for problem solutions are identified, solutions are chosen from alternatives, methods and means are obtained and implemented, results are evaluated, and required revisions to all or part of the system are made so that the needs are eliminated" (p. 9). Johnson and Johnson (1985), writing on the subject of instructional design, warn against subscribing to the technology fallacy in which the designer focuses on the technology to be used in delivering learning as the mechanism for exciting students to learn, rather than focusing on overall design strategies intended to motivate learners.

The methodology prescribed by the different ISD processes follow many of the same patterns. There is an analysis phase normally included at the outset of the process during which the need for a learning intervention is determined. During this stage, learner attributes are also assessed as a means of determining the most appropriate instructional process for the learning style of those subjected to the learning intervention. This phase is often referred to as a needs assessment or analysis. Rothwell and Kasanas (1992) refer to this phase as that which identifies, documents, and justifies gaps between what is valid now and what should be valid for any gaps in knowledge to be closed.

The next phase normally focuses on a design function through which the intended instructional piece is sculpted. This is perhaps the most critical phase of the process because the eventual shape and format of the instructional product is created during the design phase. Keller (1983) points out that during the design phase, consequences related to motivation are identified and combined with cognitive techniques to influence the eventual outcome of the instructional process. The blending of these two design considerations is critical to both the delivery methodology and to the educational value of

the instruction. Keller emphasizes the need to keep motivational and cognitive aspects of the design process in mind at all times and not allow influences of efficiency and effectiveness to subsume the overall process.

Following design is development in which the architectural framework created in the design phase is built into a learning product. Development is followed by some form of delivery process often undertaken in a trial setting for the first iteration to ensure a measure of quality control over the instructional product. This first iteration is evaluated to ensure it meets the goals and objectives set out in the original design and to allow for any alterations to the instructional product prior to the next and subsequent deliveries.

This basic structure is typical of most ISD processes advanced in the literature. Some processes add other elements or use different terminology, but all essentially follow the path described above in some fashion. Because this thesis seeks to link the importance of including motivational elements to the instructional design process, this section of Chapter 2 is dedicated to looking at various techniques and considerations found in the literature that highlight the need to provide motivating techniques in an instructional product. The section looks at Instructional Strategy, Learning Outcomes and Objectives, Pre- and Post-Tests, Keller's ARCS model, Media, and Feedback as the elements of the ISD design phase that prominently speak to motivational elements and techniques.

Instructional Strategy

Instructional strategy is a term used to describe various aspects of the sequencing and organizing content in the instructional product, determining learning activities, and

deciding how to deliver the learning content and activities (Dick et al, 2001). Rothwell and Kasana (1992) characterize instructional strategy as the development of a "blueprint" (p. 177) intended to illustrate how the desired outcomes of instruction will be achieved.

Once an instructional strategy has been created, it serves:

- "as a prescription to develop instructional materials;
- as a set of criteria to evaluate existing materials;
- as a set of criteria and a prescription to revise existing materials; or
- as a framework from which class lecture notes, interactive group exercises, and homework assignments can be planned" (Rothwell & Kasanas, 1992, p. 177).

Dick et al. (2001) advocate providing mechanisms in the strategy that link new content found in the instruction to knowledge already possessed by the learner. Providing such links creates a knowledge continuum that assists learning development and makes new learning relevant within the context of what is already known. When the link between prior and present learning is not obvious to the learner, the instructional designer must incorporate mechanisms to form the linkage.

An early step in developing an instructional strategy is determining the content sequence. Generally, content is sequenced through some form of hierarchy that moves from the known to unknown in increasing levels of difficulty or which follows some logical sequence such as a time line or linear continuum. It is often difficult to find a basis for correct sequencing of the entire set of topics for a course or set of courses other than a kind of "common-sense" logical ordering. Presumably, one wants to insure that prerequisite skills, knowledge and information that are necessary for subsequent topic have been previously learned (Gagné & Briggs, 1979).

Merrill (1994) suggest that sequencing refers to decisions about the order that different topics of a subject matter are presented to a student while synthesizing refers to ways of showing the interrelationships among those topics. He further notes that summarizing refers to ways of previewing and reviewing the topics that are taught. Each of these instructional strategies is important to reinforcing the learning experience for the student. Merrill (1994) explains that: “synthesizing is extremely important for most kinds of instruction because it makes the parts of the subject matter more meaningful to the student by showing their context - that is, by showing how they fit into a larger picture” (p. 80). Through the synthesizing process, designers provide students:

- better long-term retention;
- additional knowledge that is more valuable than segmented information;
- a more enjoyable learning experience; and
- higher motivation for the subject matter (Merrill, 1994).

Spitzer (1986) supports Merrill’s notion of summarizing by noting that such practice enhances understanding and retention of the material. Spitzer cautions that educators too often present critical course content without ever returning to that content in some form of summary. He suggests that summaries are best situated at the end of modules of learning intended to break large lesson structures into manageable chunks of learning. The intent then of sequencing, synthesizing and summarization are to contextualize learning in a manner that is more likely to move that learning to long term memory and to make it more retrievable on demand by the learner.

It is also useful to cluster instruction into like components organized around the various objectives detailed for the learning activity (Dick et al, 2001). Smith and Ragan

(1999) refer to sequencing as an organizational strategy focusing on what content will be delivered and how the content will be presented. They differentiate organizational strategy related to the actual content from the delivery strategy and management strategy, which deal specifically with managing the medium, scheduling the delivery, and allocating resources to implement the instruction. Obviously, it is important to detail the manner in which all elements associated with sequencing learning will occur to ensure that the learners can visualize and appreciate how the learning will be delivered and the rationale behind the organizational strategy.

Once a sequence for the structuring the learning is determined it is necessary to ensure the structure or organization of the learning elements are clearly portrayed to the learner. Topics and sub-topics need to be identified through the use of some form of numbering convention or the manner in which headings are structured within the learning content. Keller and Burkman (1993) suggest the use of “text organizers” to make sure the relationship between text elements such as illustrations and blocks of text are clearly identifiable by the learner. Text organizers are devices that graphic designers use to make the structure of text explicit. Headings, typographic cuing, and use of white space on a page are examples of text organizers. Graphic designers often favour using a fairly spacious or open text display through the use of pages in which type consumes only part of the total space with the rest devoted to white space and, if appropriate, graphics that are used as text organizers, to add meaning to the text, and to prevent monotony. Keller and Burkman (1993) suggest the use of text organizers make the context of the text easier to follow and understand, and make the display of the text more aesthetically pleasing and consequently more attractive to the reader.

Another important consideration in developing the instructional strategy is considering the learning styles of those who will engage in the learning experience and clearly defining the target audience for the instruction. If the target group is not clearly defined it is quite likely that the designer will experience problems with the design (Harrison, 1999). Hamachek (1968) postulates that most learning styles can be categorized as mainly visual (reading), aural (listening), or physical (doing things), with the possibility of more than one style being used at a time. As Rothwell and Kanas (1992) note, Gagné, Briggs, and Wager (1988) have expanded on this basic breakdown of learning styles into what could be referred to as categories of learning outcomes. These categories include "intellectual skills, cognitive skills, verbal information, motor skills, and attitude" (p. 129). Intellectual skills are those such as reading, writing, and computing as well as the performance of specialized tasks. Cognitive skills are generally those skills associated with learning how to learn. . Verbal information is linked to what is learned in a course and the kind of knowledge adults should be able to readily recall (Gagné & Briggs, 1979). Motor skills are associated with body movement over a broad range of activities and require a certain degree of dexterity. Attitude is a person's positive or negative approach toward a thing or situation. A review of several authors (Dick et al, 2001; Smith & Ragan, 1999; and Gagné & Briggs, 1979) on the subject of instructional design revealed the previously mentioned five categories of learning as the basis for structuring learning products.

Together with learning styles and learning outcome formats, instructional strategies should also consider the instructional models upon which learning materials will be based. A number of learning models have surfaced over the years, but those most

commonly used include behaviourist, cognitivist, and constructivist approaches. To the behaviourist adherent, learning occurs around the communication process and is the result of a discernable change in the behaviour of the learner (Rothwell & Kasanas, 1992). Instruction is designed to manipulate learning variables into a predetermined change in learner behaviour at the end of the learning process. Cognitivists advocate that the mind is not simply a receptacle into which knowledge is poured for the purpose of achieving a predetermined change in behaviour. "Rather, the thinking person interprets sensations and gives meaning to the events that impinge upon his consciousness" (Merriam & Caffarella, 1999, p. 253). Constructivists believe that learning is a process in which learners construct their own meaning from materials and experiences presented to them during the learning process. Learners make sense of their experiences. "The constructivist will argue that the student situates the learning experience within his or her own experience and that the goal of instruction is not to teach information, but to create situations so that students can interpret information for their own understanding" (Heinich, Molenda, Russell, & Smaldino, 1999, p.17). Most designers today adhere to cognitivist or constructivist techniques noting that learners must be active in the learning process to enhance learner motivation. The difference in the two design techniques depends on what Smith and Ragan (1999) refer to as the amount of "scaffolding, support, or prompting" (p. 125) the designer is prepared to present to the learner in guiding the learning process.

Establishing motivational elements in the instructional strategy is accomplished by creating expectancy and anticipation in the learning materials. Expectancy can be established by telling learners what they can expect to happen as a consequence of their

learning activities and what is expected of them as they progress through their learning (Gagné & Driscoll, 1988). A highly supported principle in instructional design is that students will learn more effectively if they have advance information that helps them focus their study on the concepts and skills that ultimately will be tested (Keller & Burkman, 1993).

Robert Gagné is another noted researcher who along with John Keller brought the concept of motivation to the consciousness of many instructional designers. Keller's ARCS model will be covered in detail later in this Chapter; however, it is worth providing an overview of the motivational model advocated by Gagné to illustrate similarities between the two models. Table 1 below shows the nine instructional elements advocated by Gagné and instructional techniques that might be used to promote each instructional technique.

Table 1- Internal Process and Their Corresponding Instructional Events with Action Examples (Gagne & Medsker, 1996, p. 140)

Internal Process (Learner)	Instructional Event (Gagné)	Potential Action
Reception	1. Gain Attention	Use abrupt stimulus change
Expectance	2. Inform learners of the objective	Tell learners what they will be able to do after learning
Retrieval to Working Memory	3. Stimulate recall or prior learning	Ask for recall of previously learned knowledge or skills
Selective Perception	4. Present the content	Display the content with distinct features
Semantic encoding	5. Provide 'learning guidance'	Suggest a meaningful organization
Responding	6. Elicit performance	Ask learner to perform
Reinforcement	7. Provide feedback	Give informative feedback
Retrieval and reinforcement	8. Assess performance	Require additional learner performance with feedback
Retrieval and generalization	9. Enhance retention and transfer	Provide varied practice and spaced reviews

Gagné's instructional events listed in Table 1 offer but one strategy that might be considered in the design of instructional products with motivation as a clear and unequivocal consideration. There is, however, as Rothwell and Kanas (1992) point out, no one strategy that works well under all conditions and as a consequence, instructional designers should take a holistic view of the ISD process to ensure all aspects of the learning environment are considered. In other words, keep an open mind. Gagné et al. (2005) also note that instructional design must include input from potential learners. In order to determine what instructional methodologies work and which do not. They suggest that designers do not design “perfect instruction; they perfect instructional designs” (p. 3). The next section considers how the instructional designer might construct the element that informs learners what they are about to study, the learning outcomes, and learning objectives.

Learning Outcomes and Objectives

Learning outcomes and learning objectives are often the first concrete evidence in a course or lesson of what learners will encounter and what is expected of them as they make their way through the learning materials. Terminology, however, is often difficult to decipher when it comes to outcomes and objectives, as authors have a tendency to use different terms for these two learning components. Regardless of the terminology used, the basic premise of outcomes and objectives remains fairly constant.

Dick, Carey and Carey (2001) use the term “instructional goal” while Smith and Ragan (1999) talk about “learning goals” in a context that can also be referred to as a

course or program aim. Learning outcomes and learning objectives provide clarity to the goal or aim and help describe what learners should be able to do on conclusion of the instruction. They describe in a real-world context the purpose or intention of the instruction. Learning outcomes are important, because as Smith and Ragan (1999) point out, outcomes shape the instructional strategy that will be used for the learning intervention. They also note that outcomes are rarely written for instruction smaller than a lesson and, in fact, are more likely situated for a module containing one or more lessons covering a similar theme. Rothwell and Kazanas (1992) citing Mager (1972), often considered the father of learning outcomes and learning objectives, note that outcomes are "warm fuzzies because they sound desirable (warm) but are so vague (fuzzy) that achieving them is unclear" (p. 125). To become measurable, outcomes must be translated into more specific objectives that focus the learning to come and the assessment structure that will measure learning achieved. For the sake of discussion in this thesis, the terms "learning outcomes" and "learning objectives" will be used.

According to Rothwell and Kasanas (1992), a learning objective describes what learners should be able to do upon completion of instruction. Keller and Burkman (1993) also note that: "informing students of the goals or objectives can have an attention-getting, or energizing, effect as well as an attention-focusing, or information-acquisition, effect: furthermore, the motivational effect can be positive or negative depending on how the objectives are presented and how they relate to the learner's expectations" (p. 4). Learning objectives must focus on the instructional outputs and the desired effects on the learners as opposed to what the instructional designers would like to do with the activities in the instruction. A learning objective differs from a learning outcome in that it is

measurable. Dick et al. (2001) note that Gagné described a four part-learning objective that included the following:

- the stimulus situation that initiates the performance (i.e. the conditions);
- an action word or verb (e.g., 'writes');
- a word denoting the object acted upon (e.g., research paper); and
- a phrase that indicates the characteristics of a performance that determine its correctness (i.e., criteria) (p. 124).

Given this format then, a learning objective might look something like – “Given 15 multiplication problems in which the multiplier is a decimal with one, two, or three decimal places (the conditions), the learner will solve (action) at least 12 (object acted upon) of them correctly (criteria).”

While the basic format determined by Gagné holds for most learning objectives, Smith and Ragan (1999) point out that depending on the type of learning outcome desired, the format, or more precisely the detail, of the learning objective will change. Consequently, a learning objective written for a declarative knowledge outcome will use wording that is different than a learning objective written for a psychomotor skill or attitude outcome. A learning objective for a declarative knowledge outcome might read: "Learners will summarize the principal protections to individual liberties provided under the Bill of Rights" (Smith & Ragan, 1999, p. 86). In this objective the 'conditions' are understood to be 'on completion of the lesson' which some instructional designers choose to include in the learning objective statement, but which Smith and Ragan consider unnecessary unless there is a need to set the condition for clarity's sake.

One point all authors agree upon is the need to write learning objectives that are assessable. It is important, therefore, that the verb selected for the learning objective be translatable into some form of assessment vehicle. Gagné and Briggs (1979) emphasize the critical importance of choosing the correct verb to avoid ambiguity and to reliably communicate to any reader the performance desired on completion of the learning intervention. Therefore, if the learning objective verb states that the learner will 'describe' or 'list' or 'assess' some feature of the learning, the assessment structure must be developed in a manner that supports the verb selected. If it does not, the linkage between learning objective and assessment structure is broken and the value of the learning objective diminished. Smith and Ragan (1999) also emphasize that "you must develop objectives and related test items that reflect as closely as possible the original intent represented by the [outcome]" (p. 96). In other words, there must be a direct link between all three elements of the instructional intervention.

A principal reason for writing clear and focused learning objectives is to stimulate learner interest and begin the process of attending to Keller's first element of the ARCS model – Attention. Several authors (Dick et al, 2001; Smith & Ragan, 1999; Sung, 1986; Wlodkowski, 1999) repeatedly emphasize the importance of learning objectives as a tool to help students focus their study strategies, to energize students to accomplish the learning task ahead, and to realize the achievability of what is to be learned rather than overwhelming the learner. Wlodkowski (1999) characterizes the importance of the learning objective by stating, "without it [the learning objective], the motivation of the learners has no direction" (p. 303). Dick et al. (2001) caution that instructional designers should not assume that learners will be interested in the topic of instruction, or find it

relevant or interesting. Therefore, students must be stimulated into action through well-written learning objectives. Dick et al. conclude their discussion on learning objectives by pointing out that students are "more likely to attend to three to five major objectives than to a lengthy list of subordinate objectives" (p. 132) and that keeping the list of objectives manageable builds learner confidence that might otherwise be shattered by a long list of objectives. In sum, the provision of well-written, concise learning objectives forms the first component of learner motivation to the forthcoming instruction and should never be taken lightly or constructed without considerable appreciation for what the instructional designer wants to achieve through the instructional intervention.

Pre-test and Post Test

Pre-tests are often administered to learners as a means of determining the extent of knowledge already possessed by the learner that might be repeated in the instructional intervention about to be administered. As Dick et al. (2001) note, it is rare that learners will be completely unaware of the topic to be taught. They also emphasize the importance of building on prior understanding that can only be assessed through some form of pre-assessment to instruction. Wong and Raulerson (1974) prefer the term "pre-assessment" because as they point out this form of determining learner knowledge at the outset of an instructional intervention can be accomplished in a number of ways other than testing. They suggest that regardless of the title used for this first indicator of learner knowledge it should be conducted in a systematic manner such that later assessments can be used in a comparative analysis of learning actually acquired and not simply assumed to have occurred. Rothwell and Kasanas (1992) as well as Smith and Ragan (1999) also

point out that pre-testing helps instructors channel learners to the appropriate point in the instruction and helps avoid redundancy in learning. It is also a mechanism for increasing learner motivation by raising learner interest in what is to be learned and by providing an indication, in addition to the learning objectives, of what learning lies ahead. Keller and Burkman (1993) also highlight the motivational aspect pre-tests or pre-questions can bring the learning experience by noting that such questions raise expectancy and focus learners on the relevant content that will be presented in the lesson. Dick et al. (2001) point out, however, that a pre-test is not always necessary. If the instructional designer knows in advance that the majority of material to be covered in the lesson is likely new to the target population and their performance on a pre-test would likely be the result of random guessing, it would be best to avoid the pre-test and use some other mechanism to focus and motivate the learners.

Unlike the pre-test, the post test is an assessment tool intended to measure whether or not the learning objectives stated at the beginning of the instruction have been achieved. Smith and Ragan (1999) suggest that an objective-based assessment should satisfy the requirements of congruence, completeness, consistency, confidence, and cost, and can be tested for validity against the learning objectives if:

- its individual items are consistent with the outcomes or objectives they claim to assess (congruence, consistency);
- the items for each objective are representative of the range of items that are possible to develop for that objective (completeness); and
- objectives upon which the instrument is based are adequately sampled (completeness) (p. 95).

Dick et al. (2001) comment on the dilemma confronting instructional designers regarding the number of assessment items needed to adequately assess the learning objectives. They note that there is no easy answer to this question, but suggest determining the desired level of learning to be achieved by the instruction will provide some guidance in this regard. If mastery of the instruction is desired, the number and type of assessment items used will be quite different than if comprehension is intended as an outcome.

Keller's ARCS Model

As noted previously, John Keller is perhaps the most often quoted author of theories directly related to motivation through instructional design. Keller began his work in the early 1980s in realization that little if any study had been conducted on the relationship between motivation and instructional design. Keller's research resulted in the determination of four design categories for which he developed strategies aimed at ensuring the inclusion of motivation in the ISD process. The four categories devised by Keller are as follows:

- Interest refers to whether the learner's curiosity is aroused and whether this arousal is sustained appropriately over time;
- Relevance refers to the learner's perception of personal need satisfaction in relation to the instruction, or whether a highly desired goal is perceived to be related to the instructional activity;
- Expectancy refers to the perceived likelihood of success and the extent to which success is under learner control; and

- Satisfaction refers to the combination of extrinsic rewards and intrinsic motivation, and whether these are compatible with the learner's anticipations (Keller, 1983, p. 395).

These four categories were eventually translated into the ARCS model of instructional design in which Interest was changed to 'Attention' and Expectancy to 'Confidence' with Relevance and Satisfaction retaining their title. There is also a direct link between the three motivational elements (locus of control, self-efficacy, and intrinsic and extrinsic motivation) described earlier in this Chapter and the four categories of the ARCS model. Locus of Control and Self-Efficacy, for example, fall within the “Confidence” category. Increasing learner confidence will invariably give learners a sense they can control the events affecting their learning as well as improving their efficacy expectation, which is directly linked to learner confidence. Intrinsic and Extrinsic Motivation are linked directly to Satisfaction. "That is, if a student is already intrinsically motivated, it is important to use extrinsic rewards in such a way that they do not diminish intrinsic motivation. In the relevance category, it is desirable to connect the content of your instruction to intrinsic interests of the students and to then design outcomes that reinforce intrinsic satisfaction" (J. Keller, personal communication, November 23, 2005). This section of Chapter 2 will examine each of the four categories of the ARCS model in detail with the intent of surfacing instructional strategies that can be translated to the instructional methodology used in Chapter 3.

Attention

Gagne and Driscoll (1988) detail three actions that can be used to enhance learner attention. These are:

- vary the appearance or sound of instructional materials;
- use concrete examples for every abstraction that is presented; and
- surprise the learner with novelty and incongruity (p. 72).

The intent of these actions is to avoid designing instruction that becomes mundane or predictable for the learner. Many authors caution, however, of becoming too creative to the point the learner becomes confused with too much “flash,” particularly with actions intended to stimulate the perceptual curiosity of the learner. Keller (1983) notes that while some perceptual curiosity intended to create a sensory-level reaction is useful, it does not have as meaningful an effect as does raising epistemic curiosity. Epistemic curiosity refers to information seeking and problem-solving behaviour that result when the learner's cognitive, rather than sensory, path is stimulated. Keller notes that epistemic curiosity is more difficult for the educator to sustain, but is far more educationally meaningful than is perceptual curiosity. Gagne and Medsker (1996) suggest that the first consideration for establishing epistemic curiosity is the development of clear outcomes, objectives, and success criteria. Clarity, they point out, "reduces fear born of ambiguity" (p. 177). They suggest breaking complex objectives into more manageable sub-objectives, which are then associated with chunked parcels of learning.

Strategies recommended by Keller (1983) to gain learner attention and raise curiosity include asking questions or making a statement that creates an unusual perspective in the mind of the learner. The intent of the question or statement is to put the

learner in a problem-solving mode that raises cognitive activity. He also suggests using anecdotes to create an emotional element in what would otherwise be purely intellectual material. People, Keller notes, are more interested in the concrete than the abstract, and prefer personal language that gives the impression the lesson is talking directly to the learner rather than to some innocuous individual.

Another strategy recommended by Keller is the use of some material familiar to the learner that can be extended into the unfamiliar. He notes that people like to learn more about things already familiar to them. He also suggests developing epistemic curiosity through the use of synectics. Synectics is defined as "the free and unrestrained exchange of ideas among a group of people used as a method of developing new ideas" (Barnhart & Barnhart, 1986, p. 2128). Discussion forums and chat rooms ideally lend themselves to synectic interactions under the watchful eye of the instructor. Keller (1983) suggests that synectics can be used to help make the "strange familiar and the familiar strange" (p. 403).

The final strategy for maintaining learner attention suggested by Keller (1983) is to use inquiry as a means of fostering epistemic curiosity. Inquiry learning is intended to help learners further develop cognitive skills by having them seek out answers to questions themselves rather than having the answers provided. With this strategy, learners are provided with some investigative techniques and then allowed to search for answers to specific questions with the instructor's guidance. The instructor's role is to maintain learner curiosity and to resolve learner frustration in the event the learner becomes confused or overwhelmed while searching for answers to questions presented.

The intent of gaining and maintaining learner attention is to stimulate and challenge the learner's cognitive functions -- to not just inform the learner, but to help the learner learn how to learn. Using techniques intended to maintain learner curiosity help learners discover new ideas and knowledge, and improve their critical thinking skills.

Relevance

Keller (1983) suggests that learners need to perceive that important personal needs are being met by the learning situation if motivation is to be sustained over the long term. Important personal needs translate into the relevance of the current learning experience to past experiences and to what learners consider worthwhile in the future. Strategies suggested by Gagné and Driscoll (1988) for assuring instructional relevance include the following:

- ensuring that content relates to the learner's past experience and stored knowledge;
- explaining the present worth of the skills, knowledge, and attitudes being learned; and
- taking steps to convince the learner of the value of what is learned for future activities that are valued (p. 73)

Personal needs related to relevance can be enhanced by showing learners that their success is a direct consequence of their efforts when a moderate degree of risk is involved in the learning process and adequate feedback is provided attesting to the learners' efforts. Slight competition can also help heighten the learner's sense of accomplishment (Keller, 1983), and by extension, intrinsic motivation. Care needs to be taken with the introduction of competition, however, to ensure much stronger students do not disenfranchise weaker students during the learning experience.

Providing students with a measure of control over their learning can also help increase the relevance of what is being learned. Providing choice and allowing students to take responsibility for their learning gives them a sense of pride for accomplishments and achievement. Learner control, however, conjures up different meanings depending on the perspective of the individual designer. Merrill (1994) defines content control as the selection and sequencing of externally stated objectives while display control is the selection and sequencing of externally presented displays. He suggests that the term “learner control” also involves the ability of the learner to select and use a variety of internal processing strategies that permit interaction with the instructional product.

Learners appreciate having power over their learning although educators have been careful not to introduce power struggles through inappropriate use of authority on the part of the designer or instructor (Keller, 1983). Examples of excessive power are the provision of unsolicited help or influence exerted on learners by designers and instructors that runs counter to established learning outcomes and objectives.

The final strategy suggested by Keller (1983) to enhance relevance is to provide opportunities for no-risk, cooperative interaction. Learners need to feel a sense of affiliation with the course materials and other students in the course. Affiliation can be achieved by introducing non-competitive activities that help students establish friendly relationships with other students and the instructor. Although perhaps in conflict with establishing the slight competitive approach to learning suggested earlier, opportunities and techniques can be used that cater to both strategies without creating undue conflict among students or between student and instructor.

Confidence

To build learner confidence, Gagné and Medsker (1996) advocate attribution moulding intended to reinforce the notion that successful learning depends, in large part, on effort and learning strategies as opposed to external forces. They suggest allowing learners to assume a certain measure of control over their learning as a means of enhancing self-attribution and, by extension, promoting an internal locus of control and self-efficacy. Gagné and Driscoll (1988) suggest the following strategies to promote learner confidence:

- communicate clear and definite learning objectives;
- sequence successive lessons or learning tasks so that each can be readily mastered;
and
- permit learners to take an increasing degree of control over the sequence of learning and over the attainment of successful outcomes (p. 75).

Gagné and Medsker (1996) also suggest creating a challenging setting in which learners "perform something that they are not quite capable of performing on their own, but can perform with assistance or practice" (p. 177). Keller (1983) cautions, however, that the learning situation should begin with activities that relax students and build confidence early in the learning process. He also suggests instructors make an effort at the outset of a learning situation to establish personal contact with the learner as a means of putting the learner at ease. Personal motivation increases with personal expectancy for success, a character trait that is affected in large part by success or failure with previous learning experiences, locus of control, and personal causation (Keller, 1983).

Instructional design strategies intended to enhance the learners' confidence and sense of control include the provision of advance organizers and clear learning objectives. Comparative organizers can be used to integrate new material with familiar material so that learners are able to draw relationships between the two and better comprehend the new material and also see the relevance of the new material. Expository organizers are used to address unfamiliar material by examining its structure, and breaking it down into component parts, each of which is explained and related to adjoining parts of the overall structure (Keller, 1983).

Feedback is an important element for building learner confidence, but not just any feedback. Feedback must emphasize the relationship between learner effort and the results achieved. If it is evident the learner put great effort into a particular assessment vehicle, but achieved poor results, the feedback resulting from this assessment must balance the need for critique with acknowledgement of the effort expended by the learner. Keller (1983) points out that the feedback should endeavour to increase learner expectancy for success by providing suggestions on how the same amount of effort can improve results by using certain techniques unknown to the learner.

Satisfaction

Gagné and Driscoll (1988) suggest that attainment of learner satisfaction is perhaps the easiest of the ARCS components to achieve. Satisfaction is attained using feedback to bring about reinforcement. By using a thorough feedback process with many learning iterations, satisfaction with a single learning experience "develops into a self-management skill (actually, a cognitive strategy) that gives support to learner confidence,

maintains attention, and the relation of learning activities to long-term goals" (Gagné & Driscoll, 1988, p. 77). Gagné and Medsker (1996) again note the importance of establishing clear learning objectives at the outset of learning and the negative impact on learner motivation that can occur if those objectives are inconsistent with what is provided in the accompanying instruction. They also suggest providing instruction as close as possible to the direct application of that instruction so the knowledge or training gained can be employed immediately.

Intrinsic satisfaction with learning occurs if instruction uses task-endogenous, rather than task-exogenous, rewards. Keller (1983) citing Condry (1977) and Bates (1979) notes that endogenous rewards tend not to be seen as manipulating the learner and therefore cater to the learner's intrinsic motivation. Endogenous rewards flow naturally from instruction, such as would typically be found with feedback provided for an assignment included with the instruction. Exogenous rewards, on the other hand, are not directly related to the task and are generally provided as a method of coercion to elicit certain behaviour from the learner. An example of an exogenous reward would be promising participation in a field trip if a certain grade were achieved on a test.

Keller (1983) also suggests using "verbal praise and informative feedback rather than threats, surveillance, or external performance evaluation" (p. 426) in order to maintain intrinsic motivation and satisfaction. Verbal praise and informative feedback tend to increase the learners' appreciation of what they are learning and reduces the threat of implied punitive action should performance not meet instructor expectations. Keller also suggests that informative feedback be provided as close as possible to the response to which it applies in order to give greater meaning and influence to the feedback.

Media

Media selection is a very important consideration in determining how a learning intervention will be presented to those who will eventually use the instruction. Today, media relies heavily on technology to transmit and present instruction. However, technology does not always add learning value to the instruction and can, in some cases, have a detrimental learning effect if learners have difficulty understanding the technology or problems arise when the technology is used.

Heinich et al. (1999) define medium (plural, media) “as a channel of communication. Derived from the Latin word meaning "between," the term refers to anything that carries information between a source and a receiver” (p. 8). Examples include video, television, diagrams, printed materials, computers, and instructors. These are considered instructional media when they carry messages with an instructional purpose. The purpose of media is to facilitate communication. Bates and Pool (2003) define media objects that "can be analyzed in terms of their cognitively relevant capabilities and attributes" (p. 48). They classify such entities as speech, writing, drama, radio and television programming, computer programming, and Web-based courses as media. Rothwell and Kasantas (1992) define media as the "materials, devices, and people through which information is delivered" (p. 185). Therefore, media can be something that communicates, regardless of the technology used to provide the transmission. Writing, therefore, whether transmitted through a book or on a computer screen, is a form of media. Multi-media are defined as one or more media combined to send a message to the recipient; for example, the combination of speaking and pictures, or writing and graphs, can be considered a multi-media presentation. Mayer (2001) cautions that the goal of

multi-media presentations should not be to expose learners to vast amounts of information but rather to help learners develop an understanding of important aspects in the material being presented. In other words, multi-media should be used to explore an element of learning from different perspectives and not as a vehicle to bombard the learner with large amounts of the same information. Mayer also points out that learning depends on the quality of instructional message and not the media selected to transmit that message. Wong and Raulerson (1974) support Mayer's premise that media are of secondary importance to the learning experience by suggesting that: "a medium is only the means or mechanism by which a message is communicated to one or more of the learner's sense. While it may be possible for certain emotional responses to be conditioned to a medium there is no magic in the medium except as it is chosen to best communicate a message" (p. 43).

The selection of the most appropriate media for a particular learning intervention depends upon several factors such as: availability of various media to a particular instructional environment; the ability of the designer or availability of an expert to produce the media; the flexibility, durability and convenience of the materials; and the cost-effectiveness of the materials over the long run (Dick et al., 2001). Bates (2000) explains that the reason why print is such a popular media is its flexibility and ease of development. Print can be delivered on a computer screen or on paper. It is universally recognizable and can be delivered in numerous formats and languages. Bates notes that the use of print in distance learning is different from other forms of writing by virtue of the deliberate attempt to structure the text in a form that will elicit a particular response from the learner. Writing for distance learning is characterized by features such as:

- detailed objectives expressed in measurable outcomes;
- a system of headings and sub-headings that make the structure of the text explicit;
- self-assessment questions within the text;
- activities and model responses;
- summaries;
- examination or assessment questions;
- model answers to exam questions (Bates, 2000, p. 120)

Bates (2000) also emphasizes the importance of the instructor to assist students when learning from texts, to help clarify information provided through other media, and to provide feedback to students studying at a distance.

When choosing what media to use, it is important to consider the desired outcomes of the instruction and the time constraints, technology, and staff skills available to create and deliver the media (Rothwell & Kasanas, 1992). Delivery mode is another important consideration. There is little point designing instruction that contains large files or requires large bandwidth if the end user is using a dial-up modem to access the Internet. Likewise, it is pointless to develop media for electronic delivery if the end users do not have access to computers. Conducting a comprehensive needs analysis at the outset of the instructional design effort will help avoid pitfalls of selecting an inappropriate media or mode of delivery.

Feedback

The importance of timely and constructive feedback to the promotion and maintenance of learner motivation has already been mentioned. However, the importance of this motivational tool cannot be over emphasized and deserves further examination.

Keller (1983) makes a distinction between motivational feedback, which should be delivered immediately following a related performance, and formative feedback, which should be delivered before the next performance so the feedback will be useful. Motivational feedback relates to those elements affecting learner control, self-efficacy, and intrinsic motivation. It deals extensively with encouraging the learner as well as providing constructive criticism. It is important to ensure learners understand that their efforts were appreciated and that although the results may not be exactly in keeping with those expected, continuation of the level of effort exhibited should help improve those results. Formative feedback is more productive if it falls closer to the next iteration of a similar event. For example, if a learner experiences difficulty with grammar, providing feedback on those areas of weakness in grammatical construction immediately prior to the next writing exercise is likely to have more impact than if the same feedback is provided following the previous writing exercise.

Keller and Burkman (1993) stress that during the learning process it is very demotivating for learners to never know how well they are performing. People with a high need for achievement, who are already intrinsically motivated, have a strong desire for feedback regarding how well they are progressing. Keller and Burkman distinguish between confirmational and corrective feedback. Confirmational feedback, they note, is intended to tell learners when they are correct, and has been shown to have a beneficial influence on learning when the correct response is not self-evident. Corrective feedback, on the other hand, informs the learner of what is wrong with a response, not just that it is wrong.

In a similar vein, Dick et al. (2001) emphasize that feedback should be balanced, focusing on both successes and failures in performance. Highlighting only the negative aspects of performance can have a detrimental affect on learner motivation. When errors are committed, learners require feedback that points directly to the nature of the error. They also need feedback on what they did correctly, even if only a few elements of their work deserve praise.

Summary

This chapter provided an overview of the literature consulted during this thesis research. It began with a review of motivation as a human characteristic, noting that when basic needs are attained, people normally look to self-actualization and, in particular, to educational opportunities. Three elements of motivation were reviewed: locus of control; self-efficacy; and intrinsic/extrinsic motivation. Each has important attributes that affect learners engaged in distance learning, and each deserves the attention of instructional designers interested in promoting aspects of learner motivation in their learning products.

The chapter then explored each of the motivational elements considered important to distance education in greater detail. Locus of control refers to the learner's appreciation of where control over the learning experience resides. Learners with an internal locus of control prefer to have as much control as possible over their learning process. Self-efficacy refers to how individuals see events that affect their lives. Those with a strong sense of self-efficacy see themselves as having control over events impacting their lives and often have a high level of confidence that they can manage a distance learning

experience. Intrinsic motivation is learning for the joy of learning. Extrinsic motivation, on the other hand, is motivation toward attaining personal goals such as high grades or course completion and graduation. Intrinsic motivation relates to learning for the sake of increasing knowledge, whereas a person with extrinsic motivation sees learning more as a means to an end, something that has to be undertaken in order to move to the next level in career or life. Ideally, distance learning should be designed to appeal to those with an internal locus of control, to improve learners' self-efficacy, and to enhance intrinsic motivation.

Next the qualities of adult learners were reviewed, in recognition of the fact most distance learners are adults, and understanding that the characteristics of the adult learner is an important consideration for the instructional design of distance learning materials. Adult learners, unlike their younger counterparts, generally bring a wealth of experience and life knowledge to the learning experience that can be of benefit of all learners. As well, adult learners often have opportunities to apply their new knowledge and learning soon after the learning experience, a point that can be advantageous to improving learner motivation.

The chapter concluded with an examination of several attributes of instructional design considered important for improving learner motivation. This examination was necessary to inform the methodology used in this research to study the linkage between learner motivation and instructional design techniques that cater to learner motivation.

CHAPTER III

METHODOLOGY

Introduction

This section begins with a description of the research design and then provides a description of the subjects involved in the study. Next it examines the instrumentation, procedures, and data analysis methods used to conduct the study. The section concludes with a description of the research variables and instructional design methods applied to each of Keller's ARCS elements.

Research Design

A quasi-experimental research design was used to investigate the variables identified in the following exploratory research questions:

1. Does the type of instructional design methodology used in course development affect learner motivation?
2. To what degree, if any, does varying the instructional design methodology affect locus of control, intrinsic and extrinsic motivation, and self-efficacy?

Because a comparison or control group was not used for this research, the wording of the research questions has been specifically chosen so as not to infer that instructional design actually affects motivation, but rather that instructional design can have a positive influence on learner motivation.

The method used to gather data for this research was based on the One-Group Pretest and Posttest design (Creswell, 2003). Two questionnaires were used to measure

the level of student motivation before and after completion of instruction that had been revised using instructional design methodologies consistent with Keller's ARCS model.

Keller's ARCS model addresses each of the motivational characteristics identified as dependent variables in the second research question. Keller determined that changes in locus of control and self-efficacy were addressed in the Confidence element of the model, while intrinsic and extrinsic motivations were affected by Satisfaction and to a lesser extent, by Relevance. Consequently, the research design should discern changes in these motivational characteristics for students before and after the revised lessons. Determining the difference between intrinsic or extrinsic motivation was not attempted during this study. Because external rewards are normally associated with extrinsic motivation and none were provided in this study, increases in Satisfaction and Relevance should reflect a greater effect on intrinsic than extrinsic motivation.

Subjects

The study was conducted using a convenience sample of 204 students enrolled over two semesters (January to July 2006) of the Defence Management course offered by the Royal Military College of Canada, Kingston, Ontario. The sample is comprised of Canadian Forces personnel, both officers and Non-Commissioned Members. Officers are mandated to take the course as part of their ongoing professional development; whereas, Non-Commissioned Members take the course voluntarily.

Instrumentation

Two versions of a questionnaire were constructed (Appendix B and C).

Questionnaire #1 was used to collect data on student motivation following completion of the Defence Management course's first module delivered in its original format, prior to engaging in the revised lessons; while questionnaire #2 was used to collect data on student motivation following completion of two lessons in the second module that had been altered using instructional design practices taken from Keller's ARCS model and other authors identified in Chapter 2 of this thesis. An attempt was made with questionnaire #2 to create a control group; however, only seven students opted for the original version of module 2: a sample that was too small to provide a statistically meaningful comparison.

Both questionnaires contained an introductory section addressing student demographics followed by a second section containing 36 questions that used a Likert-type scale to measure learner motivation. Ten of the 36 questions were negatively worded to increase the strength of the questionnaire. The questionnaire format was developed by Keller (1993) as the Instructional Materials Motivation Survey (IMMS) and was used with permission for this thesis (J. Keller, Personal communication, November 23, 2005). The questions in each questionnaire were altered only to the extent needed to fit the lesson structure used in this research. The questions in the second section of both questionnaires were identical.

Keller (1993) also developed an IMMS manual (Appendix D) that separates the 36 questions into the four related ARCS elements as a means of measuring learner motivation associated with that element. Keller (1993) reported the reliability of the questionnaire based on a Cronbach's alpha measure for each ARCS element and the total

questionnaire. The results of this measure are reported by Keller in the IMMS manual at Appendix D and are reproduced in Table 2.

Table 2- Keller's (1993) Questionnaire Reliability Measure

Element	Cronbach's Alpha Measure
Attention	.89
Relevance	.81
Confidence	.90
Satisfaction	.92
Total Scale	.96

Procedure

Two lessons of the second module of the Defence Management course were redesigned in digital format to incorporate motivational elements described by Keller and the various authors in Chapter 2 of this thesis. Microsoft Word was chosen as the delivery medium for the revised lessons because every Canadian Forces member has access to this software and most are familiar with its operation. Also, Microsoft Word offered all the technological attributes needed for this research.

Students in the Defence Management course were e-mailed the Letter of Introduction (Appendix A), the revised lessons in Microsoft Word format, and the two questionnaires. They were requested to submit questionnaire #1 following completion of Module 1 of the course, before beginning the revised lessons, and to submit the second questionnaire following completion of the revised lessons. Responses to both questionnaires were sent by the students to Athabasca University where they were stripped of identifying information to ensure privacy and confidentiality before being forwarded to the researcher.

The demographic data and responses to each of the 36 questions contained in each questionnaire were entered into an Excel spreadsheet. Each questionnaire was then scored according to the scoring procedure detailed by Keller (1993) in Appendix D (some questions were reverse scored) to compute totals for each of the ARCS components and the total score for the individual questionnaires. For example, each question had five possible responses. If the respondent selected a (2) for a particular question, the question received a score of two. If the question was reversed scored, the (2) would receive a score of four and a (4) would receive a score of two. All question scores representing Attention for individual questionnaires were added together and divided by 12, which is the number of questions associated with Attention in each questionnaire to arrive at an average Attention score for that questionnaire. This process was repeated for the other ARCS components and for the questionnaire total. The result was a list of individual questionnaire scores for each ARCS motivational element and total scores for questionnaires #1 and #2.

Data Analysis

The research questions for this study generated four dependent variables. In the first research question changes to the dependent variable -motivation - was calculated from a Paired Sample T-test conducted on the total scores for questionnaire #1 to those of questionnaire #2. The change in the means of the total scores obtained in the two questionnaires is considered to have been influenced by changes to the independent variable, the instructional design methodology. In the second research question, the dependent variables are the motivational factors of locus of control, intrinsic and extrinsic motivation, and self-efficacy. As previously mentioned, each of these factors is

associated with one or more of Keller's ARCS elements. The change in each of these factors was measured by conducting a Non-Parametric, Two Related Samples, Wilcoxon statistical test on each of the ARCS elements represented in the two questionnaires. This statistical test yields the number of sample pairs from questionnaire #2 that were less than, equal to, and greater than samples gathered from questionnaire #1. If the number of paired samples in which questionnaire #2 ARCS components exceed questionnaire #1 ARCS components is greater than those equal to and less than those of questionnaire #1, an inference can be made that changes in the independent variable, the instructional design methodology, has influenced the dependant variables of locus of control, self-efficacy, and intrinsic/extrinsic motivation.

Revision Strategy

This section will describe the instructional design methodologies used to revise the two lessons of the Defense Management course, based on the four elements of Keller's ARCS model.

Attention

Attention is the first element of Keller's ARCS model and the element that sets the motivational tone for the remainder of the instruction. In a classroom setting, attention can be achieved by the instructor through the use of jokes, anecdotal comment, or a startling action such as slamming a book. The distance-learning designer must rely on the media used to deliver learning to gain and maintain learner attention.

In the revised lessons, attention was first addressed through the inclusion of a module introduction intended to orient the learner and explain the learning format being

used Attention was addressed through the liberal use of headings intended to draw learner interest to each of the sections and sub-sections associated with the individual learning objectives. Pictures were also placed amongst the text to add color and increase learner interest. The pictures chosen related to the content of the lesson by showing military and civilian personnel engaged in the activities described in the lesson content where applicable. Text boxes were also situated in the content to provide anecdotal comments that related to content. These comment boxes described events or humorous incidents to which the learner population could relate.

The language used in the lesson attempted to give the impression the instructor was talking directly to the learner by using the first person "I" and "you," rather than the typical third person structure found in the unrevised module of the course. Also, if there was content in the lesson the instructor assumed the learner would likely find unfamiliar and perhaps confusing, a text box was inserted that provided a relational explanation of the content based on the knowledge or experience the learner likely already possessed.

Text boxes containing self-assessment and open-ended questions about the content were also interspersed throughout the lesson. Some of these questions were taken from previous exams applied to this course and therefore gave the learners an appreciation of what they could expect on the exam. Some of the questions were directed at the potential experience of the learners in an effort to situate the content relative to the learner's own experiences.

Highlight boxes were placed in the left margin within each section of the revised lessons in order to draw the learner's attention to important points in the section, to raise curiosity by providing an unusual pattern to the page, and to facilitate the finding of

certain points during a review of the lesson content. These highlights were in the form of a one or two word title, provided in blue type, along with a one-sentence explanation or definition of the highlighted term.

Relevance

Learning is more meaningful if it can articulate some direct application to the learner's present or future endeavors. Illustrating relevance to the learner helps maintain attention and increases interest in what is being learned. Relevance can also be enhanced by offering learners a measure of control over the learning process.

Relevance in the revised lessons was achieved by using text boxes that illustrated practical applications of the theoretical structures and processes being described in the lesson content. These practical applications were described in a manner considered pertinent to the learner's actual work environment and potential work experiences. Learners were also asked to e-mail their instructor a description of their experience with a particular activity covered in the lesson if they wished. The idea of providing these e-mail experiences was to give the learner an opportunity to create their own relevant connection and to provide the instructor with more examples of relevant occurrences and experiences.

Learner control was offered by giving learners a choice of assessment questions to answer at the end of the lesson. Sufficient questions were provided to ensure each learning objective was adequately addressed. The fact the learners had a choice from a selection of questions meant that they were, in a fashion, controlling their assessment activity.

Confidence

Providing learners with a sense of control over the learning activities enhances an internal locus of control and self-efficacy, and as a result builds learner confidence. The strategies used in the revised lessons included the provision of a linked table of contents that allowed the learner to navigate the lesson content more freely and thereby exercise an element of control over the learning sequence. As well, establishing clear and well structured learning objectives at the beginning of each lesson oriented the learner to the tasks ahead and served to establish learner confidence that the tasks were within the learner's capacity to accomplish.

In the revised lessons, learning objectives were not only listed at the beginning of the lesson, they were used as section breaks to highlight the chunking of material into discrete packages of learning. This format raised the visibility of the individual learning objectives and gave the learner a clearer appreciation of the relationship between the objective and the supporting content. The end result was intended to raise learner confidence by clearly identifying the packages of instruction the student was responsible for learning.

Comparative organizers were also constructed to show the relationship between unfamiliar material and familiar experiences. Examples that were deemed familiar to the learner population were used liberally throughout the lesson content to bring theoretical frameworks to life. The use of text boxes with suitable titles such as "*What does this Mean??*" served to highlight these examples.

Feedback is also considered a confidence-building tool, particularly when it is constructive and highlights not only areas for improvement, but also learner strengths. By

situating the assessment questions at the end of each lesson, confidence was enhanced because the learners were able to complete their assessment while the learning was fresh in their minds. The proximity of the assessment to the actual learning helped reinforce the learning and increased the likelihood of students answering the questions in the assessment correctly.

Satisfaction

Satisfaction is characterized by Gagné and Driscoll (1988) as the easiest element of the ARCS model to satisfy and is most often accomplished by providing timely and constructive feedback. The operative word is *constructive* feedback that not only instructs on how to improve performance on future assignments, but also encourages the learner to continue working hard and highlights achievements that have been made.

The material for the revised lessons was assessed using multiple-choice and short-answer questions. Therefore, opportunities to provide constructive critique were somewhat limited as answers were generally either right or wrong. Still, when an error was encountered, encouragement was provided and the student was directed to the content containing the proper response. In addition, short comments such as "great work" were used to help increase learner confidence and satisfaction.

Distance learning instructors also improve learner satisfaction by staying in regular contact. Distance learning can be a lonely experience, particularly if the learner rarely hears from the instructor. Weekly communication in the form of broadcast e-mail messages, highlighting what has to be accomplished in the week ahead can greatly improve learner satisfaction. In this study, the researcher had limited contact with the learners during the first module of the course amounting to a brief introduction at the

beginning of the module. During delivery of the subsequent revised lessons, however, the researcher made a concerted effort to communicate with the learners weekly or more frequently. The intent of this communication was to determine if learners felt more appreciated and by extension more satisfied because the instructor contacted them regularly.

Another technique used to promote learner satisfaction was the provision of a summary at the end of each lesson. The summaries used for the revised lessons included key words linked to their associated full description in the lesson content. Answers to self-assessment questions were also included at the end of the summary to help learners determine whether or not they had sufficiently comprehended the content of the lesson before undertaking the lesson's post-test assessment.

Summary

This section provided a description of the methodology used for conduct the research effort for this thesis. The learning instrument selected to test the research questions was taken from a distance learning course offered by the Royal Military College of Canada entitled Defense Management. The course includes two modules, of which two lessons in the second module were revised to reflect instructional design techniques intended to enhance learner motivation. Two questionnaires, originally designed by Keller (1993), were administered in the course of this research. Learners were asked to submit the first questionnaire after completing the first module, but prior to beginning the revised lessons in Module 2. They were asked to complete and submit the second questionnaire after having completed the revised lessons. The remainder needs to be revised.

The results generated by the questionnaires were recorded in an Excel spreadsheet. Each questionnaire was scored according to the process detailed by Keller (1983) in the IMMS manual at Appendix D to arrive a total score for each of the ARCS elements. To assess the first research question, a Paired Sample T-Test was conducted on the average totals generated by each questionnaire for questionnaires #1 and #2 to assess the influence of instructional design on learner motivation. To assess the second research question, a Non-Parametric, Two Related Samples, Wilcoxon statistical test was conducted on each of the ARCS components to determine if a change in the instructional design methodology had influenced motivational factors of locus of control, self-efficacy, and intrinsic/extrinsic motivation.

The chapter concludes with a description of the instructional designs techniques employed in the revised lessons intended to improve learner motivation. These techniques are associated with each element of the ARCS model.

CHAPTER IV

RESULTS

Introduction

This chapter reports the results of this research. The chapter begins by reviewing the purpose of the study and the research questions under consideration. It then looks at the demographics of the population accessed in the course of gather data for the research. Although there was no attempt to draw conclusions from the population demographics, this information is useful in understanding those that contributed to the research data.

Significant differences between the means for total scores between the two questionnaires are demonstrated using a Paired Sample T-Test. The analysis of the ARCS elements was conducted using a Non-Parametric, Two Related Samples, Wilcoxon statistical test. Finally, an analysis of the independent motivational components of locus of control, self-efficacy, and intrinsic and extrinsic motivation are provided from their relationship with the ARCS elements.

Purpose of the Study

The purpose of this study was to investigate the potential for influencing learner motivation as a result of enhancements made to the instructional design of selected course materials. The following research questions were explored in the course of this study:

1. Does the type of instructional design methodology used in course development affect learner motivation?
2. To what degree, if any, does varying the instructional design methodology affect locus of control, intrinsic and extrinsic motivation, and self-efficacy?

Instruments

Two questionnaires were used to gather research data. Questionnaire #1 was designed to measure learner motivation following completion of the first Defence Management course module and prior to beginning the revised lessons. This first module was presented in its original format. Questionnaire #2 was designed to be answered following completion of the two revised lessons in module two of the Defence Management course. These two revised lessons incorporated instructional design improvements taken from Keller's ARCS model. The questions related to the instructional content asked in questionnaire #2 were identical to those asked in questionnaire #1 in order to ensure a comparative analysis. The demographic questions were slightly different to determine certain characteristics of how the respondents used the revised learning content.

Subjects

The subjects for this research were students taking a distance learning Defence Management course from the Royal Military College, Kingston, Ontario. The original intent was to approach only learners participating in the 2006 winter term offering of the Defence Management course for this research, but returns for questionnaire #2 were very low (seven) requiring that the 2006 summer offering of the course also be used to generate data for this research. The combined learner sample was 204 and was treated as a homogeneous group of learners even though they came for two separate offerings of the course. The approach used to administer the course and the research documents distributed to the learners were consistent across both course offerings.

The demographics recorded from the two questionnaires are included in Table 3.

Table 3– Questionnaire Demographics

Question	Questionnaire #1	Questionnaire #2
Total Potential Participants	204	204
Total Responses	48	26
Response Rate	23.5%	12.3%
First DL Course	Yes = 25 No = 17	Yes = 16 No = 10
Officers	21	8
NCMs	27	18
Female	18	11
Male	30	15
Comfort Level with Computers VC = Very Comfortable C = Comfortable U = Uncomfortable VU = Very Uncomfortable	VC - 28 C - 18 U - 1 VU - 1	VC - 13 C - 12 U - 1 VU - 0
Use a Computer to Read the Revised Lessons		10
Percentage or Time Connected to the Internet		100% - 10 70% - 1 30% - 3 0% - 12

It is interesting that while 48 learners responded to questionnaire #1 for a 23.5% response rate, only 26 learners responded to questionnaire #2 for a 12.7% response rate. Over 50% of the respondents to both questionnaires were taking a distance learning course for the first time highlighting the importance of making the distance learning experience positive and memorable. Non-Commissioned Members and Males accounted for the majority of respondents indicative of the course and Canadian Forces demographic.

Both questionnaires asked respondents to indicate their level of comfort with computers for the purpose of determining the ability of learners to use computers for distance learning without the benefit of additional training. For questionnaire #1, 46 or 94% of respondents indicated being either comfortable or very comfortable with

computer usage: for questionnaire #2, 25 or 96% indicated being either comfortable or very comfortable with computer usage. In questionnaire #2, 10 respondents indicated they used their computer to study the revised lessons. These same 10 respondents were connected to the Internet 100% of their study time, while of those who printed the revised lessons; one spent 70% of the study time on the Internet, three 30% of the study time on the Internet, and 12 did not use the online functionality built into the revised lessons.

Descriptive Statistics

Due to the unequal number of returns from questionnaire #1 (48) and questionnaire #2 (26), it was necessary to equalize the number of responses in each group. Therefore, questionnaire #1 data was reduced to 26 by matching responses based on an analysis of the sex, rank, and comfort level with the use of computers in order to arrive at comparative samples from both questionnaires. Descriptive statistics were generated on each of the ARCS components and the questionnaire totals for each questionnaire as reported in Table 4 that follows.

Table 4 – Descriptive Statistics

	Questionnaire #1	Questionnaire #2
Attention		
Mean	2.9804	3.8527
N	26	26
Std Deviation	.81330	.58391
Std Error Mean	.15950	.11451
Relevance		
Mean	3.5896	3.8754
N	26	26
Std Deviation	.65131	.58901
Std Error Mean	.12773	.11552
Confidence		
Mean	3.1750	3.9315
N	26	26
Std Deviation	.65721	.53521
Std Error Mean	.12889	.10496
Satisfaction		
Mean	3.0958	3.5642
N	26	26
Std Deviation	.74621	.59553
Std Error Mean	.14634	.11699
Total		
Mean	3.2019	3.8296
N	26	26
Std Deviation	.64016	.51437
Std Error Mean	.12554	.10088

Research Question #1

This research question sought to determine if motivation was influenced as a result of changes to the instructional design of a learning product. To measure the dependant variable, motivation, a Paired Sample T-Test was conducted on the total means computed from each questionnaire for questionnaires #1 and #2. The results of this test are shown in Table 5.

Table 5 – Paired Sample T-Test of Total Means between Questionnaire #1 and #2

Paired Samples Statistics	Q1Total	Q2Total
Mean	3.2019	3.8296
Standard Deviation	.64016	.51437
Std. Error Mean	.12554	.10088
n	26	26
Paired Samples Test	Q1 and Q2 Total	
Mean	-.6277	
Standard Deviation	.86976	
t	-3.680	
df	25	
Sig. (2-tailed)	.001	

The t value difference for the Paired Sample T-Test of the total means derived from questionnaires #1 and #2 is -3.680 at .001 significance level indicating a significant difference in the two values (as one option). The mean for questionnaire #1 was 3.2019 and for questionnaire #2 was 3.8296 indicating a positive shift in the mean. There is strong evidence from this analysis that the change in instructional design for the two lessons in module two had a positive influence on learner motivation.

Research Question #2

This research question sought to determine if locus of control, self-efficacy, and intrinsic and extrinsic motivation were affected as a result of changes to the instructional design of a learning product. To measure these dependant variables, a Non-Parametric, Two Related Samples, Wilcoxon statistical test was conducted on the scores for each ARCS elements computed from each questionnaire for questionnaires #1 and #2 recognizing that the dependent variables are directly related to the ARCS elements.

Attention Element

Table 6 shows the Non-Parametric, Two Related Samples, Wilcoxon statistical test for the Attention elements.

Table 6 – Non-Parametric Two Related Samples Wilcoxon Statistical Test of Attention Elements for Questionnaire #1 and #2

Q2 ATTN – Q1 ATTN	N	Mean Rank	Sum of Ranks
Negative Ranks	5a	6.40	32.00
Positive Rank	19b	14.11	268
Ties	2c		
Total	26		
Legend	Test Statistics		
a - Q2 ATTN < Q1 ATTN		Q2 ATTN – Q1 ATTN	
b - Q2 ATTN > Q1 ATTN	Z	-3.372a	
c - Q1 ATTN = Q2 ATTN	Asymp. Sig. (2-tailed)	.001	

The number of occurrences in which the Attention value of Questionnaire #2 exceeds that of Questionnaire #1 is 19; indicating 19 of 26 respondents scored the Attention value higher for the revised lessons. The results indicate that there is a statistically significant difference between Questionnaire #1 Attention and Questionnaire #2 Attention ($z = -3.372a$, $p = 0.001$). Because the z-score is negative, the sum of the ranks of the group on the left of the equal sign (Q1 ATTN) must be smaller than the sum of the ranks of the group on the right. There is strong evidence from this analysis that the change in instructional design for the two lessons in module two likely had a positive influence on the Attention element of the ARCS model.

Relevance Element

Table 7 shows the Non-Parametric, Two Related Samples, Wilcoxon statistical test for the Relevance elements.

Table 7 – Non-Parametric Two Related Samples Wilcoxon Statistical Test of Relevance Elements for Questionnaire #1 and #2

Q2 REL – Q1 REL	N	Mean Rank	Sum of Ranks
Negative Ranks	10a	10.95	109.50
Positive Rank	15b	14.37	215.50
Ties	1c		
Total	26		

Legend	Test Statistics	
a - Q2 REL < Q1 REL		Q2 REL – Q1 REL
b - Q2 REL > Q1 REL	Z	-1.427a
c - Q1 REL = Q2 REL	Asymp. Sig. (2-tailed)	.154

The number of occurrences in which the Relevance value of Questionnaire #2 exceeds that of Questionnaire #1 is 15; indicating 15 of 26 respondents scored the Relevance value higher for the revised lessons. The results indicate that there is a difference between Questionnaire #1 Relevance and Questionnaire #2 Relevance ($z = -1.427a$, $p = 0.154$). Because the z-score is negative, the sum of the ranks of the group on the left of the equal sign (Q1 REL) must be smaller than the sum of the ranks of the group on the right; however, the difference is not significant at the 95% level of confidence. There is evidence from this analysis that the change in instructional design for the two lessons in module two likely had a positive influence on the Relevance element of the ARCS model.

Confidence Element

Table 8 shows the Non-Parametric, Two Related Samples, Wilcoxon statistical test for the Confidence elements.

Table 8 – Non-Parametric Two Related Samples Wilcoxon Statistical Test of Confidence Elements for Questionnaire #1 and #2

Q2 CONF – Q1 CONF	N	Mean Rank	Sum of Ranks
Negative Ranks	3a	12.17	36.50
Positive Rank	23b	13.67	314.50
Ties	0c		
Total	26		

Legend	Test Statistics	
a - Q2 CONF < Q1 CONF		Q2 CONF – Q1 CONF
b - Q2 CONF > Q1 CONF	Z	-3.532a
c - Q1 CONF = Q2 CONF	Asymp. Sig. (2-tailed)	.000

The number of occurrences in which the Confidence value of Questionnaire #2 exceeds that of Questionnaire #1 is 23; indicating 23 of 26 respondents scored the Confidence value higher for the revised lessons. The results indicate that there is a statistically significant difference between Questionnaire #1 Confidence and Questionnaire #2 Confidence ($z = -3.532a$, $p = 0.000$). Because the z-score is negative, the sum of the ranks of the group on the left of the equal sign (Q1 CONF) must be smaller than the sum of the ranks of the group on the right. There is strong evidence from this analysis that the change in instructional design for the two lessons in module two likely had a positive influence on the Confidence element of the ARCS model.

Satisfaction Element

Table 9 shows the Non-Parametric, Two Related Samples, Wilcoxon statistical test for the Satisfaction elements.

Table 9 – Non-Parametric Two Related Samples Wilcoxon Statistical Test of Satisfaction Elements for Questionnaire #1 and #2

Q2 SAT – Q1 SAT	N	Mean Rank	Sum of Ranks
Negative Ranks	9a	8.56	77.00
Positive Rank	15b	14.87	223.00
Ties	2c		
Total	26		
Legend	Test Statistics		
a - Q2 SAT < Q1 SAT		Q2 SAT – Q1 SAT	
b - Q2 SAT > Q1 SAT	Z	-2.087a	
c - Q1 SAT = Q2 SAT	Asymp. Sig. (2-tailed)	.037	

The number of occurrences in which the Satisfaction value of Questionnaire #2 exceeds that of Questionnaire #1 is 15; indicating that 15 of 26 respondents scored the Satisfaction value higher for the revised lessons. The results indicate that there is a statistically significant difference between Questionnaire #1 Satisfaction and Questionnaire #2 Satisfaction ($z = -2.087a$, $p = 0.037$). Because the z-score is negative, the sum of the ranks of the group on the left of the equal sign (Q1 SAT) must be smaller than the sum of the ranks of the group on the right. There is strong evidence from this analysis that the change in instructional design for the two lessons in module two likely had a positive influence on the Satisfaction element of the ARCS model.

Effect on Locus of Control, Self-Efficacy, Intrinsic/Extrinsic Motivation

Keller noted that Locus of Control and Self-Efficacy are reflected in the “Confidence” element of the ARCS model while Intrinsic and Extrinsic Motivation fall primarily within the Satisfaction element (personal communication, November 23, 2005). Although it is unlikely that these motivational elements are affected exclusively by these parts of the ARCS model, the relationship to instructional design activities associated

with these parts of the model lend themselves most directly to affecting these motivational elements. Because all parts of the ARCS model increased with the instructional design enhancements (although the increase in the Relevance element was not statistically significant), it is concluded that the motivational elements of locus of control, self-efficacy, and intrinsic/extrinsic motivation also improved to the degree of their associated ARCS component.

It is difficult to draw a distinction between intrinsic and extrinsic motivation in a learning situation such as that explored by this research. It would seem reasonable that non-commissioned officers would be more intrinsically motivated than officers since they engage in the Defence Management course voluntarily rather than as a necessary part of their mandated professional development as is the case with officers. However, it was not the purpose of this research to draw a distinction between intrinsic and extrinsic motivation. Consequently, it can only be determined from the results of this study that these motivational elements did improve as reflected in the increase to the Satisfaction component of the ARCS model.

Summary

This chapter provided the results of this research. The chapter began by reviewing the purpose of the study and the research questions under consideration. It then provided a synopsis of the demographic information gathered in the course of the research. The provision of demographic information was for the purpose of informing the reader of the study population but was not examined in any detail in order to draw conclusions about the population.

A significant difference between the means for the total scores between the two questionnaires was demonstrated using a Paired Sample T-Test. The analysis of the ARCS elements was conducted using a Non-Parametric, Two Related Samples, Wilcoxon statistical test. Finally, an analysis of the dependent motivational components of locus of control, self-efficacy, and intrinsic and extrinsic motivation are provided and discussed in terms of their relationship with the ARCS elements.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

Introduction

The purpose of this study was to explore various instructional design strategies and methodologies in order to determine their impact on learner motivation. The intent of the study was to examine certain instructional design elements considered to have a positive impact on learner motivation and that would, therefore, likely enhance learner motivation in a distance learning course.

Studies, such as that conducted by Keller and Burkman (1993), attribute learner motivation to the role instructional designers and instructors play in the design, development, and delivery of instructional materials. Consequently, the instructional design process can have a significant impact on how well learners will do in their learning endeavors and their persistence to remain in an educational program. For this reason, it is very important that distance educators, administrators and those designing distance-learning products appreciate the impact of motivation on the persistence of their distance learners (Abdul-Rahman, 1994).

In the late 1970s, John Keller commenced work on learner motivation that eventually resulted in the development of an instructional design model referred to as ARCS. ARCS is an acronym for Attention, Relevance, Confidence, and Satisfaction (Smith & Ragan, 1999). Gagné and Driscoll (1988) provide the following definition of the four ARCS terms:

Attention: Arousing and sustaining learner curiosity and interest.

Relevance: The learner is aware that the learning being undertaken has personal value or importance.

Confidence: Learners must believe that they can accomplish the goal of learning successfully.

Satisfaction. Satisfaction is the feeling accompanying the process of reinforcement (p 71).

Keller developed instructional design strategies to address each of the elements in his ARCS model and while these strategies have been available for several years, there is evidence they have not receive sufficient attention by instructional designers in the broad context of designing distance-learning courseware.

This study took the instructional design methods developed by Keller and others and applied these methods to the redesign of an existing instructional product in order to determine if a measurable improvement in motivation could be determined. To this end, the following research questions formed the subject of this study: [make sure they are the same as before]

1. Does the type of instructional design methodology used in course development affect learner motivation?
2. To what degree, if any, does varying the instructional design methodology affect locus of control, intrinsic and extrinsic motivation, and self-efficacy?

Theory of Instructional Design

Keller (1983) noted that most adult learners are already motivated to learn by virtue of the fact they self-select to engage in their studies and that, in some cases, they

made a conscious commitment to undertake their studies by distance learning. However, each student entering a program of study will have experienced different life events, different social settings, different educational experiences, and will have different goals. These experiences will affect their motivation elements of locus of control, self-efficacy, and intrinsic and extrinsic motivation.

Some will exhibit an internal locus of control suggesting they regard events affecting their lives to be within their control to manipulate. Those learners exhibiting an external locus of control, on the other hand, perceive that events affecting their lives are beyond their control to influence (Keller, 1983; Gagné & Medsker, 1996). Miltiadou and Savenye (2003), citing Bandura (1986), describe self-efficacy as an "individuals' confidence in their ability to control their thoughts, feelings, and actions, and therefore influence an outcome" (p. 6). However, the cultivation of a strong sense of self-efficacy begins at a very early age and relies on numerous life experiences for development. Consequently, it is difficult for any individual instructor or instructional designer to significantly alter an already well developed sense of efficacy, particularly if past academic performance has not been generally positive. Intrinsic motivation stems from an inner sense of accomplishment that leads one to undertake activities often for the sheer joy of learning or doing. People exhibiting intrinsic motivation do not necessarily need an exterior motive for their actions. Extrinsic motivation, on the other hand, is derived from external motivators such as prizes for good performance or the need to take a course to achieve a credit toward program completion whether or not the course is of interest to the learner. These various motivational elements are imbedded in the ARCS components and can be addressed by instructional designers or instructors by incorporating

instructional techniques that support the ARCS components into the design of their courses or learning products. This study examined the impact of instructional design on each of these motivational elements by conducting a comparative analysis of the four ARCS components before and after an instructional design intervention had been affected.

Review of Research Results

A quasi-experimental research design, a One Group Pretest and Posttest design, was used to investigate the variables identified in this study (Creswell, 2003). Two questionnaires were used to measure the level of student motivation before and after completion of instruction that had been revised using instructional design methodologies consistent with Keller's ARCS model.

Differences between the means for the total scores between the two questionnaires were demonstrated using a Paired Sample T-Test. The analysis of the ARCS elements was conducted using a Non-Parametric, Two Related Samples, Wilcoxon statistical test. Finally, an analysis of the independent motivational components of locus of control, self-efficacy, and intrinsic and extrinsic motivation were provided by examining their relationship to their associated ARCS element.

The results of this study showed that there was a discernable improvement in learner motivation associated with each ARCS element between those lessons that had been altered using instructional techniques designed to improve learner motivation and those that had not been altered. The implication of this result is that attention to motivation by instructional designers and others involved in the production of learning

products will have a positive effect on learner motivation. Furthermore, because the techniques used to alter the lessons in module two of the Defense Management Course were drawn from those instructional design techniques described in Chapter 2 of this thesis, it can be concluded that using a combination of these techniques and practices will have a positive effect on learner motivation.

The study was somewhat limited by the low response rate (48 responses for Questionnaire #1 and 26 for Questionnaire #2). Certainly a larger sample size or a higher response rate, particularly with the second questionnaire, would have strengthened the overall study. Still, the results derived from analysis of the data did show, with the exception of the Relevance factor, that the ARCS factors had a significantly positive effect on learner motivation.

Recommendations and Implications for Instructional Designers

The study shows that instructional designers and instructors can have a positive impact on the motivation of distance learners by incorporating techniques in their designs that relate to the four ARCS components, i.e., that addresses learner attention, ensures the relevance of the learning to be undertaken, builds learner confidence in the learning process, and satisfies the learner's need for self actualization. They need to be cognizant of these motivational elements during the design phase of the ISD process and take efforts to ensure each element is addressed sufficiently and with enough variety that learner motivation is sustained throughout the learning experience.

The study utilized a number of instructional design techniques to motivate learners; however, there are still many more. Instructors and instructional designers are

encouraged to use their imagination and constantly be on the look out for other techniques that will enhance the motivational capacity of their learning products or courses.

Technology, while not a panacea for enhancing learner motivation, does offer greater flexibility today than in earlier distance learning offerings. As well, learners are becoming increasingly more sophisticated in their appreciation of technology and better able to accommodate the latest technological developments. Instructors and instructional designers can also increase their understanding of what motivates learners by having students evaluate their learning products or courses specifically for motivational elements. Even small informal evaluations can highlight those motivational techniques that work and those that fall short of the desired results.

The following sub-sections describe the instructional design techniques used to redesign the lessons for this study. The study results showed an improvement in learner motivation for each of the ARCS elements as a result of using these techniques.

Attention

In the revised lessons, attention was addressed through the inclusion of a module introduction intended to orient the learner and explain the learning format being used. Attention was also addressed through the liberal use of headings intended to draw learners' attention to each of the sections and sub-sections associated with the individual learning objectives. Pictures were placed amongst the text to add color and increase learner interest. The pictures chosen related to the content of the lesson by showing military and civilian personnel engaged in the activities described in the lesson content where applicable. Text boxes were also situated in the content to provide anecdotal

comments that related to content. These comment boxes described events or humorous incidents to which the learner population could relate.

The language used in the lesson attempted to give the impression the instructor was talking directly to the learner by using the first person "I" and "you," rather than the typical third-person language found in the unrevised module of the course. Also, if there was content in the lesson the instructor assumed the learner would likely find unfamiliar and perhaps confusing, a text box was inserted that provided a relational explanation of the content based on the knowledge or experience the learner likely already possessed.

Text boxes containing self-assessment and open-ended questions about the content were also interspersed throughout the lesson. Some of these questions were taken from previous exams used in the course and therefore gave the learners an appreciation of what they could expect on the exam. Some of the questions were directed at the potential experience of the learners in an effort to situate the content relative to the learner's own experiences.

Highlight boxes were placed in the left margin within each section of the revised lessons in order to draw the learner's attention to important points in the section, to raise curiosity by providing an unusual pattern to the page, and to facilitate the finding of certain points during a review of the lesson content. These highlights were in the form of a one- or two-word title, provided in blue type, along with a one-sentence explanation or definition of the highlighted term.

Relevance

Relevance in the revised lessons was addressed by including text boxes that illustrated practical applications of the theoretical structures and processes being described in the lesson content. These practical applications were described in a manner considered pertinent to the learner's actual work environment and potential work experiences. Learners were also asked to e-mail their instructor a description of their experience with a particular activity covered in the lesson if they wished. The idea of providing these e-mail experiences was to give learners an opportunity to create their own relevant connection and to provide the instructor with more examples of relevant occurrences and experiences.

Learner control was offered by giving learners a choice of assessment questions to answer at the end of the lesson. Sufficient questions were provided to ensure each learning objective was adequately addressed. The fact the learners had a choice from a selection of questions meant that they were, in a fashion, controlling their assessment activity.

Confidence

In the revised lessons, learning objectives were not only listed at the beginning of the lesson, they were used as section breaks to highlight the chunking of the events into discrete packages of learning. This format raised the visibility of the individual learning objectives and gave learners a clearer appreciation of the relationship between the objective and the supporting content. The end result was intended to raise learner

confidence by clearly identifying the parts of instruction the student was responsible for learning.

Comparative organizers were also constructed to show the relationship between unfamiliar material and familiar experiences. Examples that were deemed familiar to the learner population were used liberally throughout the lesson content to bring theoretical frameworks to life. The use of text boxes with suitable titles such as "*What does this Mean??*" served to highlight these examples.

Feedback is considered a confidence-building tool, particularly when it is constructive and highlights not only areas for improvement, but also learner strengths. By situating the assessment questions at the end of each lesson, confidence was enhanced because the learners were able to complete their assessment while the learning was fresh in their minds. The proximity of the assessment to the actual learning helped reinforce the learning and increased the likelihood of students answering the questions in the assessment correctly.

Satisfaction

The material for the revised lessons was assessed using multiple-choice and short-answer questions. Therefore, opportunities to provide constructive critique were somewhat limited as answers were generally either right or wrong. Still, when an error was encountered, encouragement was provided and the student was directed to the content containing the proper response. In addition, short comments such as "Great work" were used to help increase learner confidence and satisfaction.

Distance learning instructors can also improve learner satisfaction by staying in regular contact. Distance learning can be a lonely experience, particularly if the learner rarely hears from the instructor. Weekly communication in the form of broadcast e-mail messages, highlighting what has to be accomplished in the week ahead can greatly improve learner satisfaction. In this study, the researcher had limited contact with the learners during the first module of the course amounting to a brief introduction at the beginning of the module. During delivery of the subsequent revised lessons, however, the researcher made a concerted effort to communicate with the learners weekly or more frequently. The intent of this communication was to determine if learners felt more appreciated and by extension more satisfied because the instructor contacted them regularly.

Another technique used to promote learner satisfaction was the provision of a summary at the end of each lesson. The summaries used for the revised lessons included key words linked to their associated full description in the lesson content. Answers to self-assessment questions were also included at the end of the summary to help learners determine whether or not they had sufficiently comprehended the content of the lesson before undertaking the lesson's post-test assessment.

Suggestions for Further Research

The revised lessons for this study were delivered using Microsoft Word because of familiarity with this technology on the part of the test subjects. In terms of available distance learning technologies, Microsoft Word is relatively low level. Researchers may

want to explore more advanced technologies and interactive communication methodologies to determine if these further enhance learner motivation.

This study used a Pretest/Posttest quasi-experimental design. Researchers may wish to conduct further studies using a Pretest/Posttest Control Group Design (Creswell, 2003) in which both groups take the same lesson material, however, one group has the revised lessons and one group uses the original lesson format. Alternative designs such as this would provide a stronger study of the impact of various instructional design strategies on learner motivation and contribute to our understanding of this important area.

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Appendix A – Letter of Introduction

**Masters of Distance Education
Athabasca University
Thesis Letter of Introduction
by Dennis Margueratt**

Dear DCE 001 student:

I am enrolled in a Master of Distance Education program at Athabasca University and have selected the thesis route to complete my degree. At present, I am working on the thesis component of my degree and have elected to research a topic dealing with motivation in distance learning.

Accompanying this letter of introduction are two questionnaires that will form the basis of my research into the area of learner motivation. You are being requested to complete each of these questionnaires in support of this research.

My purpose for the research is to examine if learner motivation is enhanced with improved instructional design. To test this theory, I have taken module two of your DCE 001 course and redesigned it using a particular methodology I have been studying.

Your participation in this research is entirely voluntary. The very act of returning a completed questionnaire is taken as an indication of your consent to participate. Your participation or lack of participation will in no way affect your grades on this course. Furthermore, your responses will be kept strictly confidential and will not be shared with anyone else.

On completion of the questionnaire, you are requested to email the questionnaire as an attachment to Ms Glenda Hawryluk at glendah@athabascau.ca. Ms Hawryluk will

remove all information from your submission that could identify you to me and will forward to me your submitted questionnaire.

The following gives the details of the two questionnaires:

1. The first questionnaire should be completed once you have finished Module 1 of DCE 001 and the first assignment. The questionnaire consists of 36 questions and should take about 10 to 15 minutes to complete. Please place a number from the legend at the beginning of the questionnaire in the box immediately preceding each question that best reflects your thoughts about Module 1.
2. The second questionnaire is identical to the first and should be completed only after you have finished Module 2 of DCE 001. Again, the questionnaire consists of 36 questions and should take about 10 to 15 minutes to complete. Please place a number from the legend at the beginning of the questionnaire in the box immediately preceding each question that best reflects your thoughts about Module 2.

The results of this survey will be included in my Thesis, a copy of which will be deposited with the DCS, RMC and available for your perusal, if you so wish. You may also contact me for any details of the research and the results

This project has received approvals from the Research Ethics Board of the Royal Military College and from Athabasca University. If you have any questions regarding the ethics of this project, you may contact Dr. S. Ranganathan, Chair, RMC REB at 613-541-6000 ext 6057 or via e-mail at ranganathan-s@rmc.ca.

The confidentiality of your participation is assured. Your name will never appear in the results of this research. Only the researcher and researcher's supervisor will see your responses. It is anticipated that the results of this research will be published in the summer 2006.

Thank you for your participation in this study.

Dennis Margueratt
Athabasca University
Master of Distance Education Program

Appendix B – Questionnaire #1

Questionnaire #1 (Submitted to Learners near completion of Module 1)

Instructional Design Affect on Motivation

The following questions are adapted from the Instructional Materials Motivation Survey developed by Dr John Keller, Copyright © 1993, John M. Keller. Adapted with permission

Instructions

Please answer each of the questions listed below to the best of your ability by placing number ranging from 1 to 5 in the box that best identifies your response to the question according to the numerical scale offered below. There is no right or wrong answers. It is also requested you complete the demographic questions at the beginning of the questionnaire. These are asked in order to categorize the questionnaire response and will not be used to identify the questionnaire's respondent.

Demographic Information

Please highlight the applicable response.

Is this your first distance-learning course?	Yes	No
Are you an officer or an NCM?	Officer	NCM
Are you a male or female?	Female	Male
Please indicate your comfort level with computers and use of the Internet.	Very Comfortable	Comfortable
	Uncomfortable	Very Uncomfortable

Questions Related to Module One of DCE 001

1. There are 36 statements in this questionnaire. Please think about each statement in relation to the instructional materials you studied in Module One, and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.

2. Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.
3. Please place an "X" to the right of the number that relates to the numbers in the legend below. Thank you.

1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

1. When I first looked at this module, I had the impression that it would be easy for me.
1. 2. 3. 4. 5.
2. There was something interesting at the beginning of each lesson that got my attention.
1. 2. 3. 4. 5.
3. This material was more difficult to understand than I would like for it to be.
1. 2. 3. 4. 5.
4. After reading the introductory information for each lesson, I felt confident that I knew what I was supposed to learn from the lesson.
1. 2. 3. 4. 5.
5. Completing the assignment for this module gave me a satisfying feeling of accomplishment.
1. 2. 3. 4. 5.
6. It is clear to me how the content of this material is related to things I already know.
1. 2. 3. 4. 5.
7. Many of the pages had so much information that it was hard to pick out and remember the important points.

1. 2. 3. 4. 5.

1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

8. These materials are eye-catching.

1. 2. 3. 4. 5.

9. There were stories, pictures, or examples that showed me how this material could be important to some people.

1. 2. 3. 4. 5.

10. Completing this module successfully was important to me.

1. 2. 3. 4. 5.

11. The quality of the writing helped to hold my attention.

1. 2. 3. 4. 5.

12. The lessons are so abstract that it was hard to keep my attention focused on the material.

1. 2. 3. 4. 5.

13. As I worked on this module, I was confident that I could learn the content.

1. 2. 3. 4. 5.

14. I enjoyed this module so much that I would like to know more about this topic.

1. 2. 3. 4. 5.

15. The pages of this module look dry and unappealing.

1. 2. 3. 4. 5.

1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

16. The content of this material is relevant to my interests.

1. 2. 3. 4. 5.

17. The way the information is arranged on the pages helped keep my attention.

1. 2. 3. 4. 5.

18 There are explanations or examples of how people use the knowledge in this module.

1. 2. 3. 4. 5.

19 The assignment in this module was too difficult.

1. 2. 3. 4. 5.

20. This module had things that stimulated my curiosity.

1. 2. 3. 4. 5.

21. I really enjoyed studying this module.

1. 2. 3. 4. 5.

22. The amount of repetition in this module caused me to get bored sometimes.

1. 2. 3. 4. 5.

23. The content and style of writing in this module convey the impression that its content is worth knowing.

1. 2. 3. 4. 5.

24. I learned some things that were surprising or unexpected.

1. 2. 3. 4. 5.

1 = Not true

2 = Slightly true

3 = Moderately true

4 = Mostly true

5 = Very true

25. After working on this module for a while, I was confident that I would be able to pass the final exam.

1. 2. 3. 4. 5.

26. This module was not relevant to my needs because I already knew most of it.

1. 2. 3. 4. 5.

27. The assistance I received during this module helped me feel rewarded for my effort.

1. 2. 3. 4. 5.

28. The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the individual lessons.

1. 2. 3. 4. 5.

29. The style of writing is boring.

1. 2. 3. 4. 5.

30. I could relate the content of this module to things I have seen, done, or thought about in my own life.

1. 2. 3. 4. 5.

31. There are so many words on each page that it is irritating.

1. 2. 3. 4. 5.

32. It felt good to successfully complete this module.

1. 2. 3. 4. 5.

1 = Not true

2 = Slightly true

3 = Moderately true

4 = Mostly true

5 = Very true

33. The content of this module will be useful to me.

1. 2. 3. 4. 5.

34. I could not really understand quite a bit of the material in this module.

1. 2. 3. 4. 5.

35. The good organization of the content helped me be confident that I would learn this material.

1. 2. 3. 4. 5.

36. It was a pleasure to work on such a well-designed module.

1. 2. 3. 4. 5.

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Appendix C – Questionnaire #2

Questionnaire #2 (Submitted to Learners near completion of the first two lessons of Module 2)

Instructional Design Affect on Motivation

The following questions are adapted from the Instructional Materials Motivation Survey developed by Dr John Keller, Copyright © 1993, John M. Keller. Adapted with permission.

Instructions

Please answer each of the questions listed below to the best of your ability by placing number ranging from 1 to 5 in the box that best identifies your response to the question according to the numerical scale offered below. There is no right or wrong answers. It is also requested you complete the demographic questions at the beginning of the questionnaire. These are asked in order to categorize the questionnaire response and will not be used to identify the questionnaire's respondent.

Demographic/User Information

Please place a "X" after the applicable response.

Is this your first distance learning course?	Yes		No	
Are you an officer or an NCM?	Officer		NCM	
Are you a male or female?	Female		Male	
Please indicate your comfort level with computers and use of the Internet.	Very Comfortable		Comfortable	
	Uncomfortable		Very Uncomfortable	
Please indicate which Module 2 you completed.	Original Module Two		Revised Module Two	
If you chose to use the revised Module,	Printed the module		Completed the module using my computer	

how did you complete the Module?				
If you completed a portion of the Module using your computer, how much of the time were you connected to the internet	All the time		70% of the time	
	50% of the time		30% of the time or less	

Questions Related to Module Two of DCE 001

1. There are 36 statements in this questionnaire. Please think about each statement in relation to the instructional materials you studied in Module One, and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.
2. Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements or by the answers you provided in Questionnaire #1.
3. Please place an "X" to the right of the number that relates to the numbers in the legend below. Thank you.

- 1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

1. When I first looked at this module, I had the impression that it would be easy for me.

1. 2. 3. 4. 5.

2. There was something interesting at the beginning of each lesson that got my attention.

1. 2. 3. 4. 5.

3. This material was more difficult to understand than I would like for it to be.

1. 2. 3. 4. 5.

- 1 = Not true
- 2 = Slightly true
- 3 = Moderately true
- 4 = Mostly true
- 5 = Very true

- 4. After reading the introductory information for each lesson, I felt confident that I knew what I was supposed to learn from the lesson.
1. 2. 3. 4. 5.
- 5. Completing the assignment for this module gave me a satisfying feeling of accomplishment.
1. 2. 3. 4. 5.
- 6. It is clear to me how the content of this material is related to things I already know.
1. 2. 3. 4. 5.
- 7. Many of the pages had so much information that it was hard to pick out and remember the important points.
1. 2. 3. 4. 5.
- 8. These materials are eye-catching.
1. 2. 3. 4. 5.
- 9. There were stories, pictures, or examples that showed me how this material could be important to some people.
1. 2. 3. 4. 5.
- 10. Completing this module successfully was important to me.
1. 2. 3. 4. 5.
- 11. The quality of the writing helped to hold my attention.

1. 2. 3. 4. 5.

1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

12. The lessons are so abstract that it was hard to keep my attention focused on the material.

1. 2. 3. 4. 5.

13. As I worked on this module, I was confident that I could learn the content.

1. 2. 3. 4. 5.

14. I enjoyed this module so much that I would like to know more about this topic.

1. 2. 3. 4. 5.

15. The pages of this module look dry and unappealing.

1. 2. 3. 4. 5.

16. The content of this material is relevant to my interests.

1. 2. 3. 4. 5.

17. The way the information is arranged on the pages helped keep my attention.

1. 2. 3. 4. 5.

18 There are explanations or examples of how people use the knowledge in this module.

1. 2. 3. 4. 5.

19 The assignment in this module was too difficult.

1. 2. 3. 4. 5.

1 = Not true

2 = Slightly true

3 = Moderately true

4 = Mostly true

5 = Very true

20. This module had things that stimulated my curiosity.

1. 2. 3. 4. 5.

21. I really enjoyed studying this module.

1. 2. 3. 4. 5.

22. The amount of repetition in this module caused me to get bored sometimes.

1. 2. 3. 4. 5.

23. The content and style of writing in this module convey the impression that its content is worth knowing.

1. 2. 3. 4. 5.

24. I learned some things that were surprising or unexpected.

1. 2. 3. 4. 5.

25. After working on this module for a while, I was confident that I would be able to pass the final exam.

1. 2. 3. 4. 5.

26. This module was not relevant to my needs because I already knew most of it.

1. 2. 3. 4. 5.

27. The assistance I received during this module helped me feel rewarded for my effort.

1. 2. 3. 4. 5.

1 = Not true

2 = Slightly true

3 = Moderately true

4 = Mostly true

5 = Very true

28. The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the individual lessons.

1. 2. 3. 4. 5.

29. The style of writing is boring.

1. 2. 3. 4. 5.

30. I could relate the content of this module to things I have seen, done, or thought about in my own life.

1. 2. 3. 4. 5.

31. There are so many words on each page that it is irritating.

1. 2. 3. 4. 5.

32. It felt good to successfully complete this module.

1. 2. 3. 4. 5.

33. The content of this module will be useful to me.

1. 2. 3. 4. 5.

34. I could not really understand quite a bit of the material in this module.

1. 2. 3. 4. 5.

35. The good organization of the content helped me be confident that I would learn this material.

- 1.
- 2.
- 3.
- 4.
- 5.

36. It was a pleasure to work on such a well-designed module.

- 1.
- 2.
- 3.
- 4.
- 5.

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Appendix D – IMMS Instruction Manual

Manual for the *Instructional Materials Motivation Survey (IMMS)*

John Keller
Florida State University¹

Purpose

The Instructional Materials Motivation Survey is intended to be a situational measure of students' motivational reactions to instructional materials. It was designed in accordance with the theoretical foundation represented by the ARCS Model (Keller, 1987a, 1987b). This theory is derived from the current literature on human motivation; hence, many of the items in the IMMS are similar in intent (but not in wording) to items in established measures of psychological constructs such as need for achievement, locus of control, and self-efficacy, to mention three examples.

Method

After reviewing the concepts and strategies that comprise the ARCS model and a variety of instruments used to measure motivational constructs, a pool of items was prepared.

Results

Reliability estimates based on Cronbach's alpha measure were obtained for each subscale and the total scale. They were:

Attention:	.89	Confidence:	.90	Total Scale:	.96
Relevance:	.81	Satisfaction:	.92		

In a validation study, differences in two sets of instructional materials with respect to format, content, and other features affecting motivation were reflected in the differences in scores on the IMMS.

Note:

Additional information concerning the development of this survey and the results of the validation study will be included in the next draft of this document.

References

Keller, J.M. (1987). Strategies for stimulating the motivation to learn. Performance & Instruction, 26(8), 1-7.

¹Department of Educational Research, Occasional Paper, April, 1990 (draft).

Keller, J.M. (1987). The systematic process of motivational design. Performance & Instruction, 26(9), 1-8.

IMMS SCORING GUIDE

Instructions: The response scale ranges from 1 to 5. This means that the minimum score on the 36 item survey is 36, and the maximum is 180 with a midpoint of 108. The minimums, maximums, and midpoints for each subscale vary because they do not all have the same number of items.

An alternate scoring method is to find the average score for each subscale and the total scale instead of using sums. For each respondent, divide the total score on a given scale by the number of items in that scale. This converts the totals into a score ranging from 1 to 5 and makes it easier to compare performance on each of the subscales.

There are no norms for the survey. As it is a situation specific measure, there is no expectation of a normal distribution of responses. As data become available from a variety of applications of the scales, descriptive statistical information will be published.

Scores are determined by summing the responses for each subscale and the total scale. Please note that the items marked *reverse* are stated in a negative manner. The responses have to be reversed before they can be added into the response total. That is, for these items, 5 = 1, 4 = 2, 3 = 3, 2 = 4, and 1 = 5.

<p>Attention Items</p> <p>2 15 (reverse) 24 8 17 28 11 20 29 (reverse) 12 (reverse) 22 (reverse) 31 (reverse)</p>	<p>Confidence Items</p> <p>1 13 35 3 (reverse) 19 (reverse) 4 25 7 (reverse) 34 (reverse)</p>
<p>Relevance Items</p> <p>6 18 33 9 23 10 26 (reverse) 16 30</p>	<p>Satisfaction Items</p> <p>5 32 14 36 21 27</p>