

Running Head: A COMPARATIVE ANALYSIS

A Comparative Analysis of the Management of Private and Public Sector Web Course
Management & Design

Rob Power

9236571

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Abstract

There are differences between the design and management of web courses offered by private sector and public sector post-secondary educational institutions. This study consists of a comparative analysis of the web course and instructional design strategy decisions made by the designers and managers of a private sector professional trade skill development web course, and an public sector, graduate level academic web course. These decisions, and their overall effectiveness at meeting the identified needs and objectives of each web course, are analyzed and compared using two cross-referenced theoretical constructs—D.E.C.L. and Phase Theory. This comparative analysis demonstrates that the web course designers and managers of the public sector academic web course made more appropriate and effective decisions with respect to delivery, environment, content, and target learners of their web course.

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A Comparative Analysis of the Management of Private and Public Sector Web Course Management & Design

There are natural differences between the purposes and contents of web courses offered by private sector and public sector educational institutions. Professional trade skill development courses offered by private sector institutions are more likely to focus on concrete course content, whereas academic development courses offered by public sector institutions, such as universities, are more likely to focus on abstract or theoretical subject matter, and the interpretation and application of concepts covered by students. Each type of course serves a different purpose, and attempts to fulfill differing needs. However, it can be counterproductive to try to compare the value, or worth of these purposes—the worthiness of each web course. What is of interest here is the actual natures and relative effectiveness of the web courses designed and managed by private and public sector educational institutions. In this context, it is necessary to examine the decision-making rationale of private and public sector web course designers and managers, to determine whether there are differences in their approaches to web course and instructional design strategies. It is also necessary to examine whether private or public sector web course designers and managers are likely to make more appropriate decisions with regards to web courses, and whether one type of institution is more effective in the implementation of these decisions. To examine these questions, this study compares two web courses, one each that can be classed as a private sector professional trade skill development course, and a public sector, graduate-level academic development course (ed2go, 2002, 2003a, 2003b; MUN, 2002, 2003a, 2003b; Sharpe, 2003). This quantitative and qualitative comparison is conducted using a cross-referencing of two theoretical frameworks—D.E.C.L. and Phase Theory (Mann, *n.d.*, 2000a, 2003b). The results of this comparison indicate that overall the designers and managers of Course B, the public sector, graduate-level academic web course, made more appropriate decisions about web course and instructional design, and that these designers and managers were more effective at implementing these decisions, and fulfilling the identified needs and objectives of their web course.

Purpose

The purpose of this paper is to examine the effectiveness of the design and management of two web courses—one offered as a private sector professional trade development course, the

other offered as a public sector, graduate level academic development course. The examination will be conducted along two major frameworks: D.E.C.L. and Phase Theory (Mann, *n.d.*, 2000a). The examination will look at how each course addresses the elements of Delivery, Environment, Content and Learner, and where the design, delivery and management of each course falls in respect to the Phase Theory taxonomy. The examination will attempt to illustrate the differences between course content, the needs of the learners, and the appropriateness and effectiveness of addressing each of the D.E.C.L. elements with respect to the nature of the contents and learner needs. The comparison does not attempt to evaluate which course, or type of course, is more significant, or plays a more important educational role. Rather, it attempts to look at the overall nature, appropriateness and effectiveness of the instructional design decisions given the particular course contexts.

Research Questions

This study represents an example of quasi-experimental research that uses a combination of quantitative and qualitative research methods (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001). The primary research questions that guide this study focus on the context in which web course and instructional design decisions were made, and the relative appropriateness and effectiveness of these decisions within their given contexts. This study aims to illustrate that different decisions may result from different contexts, and that these decisions may be more or less appropriate and effective within their own contexts. This study does not attempt to evaluate the merits, or worth, of each type of web course—only the merits or worth of the web course and instructional design decisions that were made in each context. To achieve this purpose, the following research questions were used to frame this study:

1. What is the purpose of each course, and how do these purposes differ?
2. What is the intended (target) audience of each course? How do these target audiences differ?
3. How do the designers / instructors / managers of each course address the elements of (Mann, *n.d.*):
 - a) Delivery;
 - b) Environment;
 - c) Content; and

- d) Learners?
4. Where does the design / delivery / management fit with respect to the Phase Theory taxonomy (Mann, 2000a)?
 5. How do the consideration of D.E.C.L. (Mann, *n.d.*), and position on a Phase Theory continuum (Mann, 2000a), interact to address the demands of the content and needs of learners? Are these elements addressed effectively? Which approach (private / public) better addresses the demands of content and learner needs?

The first two research questions are used to establish the contexts in which each web course was designed, and web course and instructional design decisions were made. Questions three and four are used to isolate the actual web course and instructional design decisions within their given contexts. The fifth research question is used to compare the appropriateness and effectiveness of those decisions. As this study does not attempt to evaluate the worth of each web course, the unit of comparison will be the instructional design decisions. A qualitative evaluation of this variable will be made for each course within its given context. This qualitative evaluation represents a summative evaluation of the effectiveness of web course and instructional design decisions—that is, it represents an attempt to delineate the relative appropriateness and effectiveness of the decisions that were made, and to offer suggestions for areas where the types of decisions could be made more effectively to strengthen the ability of designers and managers to meet identified objectives and facilitate student achievement (Gredler, 1996, p.251; Leahy, et. al., 2003; Rothwell & Kazanas, 1998)

Background

Definition of Terms

The following terms are defined in relation to the context of their use in this paper:

Academic Development Course:

A course that delivers contents which are primarily academic, abstract, or theoretical in nature, not intended as part of a professional trade or skills development program (McGreal, 2000, p. 105-107).

Content:

Refers to the subject matter, required mental operations, tasks, or domains included in a course or a unit of study (Mann, *n.d.*, 2003*b*).

D.E.C.L.:

A framework for the planning or analysis of a course or unit of study, referring to the Delivery, Environment, Content, and Learner (Mann, *n.d.*, 2003*b*).

Delivery:

The scope of the instructional chunk, how the instructional chunk relates to the rest of the instructional unit, the sequence of objectives and tasks, and the mix of instructional strategy and media (Mann, *n.d.*, 2003*b*).

Discussion Forum:

An online forum used to facilitate asynchronous communication and collaboration between participants (students, instructors, moderators, etc) in a web course.

Discussion Posting:

A statement, message, or assignment posted by a course participant (students, instructors, moderators, etc.) to a discussion forum.

Environment:

The climate or setting of instruction and learning (Mann, *n.d.*, 2003*b*).

Graduate Level Course:

A course designed as part of a graduate level program, or intended for a target learner audience of students who have already completed university degree programs, and who are now enrolled in graduate level studies at the university level (McGreal, 2000, p. 105-107).

Henri's Model:

A model designed for the analysis of the content of student postings in an online discussion forum based on the five criteria of participative, social, interactive, cognitive and meta-cognitive (Mann, 2003*a*). See Appendix A for further details on Henri's Model.

Learner:

Refers to the characteristics of the target learner, including attitude, capacity, demographics, and competence (Mann, *n.d.*, 2003*b*)

Phase Theory:

A teleological taxonomy used to describe the strategies employed in the planning, design, and management of web courses (Mann, 2000a).

Private Sector Web Course:

A web course offered by a private sector educational institution, such as a private trades college (McGreal, 2000, p. 105-107).

Public Sector Web Course:

A web course offered by a public sector educational institution, such as a university or public college (McGreal, 2000, p. 105-107).

Target Audience:

The intended customers, or learners, for whom a course or instructional unit is designed (Rothwell & Kazanas, 1998, p. 355-356).

Trade Development Course:

A course that delivers content which is primarily aimed at professional skills development, and which is concrete in nature (McGreal, 2000, p. 105-107).

Web Course:

A course delivered via the Internet, which is universally available online, regardless of the learners geographic location, and for which the primary mode of accessing course materials, and participation in course activities, is online (McGreal, 2000, p. 107).

Overview of Theoretical Constructs

Phase Theory and D.E.C.L.

Phase Theory is not a theory pertaining to what works most effectively in terms of approaches to designing and managing web courses. Rather, it is a teleological taxonomy—meaning that it is a theory that attempts to explain the stages that web course designers and managers go through in terms of their approaches to web courses, and the strategies that they use in an attempt to facilitate more effective and efficient learning (Mann, 2000a, p.6). As such, Phase Theory provides a useful framework for the examination of case studies of web courses, and the effectiveness of the strategies used by designers and managers in their attempts to either consciously or unconsciously address the individual components of D.E.C.L. (Mann, n.d., 2003b).

Phase Theory assumes three preconditions related to the design and management of web courses (Mann, 2000a, pp. 3-25). The first is the need, and timeliness of the web course (Mann, 2000a, pp. 3-4). In this analysis, the first assumption could be applied to compare whether there is a need for the particular web course, whether delivery as a web course is actually needed, and whether the web course fulfills identified needs in a timely manner. The second assumption is the use of web course management systems. In this analysis, it would be useful to determine whether or not a web course management system was employed and which management system, if any, was actually used. The third assumption is that principles of instructional design were taken into consideration in the design of the web course, the instructional materials used, and the teaching and learning strategies employed. Again, this assumption can provide a useful window into the effectiveness of design and management strategies at fulfilling the objectives of the web course, and the needs of learners.

Phase Theory describes three phases through which web course designers and managers progress throughout their endeavors with web courses. The first phase is lesson enhancement, in which designers and managers use a web course management system to either present or enhance the same instructional materials that would normally be presented in other formats such as classroom lectures or a textbook (Mann, 2000a, pp. 7-12). Designers and managers operating in the first phase would use a separate web site for the course, and provide such elements as immersive collaborative environments, student presentation areas, and online individual and/or group assessment. The second phase is online resource-based teaching and learning (Mann, 2000a, pp. 13-16). In this phase, designers and managers use multimedia resources, accessed through the course web site, to facilitate teaching and learning. Designers and managers operating in this phase provide online content resources, online resources that support learning activities and learning processes, and online resources that build upon other resources either presented to students, or previously encountered by learners. The third phase is the creation of online learning environments (Mann, 2000a, pp. 17-20). Mann (2000a) describes an online learning environment as:

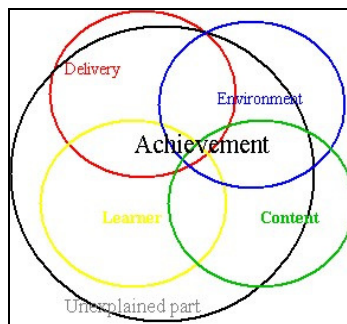
a virtual space where learners work together and support one another as they use a variety of tools and information resources in pursuit of learning goals and problem solving activities (p. 17).

Web courses that fall in the third phase of Phase Theory often provide information banks, symbols pads, construction kits, phenomenaria, online microworlds, or virtual environments.

As noted, Phase Theory is not a prescriptive theory of web course design and management. Rather, it is a descriptive theory that examines the mindset and strategies of designers and managers as they make decisions about what content to present in a web course, what resources to provide to facilitate learner achievement, and what teaching and learning strategies they incorporate into the educational experience (Mann, 2000a, pp. 3-15). Phase Theory is based on principles of web course and instructional design, rather than templates or tools for effective design and instruction. Therefore, in order to apply Phase Theory to a comparative analysis of two web courses, it is necessary to use the taxonomy as a framework for examining the apparent mindsets of their designers and managers, the actual decisions that they made, and the effectiveness of these decisions in facilitating learner achievement and meeting the objectives of the courses. To conduct such a comparative analysis, it would be useful to describe how each web course is designed and what types of web course components and resources are provided to facilitate student achievement. It would also be useful to describe which components of D.E.C.L. are addressed by each of the web course components, and how effectively this has been done.

D.E.C.L. is a theoretical framework that was developed as a means of describing the constituents that must be considered, and addressed, in order for an instructional unit to be successful in fulfilling its mandate—helping the learner to learn the instructional material. The four constituents of D.E.C.L. include the Delivery, the Environment, the Content and the Learner. Mann (*n.d.*, 2003b) explains that achievement is a result of the interplay of the four D.E.C.L. constituents, as demonstrated in the following diagram:

Figure 1: Interplay of the D.E.C.L. constituents (Mann, 2003b)



Because achievement can be directly linked to the appropriateness and effectiveness of web course and instructional design decisions, it is useful to identify which Phase, or operating mindset, designers and managers are making decisions in. It is also useful to break down these decisions into the individual D.E.C.L. constituents which they attempt to address, and to demonstrate how each of these constituents, and their associated decisions, interact to try to facilitate learner achievement. To do this, it is necessary to show what decisions were made with respect to the *Delivery* of the web course—that is, how the designers deliberately attempted to address the size of the instructional chunk and its relationship to the rest of the instructional unit, the sequences of objectives and tasks expected of students, and what role would be played by instructional design (Mann, *n.d.*, 2003*b*). It is also necessary to show what decisions were made with respect to the *Environment* within which learning is to occur—that is, how designers and managers deliberately address the climate or setting of instruction and learning (Mann, *n.d.*, 2003*b*). In this study, the examination of the environment looks at from where learners are most likely to have Internet access, with what levels of technical capacity learners gain Internet access, and what technology requirements are imposed upon learners as a prerequisite for participation. The *Content* of the web course is important to this study as well—that is, it is necessary to examine how designers and managers deliberately address issues of the subject matter covered, the mental operations required of students, and the tasks or domains included in the course or unit of study (Mann, *n.d.*, 2003*b*). In this comparison, these elements are expected to vary significantly. However, it is still possible to determine whether one set of designers and managers were operating within a more appropriate mindset when addressing these issues, and whether the decisions that they made about content were more effective within the given context. Finally, it is necessary to consider how the designers and managers deliberately attempted to address to the *Learner* for each web course—that is, how they attempted to account for the needs and attendant characteristics of target learners (Mann, *n.d.*, 2003*b*). In this study, the needs of the learners will lead to different reasons for participation in a web course, and their characteristics will play a major role in determining which strategies will work most effectively to facilitate achievement (Derry, 1988; Mann, *n.d.*, 2003*b*; Pratt, 1997; Spoon, 1998). What is of concern is the actual differences in these characteristics, whether these elements have been taken into consideration, and whether decisions based on these elements have been as effective as possible in facilitating achievement.

Overview of the Courses

Course A: A Private Sector Trades Development Course

Course A is a private sector course designed to help students develop professional trade skills, and prepare for a universally recognized professional accreditation exam (ed2go, 2002). The course prepares students to handle computer hardware, operating system and network troubleshooting, and is a preparation course for students who intend to take Comptia's A+ Certification Exams. The Advanced A+ Certification Prep course is the third and final course in a series of preparation courses that range from Basic to Intermediate and Advanced skills. It is offered by ed2go, a division of the University College of Cape Breton that offers distance education professional development and personal interest courses. The ed2go syllabus (2002) offers the following information for prospective students:

Ready for a crash course in (almost) every important computer technology in the known world? The Advanced A+ Certification Prep course takes you through an extensive set of technologies, including SCSI, video, modems, printers, multimedia, portable PCs, and networking. You'll study the hardware and learn the software necessary to install, configure, and troubleshoot that hardware. This course completes your understanding of the hardware and operating systems tested on the A+ Certification exams.

Although ed2go is an extension of the University College of Cape Breton—a public sector post-secondary institution—it operates in a similar manner to many private sector institutions, making Course A an excellent example as a case study of a private sector trades development course. In addition, the instructor for Course A works for a separate organization called Total Seminars Inc., and teaches the course on contract for ed2go (ed2go, 2002).

Course A is offered completely online over a period of six weeks (ed2go, 2002; McGreal, 2000). The course is divided into twelve lessons, with two lessons released per week over the twelve-week period. It is a non-credit course offered by ed2go, and completion of the series of courses does not lead to A+ Certification. Students must complete the A+ Certification Exams administered by Comptia—an independent non-profit organization formed with a mandate of developing industry standards for the certification of computer technicians (ed2go, 2002).

Course B: A Public Sector Academic Development Course

Course B is a public sector, graduate level academic development course called Principles of Programme Design & Development (Sharpe, 2003). The course is offered through the Faculty of Education at Memorial University of Newfoundland as part of the Master of Education: Post-Secondary Studies programme. It is also offered as an elective course for graduate students enrolled in other Master of Education programs. The introduction to Course B (Sharpe, 2003) offers the following information for new students:

This course is... an introduction to the essentials of programme development that might be applied to a whole range of educational circumstances and situations. Much of the content is generic to almost any programme development situation, and a number of previous course students have used their knowledge and skills from this course to develop programmes within their respective educational institutions or places of business.

Although the focus of Course B is on the development of knowledge and skills related to programme design and development, the course does provide an excellent case study of a web course that is primarily academic, abstract or theoretical in nature. The course is not designed to develop specific trades-related skills, it is not part of a requirement for a professional designation, and the content is not concrete in nature. Rather, it is a graduate level university course in which students study and construct knowledge and understanding of the principles underlying the areas of programme design and development (Sharpe, 2003).

Course B is offered primarily online through the Faculty of Education at Memorial University of Newfoundland (McGreal, 2000; Sharpe, 2003). Students are required to purchase one course textbook, with the remainder of the course materials being accessible online. The course also consists of two mandatory teleconference sessions, which students can participate in from any geographical location or time zone.

Methodology

Data Collection

Selection of Case Studies

Two case study web courses were selected for this research. The first is a private sector professional trade skill development course. The second is a public sector, graduate level

academic development course. The courses selected for this research were both web courses in which the author was enrolled during the period of May to August of 2003. Courses were selected based on the availability of access to the course web sites, and data pertaining to the purpose, intended audiences, design, and learning activities incorporated. The two courses will be referred to in the Analysis section of this research as Course A and Course B. The selection of these particular web courses represents an example of convenience sampling (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001). As such, they cannot be truly considered representative of private or public sector web courses in general. The selection of these courses was made in an attempt to illustrate that web courses can be designed in different contexts, and that these contexts can lead to different operating mindsets, and web course and instructional design strategy decisions. Because convenience sampling was used to select the case studies, it was not possible to choose web courses that are equal in either instructional value, available web course and instructional design resources, or the dedication of time and expertise to making instructional design decisions. However, no attempt is made to evaluate the relative worth, or value, of the two web courses.

Web Course Purpose and Intended Audiences

Data on the purposes and intended audiences of the two web courses were collected from the syllabi published on each course web site, and from descriptions of the prerequisites for course enrollment presented in the syllabi, course descriptions offered to prospective students by the educational institutions, and the Memorial University of Newfoundland *Calendar Regulations, 2002-2003* (MUN, 2002).

Number of Participating Learners

Data are unavailable on the exact number of participating learners for Course A. An attempt was made to contact ed2go at the University College of Cape Breton, but that institution was unable to provide figures on student enrollment. Data on the number of participating learners for Course B were collected from that course's internal email list, and from student introductory postings to the course discussion forum.

Course Design and Functionality

Data on the design, functionality, and integrated components were collected from an examination of the two course web sites, and from screen shot images of various pages associated with the course web sites.

Nature of Student Participation

Data on the nature of student participation were collected from descriptions of assignments and evaluation criteria published on each course web site. Data were also collected by compiling sample student postings to folders in each course's discussion forums. For the purposes of this research, these compilations consist of all student postings to two folders in each course's discussion forums. Finally, data on the nature of student participation were collected from an examination of the types of assignments posted by students to discussion forums or other presentation areas on the course web sites.

Ethical Considerations

In any research scenario, certain ethical considerations must be taken with respect to the collection of data, and the participants in the research (Bieger & Gerlach, 1996, pp. 227-233; Leedy & Ormrod, 2001, pp. 107-111). For this comparative analysis, it was not possible to obtain consent from the learners enrolled in the two web courses. This measure would need to be ensured if this research were ever expanded or carried out with the intention of analyzing actual levels of student achievement, or if this study were intended for publication. In order to ensure that ethical considerations have been taken into account in this scenario, data related to student evaluations or achievement have been omitted, as have the contents of any actual student postings to course discussion folders. In addition, in order to ensure the anonymity of course instructors and participating students, the courses themselves will be referred to in this study as Course A and Course B. A sample consent form for potential future study participants is presented in Appendix B.

Data Analysis

Identification of Web Course Needs, Objectives and Target Audiences

The needs, objectives and target audiences addressed by each web course are identified through a qualitative analysis of statements of the purposes of each course, as presented

in the syllabi published on the course web sites. In addition, data on prerequisites for enrollment are analyzed to determine the target audience for each course. From these analyses, it is possible to derive more concrete statements of the gaps, or needs, which the courses are intended to rectify, the specific objectives of participation in and completion of the courses, and the learners to whom each course is targeted. These concrete statements can then be compared to determine the similarities and differences in these components. These statements can also be used to guide the analysis of the effectiveness of web course and instructional design decisions (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001; Rothwell & Kazanas, 1998).

Phase Theory Comparisons

Data on the design and functionality of each web course, as well as the nature of student participation in the courses, are analyzed within a Phase Theory framework to determine which phase or phases of web course design and management are evidenced through the components integrated into the web courses (Mann, 2000a, pp. 3-25). These analyses are used to try to determine the mindsets of the course designers and managers that led to specific web course and instructional design decisions. These analyses are also used to show evidence of the differences in how principles of web course design and management are applied between typical private sector professional trade skills web courses, and public sector graduate level academic web courses (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001).

How D.E.C.L. Components Have Been Addressed

The decisions made by the web course designers and managers, as delineated through the analysis of the Phase Theory Comparisons outlined above, are qualitatively analyzed to determine how each decision addresses the components of the D.E.C.L. framework (Mann, *n.d.*, 2003b). These analyses can later be compared to the needs, objectives, and target audiences that have been delineated for each course, to determine the appropriateness and effectiveness of web course and instructional design decisions for each given context (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001).

Nature of Student Participation

The nature of student participation is analyzed in two ways. First, samplings of student postings to two discussion folders from the discussion forums of each web course are

examined to provide statistics on the total number of postings over the duration of each course (ed2go, 2003a, 2003b; Memorial University of Newfoundland, 2003a, 2003b). The natures of these postings are also analyzed using Henri's Model (Mann, 2003a) to provide for a comparison between the two web courses. Second, the nature of student participation is examined through an analysis of descriptions of course assignments and evaluation, and the methods of submitting and disseminating assignments, as described on the course web sites. This information can shed light on the differences in the tasks, mental operations and levels of participation required of students by the two web courses. This information can also be compared to the Phase Theory and D.E.C.L. frameworks, and to the delineated needs and objectives addressed by each web course (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001; Mann, *n.d.*, 2000a, 2003b).

Comparison of the Effectiveness of Web Course and Instructional Design Decisions to Identified Course Objectives and Learner Needs

This component of the data analysis uses a combination of quantitative and qualitative analyses to compare the results of the previous three components (Phase Theory Comparison, How D.E.C.L. Components are Addressed, and Nature of Student Participation) to the concrete statements of the needs, objectives and target learners for each web course. This is done in an effort to determine whether or not the decisions made by the designers and managers of each web course were appropriate and sound given the context in which each web course was implemented. This is also done to determine whether there is a difference between the appropriateness and effectiveness of the web course and instructional design decisions made by designers and managers in private and public sector courses (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001; Mann, *n.d.*, 2000a, 2003b).

Comparison of the Effectiveness of Web Course and Instructional Design to Actual Implementation

This component of the data analysis also uses a combination of quantitative and qualitative analyses to compare the results of the previous three components (Phase Theory Comparison, How D.E.C.L. Components are Addressed, and Nature of Student Participation) to the specific web course and instructional design decisions that were made with respect to the two web courses. This is done in an effort to determine the

effectiveness of the web course and instructional design elements at fulfilling the purposes for which designers and managers decided to integrate them. This is done to demonstrate whether there is a difference between the overall effectiveness of the implementations of decisions made by designers and managers for private and public sector web courses (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001; Mann, *n.d.*, 2000a, 2003b).

Limitations of the Study

There are a number of factors that could impose limitations to the internal and external validity of the data used in this research, and the results of this study (Bieger & Gerlach, 1996, pp. 77-85; Leedy & Ormrod, 2001, pp. 103-106, 174-210, 230-236). Of primary concern is the limitation on the size and methods of sampling used. A larger sample size of both private and public sector web courses would be desirable to increase the internal and external validity of this study and its results. A larger sample size of discussion postings would also be desirable to address issues of validity. It would also be desirable to integrate more data collection methods, such as interviews with course designers, managers, instructors, and students. These methods could be used to increase the quality of data on elements ranging from the intended objectives and target audiences of each web course, to the rationale used for specific design and implementation decisions, and the reactions of students to these decisions and their perceived appropriateness and effectiveness. It would also be advisable to collect and compare, where possible, data on actual student achievement levels.

As this study relies on convenience sampling (Bieger & Gerlach, 1996; Leedy & Ormrod, 2001) for the selection of web course case studies, the results cannot be truly considered generalizable as a comparison of all private and public sector web courses. However, this study can be used to effectively illustrate that web courses may be designed for different purposes and target audiences, and that these differences in context may coincide with, or result in different operating mindsets amongst designers. These differing contexts can also result in different web course and instructional design decisions, with differing degrees of appropriateness and effectiveness within the given contexts.

Analysis of the Courses

Identification of Web Course Needs, Objectives and Target Audiences

The syllabus for Course A describes it as a comprehensive course covering the advanced skills that students will need to develop in order to successfully complete Comptia's A+ Certification Exams (ed2go, 2002). The need for this course would be a public demand for a course that would prepare students for completion of those exams in order to receive industry standard certification. In the context of such a private sector, post-secondary professional trade skills development course, the need for the course would be determined by designers and managers based on the labor force demand for qualified A+ computer technicians, and by public demand, which would determine the base level of potential paying customers for the course. In addition, the needs for this course would also encompass student expectations or needs from participation. In this case, those needs would be to develop competencies in concrete trades-related skills. As outlined in the syllabus for Course A, these skills involve the ability to diagnose and trouble "an extensive set of technologies, including SCSI, video, modems, printers, multimedia, portable PCs, and networking" (ed2go, 2002). The objectives for this course would obviously be the development of knowledge and competencies in these technical skills. The target audience for Course A would have two major constituents. The first would be students who intend to complete Comptia's A+ Certification Exams and seek employment as a certified computer technician. The second, and likely smaller constituent of the target audience would be individuals enrolling in the course out of general interest in computer technology and troubleshooting skills. One other data source provides information on the target audience for Course A. That is the online description of the prerequisites for enrollment in the course, which are the successful completion of two previous courses covering Basic and Intermediate level skills.

The syllabus for Course B describes it as a graduate level course covering the principles of programme design and development. The designer and instructor for Course B explained that the course was developed because of a need for educators and educational administrators skilled in principles that could be used in the development and implementation of effective educational programmes, and because of a lack of quality resources on this subject matter available to the public (Sharpe, personal conversation). The objectives of Course B are also delineated in the

online syllabus, and include the development of an understanding of the principles behind the components of generic models of programme design and development, and the stages involved in following such models in order to effectively identify needs and develop and implement programme solutions. Data from the course syllabus, and from Memorial University of Newfoundland's *Calendar Regulations* (MUN, 2002) can be used to identify the target audience for this course. The syllabus says that the course is "part of a group of "closed electives" on the M.Ed. Post-secondary Studies programme, and is often used as an elective on other graduate programmes" (Sharpe, 2003). The university *Calendar Regulations* (MUN, 2002) also specify that in order to enroll in graduate level courses, prospective students must have completed an appropriate baccalaureate degree program from an accredited institution, have met entrance requirements in terms of grades and grade point averages in their undergraduate studies, and be accepted into a graduate level program of study at the university.

From these analyses, it becomes apparent that there are significant differences between the needs, objectives and target audiences for Course A and Course B. While the former is necessitated by public demand for skilled workers and opportunities to develop concrete professional skills, the latter is necessitated by a perceived gap in the knowledge and collaborative skills needed by professional educators to design and implement effective organizational programs. While the objectives of Course A center on student mastery of concrete skills, the objectives of Course B center on the development of knowledge of more abstract concepts, effective collaborative teamwork, and the rationale for using specific problem-solving strategies. Finally, while the target audience for Course A consists of prospective computer technicians and students taking the course out of general interest in computer technology, the target audience for Course B consists of professional educators who have already obtained one, or more, undergraduate or graduate degrees, and who need to enroll in the course in order to fulfill the requirements of a graduate degree program. Concrete statements of the needs, objectives and target audiences for Course A and Course B are compared in Table 1 below.

Table 1: Needs, Objectives and Target Audiences

	Course A	Course B
Needs	<ul style="list-style-type: none"> - Public demand for skilled computer technicians. - Public demand for an A+ Certification Prep course. 	<ul style="list-style-type: none"> - Perceived gap in programme design and development skills. - Lack of available resources on the principals of programme design and development.
Objectives	<ul style="list-style-type: none"> - Development of technology-related diagnostic, troubleshooting, and repair skills. 	<ul style="list-style-type: none"> - Development of knowledge of abstract concepts. - Development of collaborative teamwork and use of problem-solving strategies.
Target Audiences	<ul style="list-style-type: none"> - Prospective computer repair technicians. - Students enrolling out of general interest. 	<ul style="list-style-type: none"> - Graduate level university students.

Phase Theory Comparisons

As previously noted, Phase Theory assumes three preconditions related to the design and management of web courses (Mann, 2000a, pp. 3-25). There is evidence from the data collected that all three of these assumptions have been met by both Course A and Course B. As outlined in the preceding section, a need has been identified and justified for each of the web courses. The courses can also be justified as timely in terms of their fulfillment of those needs. In addition, there is a question as to the need to deliver these courses as web courses. Again, this mode of delivery can be justified in both cases. Course A aims to provide access to technical skills development opportunities for a widely dispersed audience that is unable or unwilling to enroll in on-campus studies, or that finds participation in such courses via the Internet more practical or desirable (ed2go, 2002). Course B is designed for graduate level education students, many of whom are employed as teachers, and are unable to attend classes on campus (MUN, 2002; Sharpe, 2003). The second assumption pertains to the use of web course management systems. In the case of Course B, the WebCT™ course management system is employed to deliver and manage the course. WebCT™ is a course delivery and management system that provides secure access to courses, and management of course materials and student data (Mann,

2000*b*, viii-xi). Course A also appears to use a web course management system, although data on the specific system employed is not available. The third assumption of Phase Theory is that principles of instructional design were taken into consideration in the design of the web course, the instructional materials used, and the teaching and learning strategies employed. This precondition can be assumed, and descriptions of how each course meets this precondition can be examined within the context of the placement of the web courses on a Phase Theory continuum (Mann, 2000*a*, pp. 3-25).

Data collected from the two web courses can be analyzed within the Phase Theory framework, which can be used to describe the types of components integrated into the web courses, and the nature of the decisions related to those components that were made by designers and managers (Mann, 2000*a*, pp. 3-25). It is possible to identify the components integrated into the design of each web course, and to identify to which phase or phases they most likely belong. A cursory examination of the nature of student participation can also provide clues as to the instructional strategies employed by the web course designers and managers, and to which phase those strategies belong.

Data collected from Course A provides evidence that designers and managers made web course and instructional design strategies that are consistent with Phase One: Lesson Enhancement. For example, Figure 2 and 3, below, illustrate examples of the typical instructional content delivered by Course A. This content is text-based, with an incorporation of appropriate graphics to show learners what specific computer components look like, and to illustrate concepts about the functionality of those components (ed2go, 2002). Despite the fact that this content provides a mix of text and images, the content itself does not differ in any way from that which learners would encounter through other instructional media, such as lectures or textbooks (Mann, 2000*a*, pp. 3-25). In fact, the content for Course A is taken directly from one of the more popular A+ Certification preparation books available to learners from any major bookstore (ed2go, 2002).

Figure 2: Typical Course A Content (ed2go, 2002)

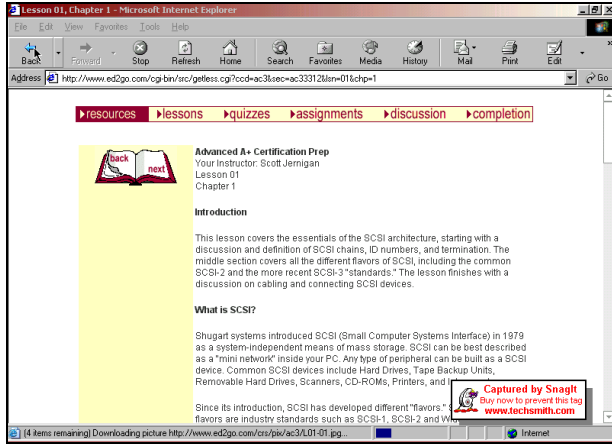
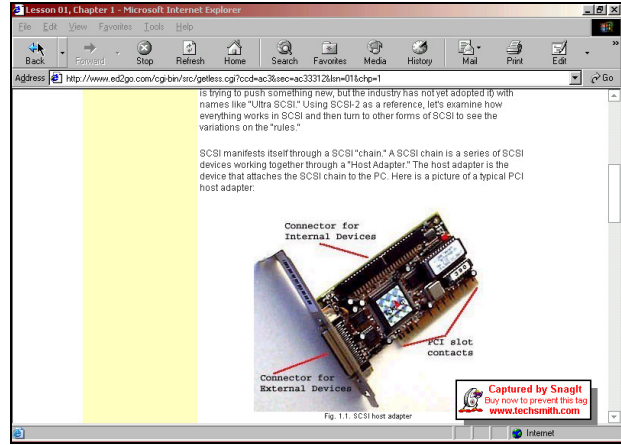


Figure 3: Typical Course A Content (ed2go, 2002)



Aside from the specific instructional content, Course A exhibits other characteristics of the first phase of Phase Theory. For example, the designers and managers of Course A provide an online immersive collaborative environment for students, by way of a course discussion area illustrated in Figure 4, below. Course A also provides such components as online individual assessment, by way of short-answer quizzes for each of the twelve lessons, as illustrated in Figure 5, below.

Figure 4: Immersive Collaborative Environment in Course A (ed2go, 2002)

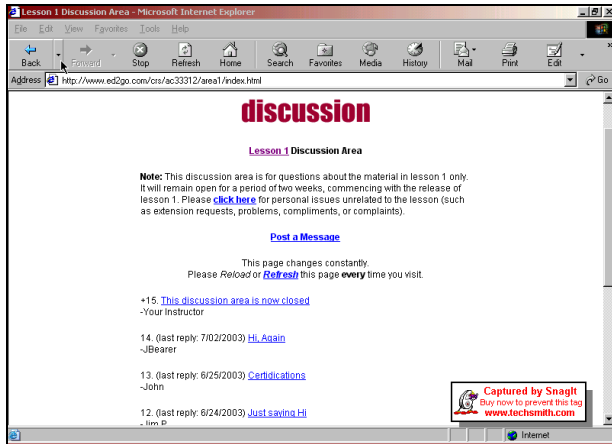
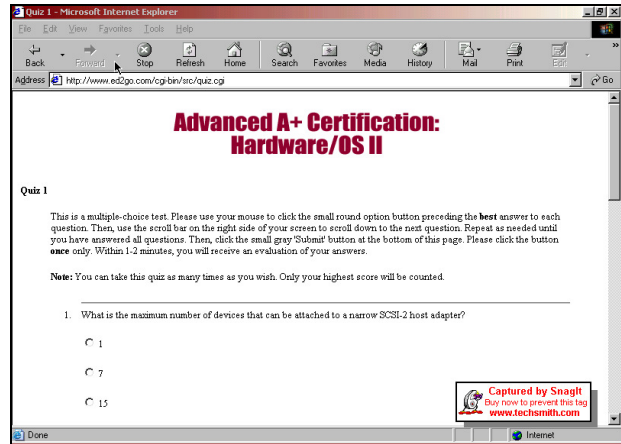


Figure 5: Online Individual Assessment in Course A (ed2go, 2002)



There is only cursory evidence available from the data collected from Course A to indicate that designers and managers are operating in the second phase of Phase Theory. Phase

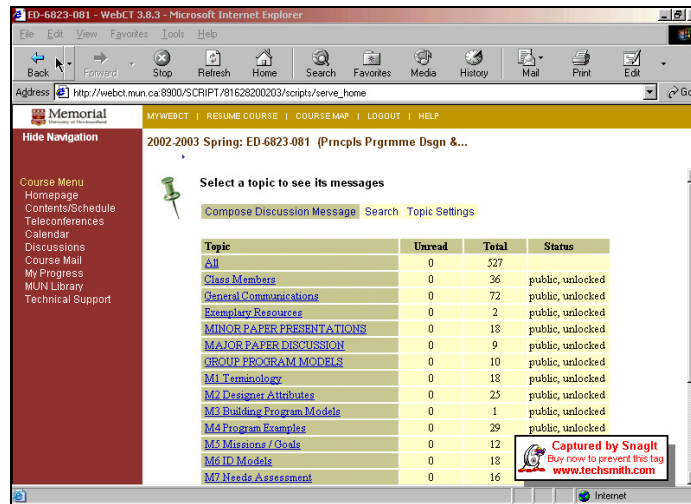
Two entails the integration of online resource-based teaching and learning (Mann, 2000a, pp.3-25). In the case of Course A, the only integrated components that could be categorized as belonging to the second phase of web course design and management are the inclusion of links to external resources. Many of the individual lessons in Course A contain links to the web sites of major technology companies, and other online information, as a means to provide learners with access to additional technical information (ed2go, 2002). However, these links are provided mostly to satisfy the general interests of students who wish to go beyond the materials and skills covered by the course itself. These online multimedia resources are not used to facilitate teaching and learning, nor are they used to support online learning activities, or to build upon other resources encountered by students (Mann, 2000a, pp. 3-25). It appears as though these online resources were incorporated into the Course A's web site as an afterthought, with little, if any, thought given to instructional strategy or pedagogical value.

Finally, Course A exhibits none of the characteristics attributed by Mann (2000a, pp.17-20) to the third phase of Phase Theory. Learners participating in Course A interact with the course by reading posted lessons, and completing online unit quizzes. As described in a later section, there is little evidence of student interaction in Course A in the pursuit of "learning goals and problem solving activities" (Mann, 2000a, p.17). Neither does Course A exhibit any of the characteristic components of Phase Three, such as information banks, symbols pads, construction kits, phenomenaria, online microworlds, or virtual environments.

Like Course A, Course B also exhibits characteristics attributed to Phase One web course design and management. However, unlike Course A, Course B does exhibit characteristics of higher level phases. In terms of Phase One, Course B does present instructional materials that would also be presented to students in other class formats (Mann, 2000a, pp. 3-25). For example, there is a required textbook for Course A, from which much of the instructional material is drawn. However, the web course management system, in this case, is used by the instructor to enhance that material by presenting students with further information, and with activities that enable students to understand and interpret the instructional materials in different contexts. Course B also includes components, such as an online immersive collaborative environment (Mann, 2000a, pp. 3-25), as illustrated in Figure 6, below. Student presentation areas are provided, in that students in Course B post weekly assignments, and major papers and presentations, to the course discussion forum. In the case of Course B, however, no provision is

made for online individual or group assessment, other than that internal course email is used by the instructor to return grades, and comments for assignments to students.

Figure 6: Immersive Collaborative Environment in Course B



Data collected from Course A point to the presence of components that are characteristics of the second phase of Phase Theory (Mann, 2000a, pp. 3-25). For example, multimedia resources are accessed through the course web site to facilitate teaching and learning. In this case, those resources consisted of diagrams and document files that students could download and view either on screen, or as a printout, as they completed activities for many of the course modules. These resources provided online content for the course, provided support for learning activities, and were used to build upon other resources and instructional materials used by students. Examples of such resources are illustrated in Figures 7 and 8 below.

Figure 7: Online Resource in Course B

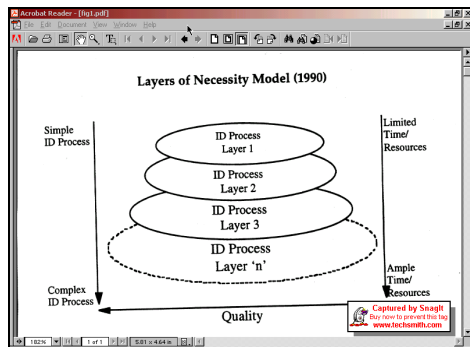
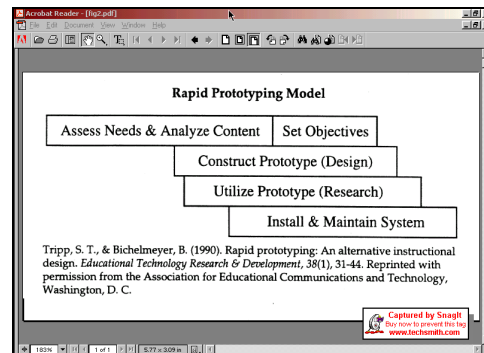


Figure 8: Online Resource in Course B



Finally, Course B does exhibit some of the characteristics described by Mann (2000a, pp. 17-20) under Phase Three. Students do interact in a virtual space—in this case mostly within the course discussion forum—using a variety of information sources “in pursuit of learning goals and problem solving activities” (p. 17). Students are required to work in teams to interpret information from a variety of resources, and to create their own models of the programme design and development process. In turn, students use these models as the basis for case study scenarios, wherein they describe the development of their own original programmes. However, it is worth noting that Course B does not provide such components as symbols pads, construction kits, phenomenaria, online microworlds, or virtual environments, for use by students in their collaborative learning efforts.

It appears from an examination of the data from Courses A and B that the designers and managers of the web courses were operating within different mindsets as they made decisions about web course and instructional design strategies (Mann, 2000a, pp.3-25). The designers and managers of the two web courses appear to have applied the principles of web course design and management differently in each case. While Course A predominantly exhibits the characteristics of the first phase of Phase Theory, with some evidence of second phase characteristics, Course B exhibits characteristics of all three phases. A summary of the phase characteristics exhibited by both web courses is presented in Table 2 below. Understanding the significance of these differences requires their examination under the D.E.C.L. framework (Mann, *n.d.*, 2003b), which will be presented in the next section.

Table 2: Phase Theory Characteristics of Courses A and B

	Phase 1-----	Phase 2 -----	Phase 3
Course A	xxxx	x	
Course B	xxxx	xxx	xx

How D.E.C.L. Components Have Been Addressed

The Delivery

The first component of the D.E.C.L. framework is the *Delivery* (Mann, *n.d.*, 2003*b*). This component refers to how instruction is actually delivered to the target learners. By examining the data collected from the two web courses, it is possible to compare the decisions that have been made with regards to the size of instructional chunks, and how those chunks relate to the rest of the instructional unit. It is also possible to compare the sequences of objectives or tasks that learners are expected to accomplish, as well as the roles played by instructional strategies employed in each course. In addition, it is possible to compare the role played by decisions regarding the integration of different media into instructional strategy. Each of these elements has been identified for the two web courses as part of the Phase Theory Comparisons outlined in the previous section. The analysis in this section will shed light on how those elements, and the positioning of each web course with respect to Phase Theory, have accounted for the delivery component of D.E.C.L.

As illustrated for Course A, instructional chunks are comprised of lessons released to students twice per week (ed2go, 2002; Mann, *n.d.*, 2003*b*). These lessons are primarily text based, with the integration of images or graphics where needed to illustrate the appearance of particular pieces of technology, or to illustrate technology-related concepts. These instructional chunks ranged in length from between 16 to 40 pages, depending on the subject matter of the lesson. Although each lesson covered separate technological issues, the twelve lessons were arranged so that they could, to some degree, build upon each other in order to facilitate greater learner understanding of the issues and skills covered. As previously noted, the delivery of instructional chunks, or content, can best be characterized within the first phase of Phase Theory: Lesson Enhancement (ed2go, 2002; Mann, *n.d.*, 2003*b*).

In the case of Course B, a similar strategy was implemented with regards to determining the size and actual delivery of instructional chunks (Mann, *n.d.*, 2003*b*; Sharpe, 2003). The fourteen-week course was divided up into fourteen weekly modules. Content for each module consisted of a 1-2-page overview, instructions, and activities, posted to the discussion forum by the instructor. Content also consisted of a number of chapters assigned for reading from the course textbook, along with supplementary resources such as document files, diagrams, and a

listing of student presentations related to the module topics. In the case of Course B, the modules were organized in a deliberate manner so that the concepts covered would build upon each other, and lead to greater student understanding of the principles and processes involved in programme design, development and implementation (Mann, *n.d.*, 2003*b*; Sharpe, 2003). While the methods of dividing up course content into discrete chunks for delivery may be similar between Course A and Course B, the characteristics of these chunks in relation to Phase Theory are somewhat different. Course B incorporates characteristics of all three phases into the instructional units (Mann, *n.d.*, 2000*a*; 2003*b*; Sharpe, 2003). The instructor's module postings represent the lesson enhancement characteristics of the first phase, as does the use of an immersive collaborative environment to discuss weekly topics and to post responses to weekly questions. However, these instructional chunks also display characteristics of resource-based teaching and learning, in that a variety of resources are drawn into each module, many of which could be accessed online by students. In addition, students do collaborate in what can be classed as a virtual learning space, to construct understanding of the concepts covered in weekly modules, and apply those concepts in pursuit of their overall learning objectives and problem-solving activities—characteristics of the third phase of Phase Theory.

The positioning of Courses A and B with respect to Phase Theory point to differences in the sequences of objectives or tasks that students are expected to complete, and to differences in the roles played by instructional strategies in each course (ed2go, 2002; Mann, *n.d.*, 2000*a*; 2003*b*; Sharpe, 2003). For example, in Course A, students are expected to complete two sets of readings, or lessons, per week. A number of practical activities are listed to accompany each set of readings, however, these activities are not submitted or evaluated at any point in the course. Once students have completed each lesson, they are expected to complete an online, short-answer quiz consisting of five questions. Once all lessons have been completed, students are expected to complete an online, short-answer final exam that covers all of the course material. The instructional strategy employed in Course A consists of little more than lecture-style lessons, followed by testing of student comprehension. Again, this instructional strategy is characteristic of the first phase of Phase Theory (Mann, 2000*a*). In addition, the instructional strategy makes little use of the capabilities on online instruction to facilitate communication and collaboration between learners and instructors, or to access a wealth of learning resources.

In Course B, learners are expected to complete the weekly module readings, as well as post responses to a variety of questions and activities designed to get learners to apply, and further their understandings of the module topics (Mann, *n.d.*, 2003*b*; Sharpe, 2003). Concurrent to this series of weekly modules, learners are expected to complete a number of assignments, including first a descriptive paper on one of the major topics covered by the course, which students must post to the discussion forum as an additional learning resource for their peers. The second assignment consists of an ongoing collaborative effort between groups of students who are expected to devise, explain, and justify their own group models of the programme design and development process. The third assignment consists of a major course paper, in which students use the programme development model devised by their groups to explore the design, development and implementation of a case study scenario which they themselves must propose. Finally, in the last week or so of the course, students must complete an online exam, which consists of a case study scenario delivered to them by the instructor using the internal course email. Students have a designated time span in which to explain how they would apply the topics covered throughout the course to that case study. Unlike with Course A, the sequence of tasks and objectives for Course B, and the instructional strategies they represent, show characteristics of more than one phase under Phase Theory (Mann, *n.d.*, 2000*a*; 2003*b*; Sharpe, 2003). The objectives and instructional strategies integrate a problem-based, collaborative learning approach, and show careful consideration of the principles of constructivist learning theory (Dalgarno, 2002; Duffy & Cunningham, 1996). The use of web course delivery mode, in the case of Course B, appears more thoroughly planned to maximize the capabilities of online education to facilitate communication, collaboration, access to learning resources, and the establishment of an effective learning environment.

The Environment

The second component of the D.E.C.L. framework is the environment (Mann, *n.d.*, 2003*b*). In this context, it is worthwhile to examine the similarities and differences between the climates or settings in which learning is likely to occur for students enrolled in the two web courses. One element that is consistent between the two courses is the requirement to have access to a personal computer, and to the Internet (ed2go, 2002; Sharpe, 2003). As both courses are offered as distance education opportunities, it is likely that students will access the course

web sites using a home-based personal computer and Internet access. However, it is likely that a high percentage of students enrolled in Course B will be currently employed as teachers, and that some may gain access to the course web site using a personal computer with Internet access located in a school-based computer laboratory (MUN, 2002; Sharpe, 2003). Other settings for computer and Internet access are possible, but these scenarios are the most likely, and the most relevant ones for web course designers and managers to take into consideration. Also worth considering in this context are the technology requirements imposed upon learners as a prerequisite for enrollment, and the nature of the platforms through which each web course is delivered. In Course A, there are no prerequisite technology-related requirements other than access to a personal computer with Internet access (ed2go, 2002). In Course B, students must have the access to the same resources (MUN, 2002; Sharpe, 2003). In addition, some students enrolled in Course B come from programs of study other than the Master of Education in Post-Secondary Studies program (Sharpe, 2003). Students who enroll in the course as an elective under programs such as the Master of Education in Information Technology Program are required to have either completed a previous diploma in Information Technology, or provide proof of a minimum set of technology-related competencies (MUN, 2002).

These elements are taken into consideration to differing degrees by Course A and Course B. For example, the designers and managers of Course A assume an environment of home-based computer and Internet access for learners who are widely geographically dispersed (ed2go, 2002). In this respect, all course materials are accessible from the course web site. In addition, provision is made for students to access and submit all evaluated assignments online, and provision is made through the course web site for students to communicate with each other, and with their instructor. These provisions effectively eliminate the barriers imposed by having a widely dispersed student body, and by lack of access to instructors in a classroom setting. Similar assumptions and provisions are made in the case of Course B (MUN, 2002; Sharpe, 2003). With the exception of the course textbook, and participation in two mandatory teleconference sessions, all course materials can be accessed via the course web site. In addition, provisions are made through the web site for communication and collaboration between learners and the instructor, and for the accessing and submission of evaluated assignments. The designers and managers of the two web courses, though, do pay different levels of attention to the potential benefits of their environmental contexts (ed2go, 2002; Mann, *n.d.*, 2000*a*, 2003*b*; Sharpe, 2003).

As previously noted, the designers and managers of Course A pay little attention to the potential for the online learning environment to facilitate communication, collaboration, and access to a wealth of learning resources. The opposite can be said with respect to Course B, where instructional strategies appear to have been employed in an effort to maximize these potential benefits.

The Content

The third component of the D.E.C.L. framework is the Content (Mann, *n.d.*, 2003*b*). This component refers to the nature of the subject matter delivered to students, the mental operations and tasks required of students, and the cognitive domains to which the other elements apply. It can be assumed that different subject matter, and course objectives, will call for different mental operations, tasks, and the consideration of different cognitive domains. This is evidenced through the data collected from Courses A and B (ed2go, 2002; Mann, *n.d.*, 2000*a*, 2003*b*; Sharpe, 2003). For example, the subject matter addressed by Course A is technical and concrete in nature, and is related to professional skill development (ed2go, 2002). The subject matter addressed by Course B is more abstract, theoretical, and academic in nature, and is related to the development of collaborative teamwork and problem-solving strategies (Sharpe, 2003). These factors appear to have been taken into consideration by the designers and managers of each web course.

In Course A, the mental operations and tasks expected of students fall towards the lower end of a scale of thinking skills, such as Bloom's Taxonomy (ed2go, 2003; STEM~Net, 2003). Students are required to read, memorize, and confirm comprehension of the instructional materials presented. These requirements are indicative of such thinking skills as knowledge and information gathering, and comprehension-confirming application, as outlined in Bloom's Taxonomy. These content requirements appear to be reflected in the decisions made with regards to web course and instructional design strategies, which fall predominantly within the first phase of Phase Theory. In Course B, the mental operations and tasks expected of students fall towards the higher end of the thinking skills outlined in Bloom's Taxonomy (Sharpe, 2003; STEM~Net, 2003). Learners are expected to apply the knowledge gained from their studies to new situations, they are expected to synthesize that knowledge into a more comprehensive, applied whole, they are expected to evaluate that knowledge, and they are expected to judge the

outcomes of the application of the knowledge they construct. The requirement for the use of such higher order thinking skills is reflected in the decisions made by designers and managers with respect to web course and instructional design strategies (ed2go, 2003; Mann, *n.d.*, 2000*a*, 2003*b*; Sharpe, 2003; STEM~Net, 2003). Course B exhibits characteristic components of all three levels of Phase Theory, indicating that designers and managers are aware of, and have accounted for the capacity of online collaborative learning, and access to online learning resources, to facilitate learner application of higher order thinking skills to learning objectives and problem-solving activities.

The Learner

The final component of the D.E.C.L. framework is the Learner (Mann, *n.d.*, 2003*b*). This component refers to the needs and characteristics of learners, both of which have consequences for instructional design strategies (Blank & James, 1993; Derry, 1988; Mann, *n.d.*, 2003*b*; Pratt, 1997; Spoon, 1998). Data collected from the two web courses suggest different ranges of learner needs, and potential differences in typical learner characteristics for each course (ed2go, 2002; MUN, 2002; Sharpe, 2003). In both cases, it appears that these needs and characteristics were taken into consideration by the course designers and managers. For example, the target learners for Course A have been identified as prospective computer technicians, and people enrolling in the course out of general interest in computer technology (ed2go, 2002). These target learners require knowledge of specific concrete information, and need to develop specific sets of technical skills. As the target learners are enrolling in a web course, it can also be assumed that they need access to trade skill development opportunities otherwise not available to them because of time or location-related constraints. As the target learners are likely to be widely geographically dispersed, and as they are enrolling in Course A with the intention of seeking professional certification and prospective employment in a trade, certain assumptions could be derived about their typical learner characteristics (Blank & James, 1993; Derry, 1988; Pratt, 1997; Spoon, 1998). For example, they are less likely to have high levels of higher educational experience, they are likely to be younger students, and they are likely to come from diverse social and cultural backgrounds. These characteristics must be taken into careful consideration when determining what instructional design strategies to employ, as they will have an impact upon learner achievement. It appears that these factors have been taken into account in the

design and management of Course A, which can best be categorized by the characteristics of Phase One web course design and management (ed2go, 2002; Mann, *n.d.*, 2000*a*; 2003*b*). Instructional materials and resources are limited to the presentation of the specific concrete information needed by learners, who are not required to participate in high levels of collaboration, problem-solving, or the application of higher order thinking skills, in order to achieve learning objectives.

The target learners for Course B, meanwhile, have been identified as graduate level university students enrolled in a Masters Degree program (MUN, 2002; Sharpe, 2003). These learners require not only specific information, but the development of the higher order thinking skills needed to apply that information, and their educational experiences, to their chosen career paths. These learners also have higher levels of previous experience with higher education, collaborative learning and problem-solving activities, and are likely to be more comfortable with a broader range of learning styles and instructional strategies (Blank & James, 1993; Derry, 1988; Pratt, 1997; Spoon, 1998). Again, the target learners for Course B are likely to be geographically dispersed and bound by time constraints as a result of their chosen careers, which appears to have been taken into account through the decision to present the course as a web-based course. The educational experience and needs of the target learners also appears to have been given due consideration by Course B, which displays characteristics of all three phases outline in Phase Theory (Mann, *n.d.*, 2000*a*; 2003*b*; Sharpe, 2003). A wide range of instructional materials and educational resources are available to students in Course B, as are opportunities for collaboration, problem-solving, and the application of higher-order thinking skills. These elements appear to have been taken into careful consideration in an effort to maximize the ability of the course to meet the needs of students, and to capitalize on the experience and characteristics of the target learners.

Nature of Student Participation

The first method of analyzing the nature of student participation is through a comparison of samplings of student postings to discussion forums. Two discussion folders from each course were compared, showing a dramatic difference between the level and nature of discussion postings made by students in Courses A and B (ed2go, 2003*a*, 2003*b*; Mann, 2003*a*; MUN, 2003*a*, 2003*b*). In Course A, a total of 14 messages were posted by seven contributors. Eight of

these messages were social in nature according to the evaluation scheme outlined by Henri's Model (Mann, 2003a). Only five messages were interactive in nature—extending or furthering a topic, while no messages could be classed as cognitive or meta-cognitive. Meanwhile, a total of 190 messages were posted by 16 different contributors from Course B. 70 of these messages were social in nature, while 120 messages showed characteristics of one or more of the interactive, cognitive and meta-cognitive categories. The differences between the number and types of postings for each course are summarized in Table 3 below.

Table 3: Summary of Discussion Postings for Courses A and B

	Course A	Course B
Total # of Messages	14	190
Total # of Contributors	7	16
Social Messages	8	70
Interactive Messages	5	
Cognitive / Meta-Cognitive Messages	0	} 120

The nature of student participation was also examined through an analysis of the descriptions of course assignments and evaluation, and the methods of disseminating and submitting student assignments, as outline on each of the course's web sites (ed2go, 2002, 2003a, 2003b; Mann, 2003a; MUN, 2003a, 2003b; Sharpe, 2003). The assignments and evaluation for Course A consisted primarily of completing short-answer, online quizzes for each lesson. These quizzes were submitted online, with grades instantly returned to students. Meanwhile, for Course B, the assignments consisted of weekly discussion postings showing comprehension and synthesis of course topics, papers that demonstrated student ability to apply those concepts to new and novel situations, and presentations of group models that required high levels of student collaboration to comprehend, synthesize, and apply course concepts. These assignments were all submitted either through the course discussion forum, or internal course email. Evaluation for each assignment was conducted by the instructor, who returned grades and comments to students individually by email.

The nature of student participation appears to be quite different for the two web courses. Student participation in Course A shows little evidence of peer interaction, higher order thinking skills, or efforts to take full advantage of the benefits of access online communication tools and

educational resources (ed2go, 2002, 2003a, 2003b; Mann, 2003a). As noted, this is consistent with the first phase of Phase Theory, and with apparent decisions made by the web course designers and managers with respect to the delivery, environment, content, and learners involved (Mann, *n.d.*, 2000a, 2003b). It also appears to be consistent with the primary objectives that have been identified for Course A. However, efforts to take better advantage of the power of the communication tools and resources available to online students may have increased the benefits of the course to, and thus the achievement levels of isolated target learners who otherwise have minimal access to subject-matter related resources. Meanwhile, student participation in Course B shows evidence of high levels of student interaction, collaboration, and the application of higher order thinking skills to the achievement of learning objectives and problem-solving activities (Mann, 2003a; MUN, *n.d.*, 2000a, 2003a, 2003b; Sharpe, 2003). Student participation in this course shows that efforts have been made to maximize the benefits experienced from access to online communication and collaboration tools, and online learning resources. Again, this is consistent with multiple levels of Phase Theory. In addition, it is consistent with apparent decisions made by the web course designers and managers with respect to the delivery, environment, content, and the learners involved.

Comparisons of the Effectiveness of Web Course and Instructional Design Decisions to Identified Course Objectives and Learner Needs

It is possible to compare the results of the Phase Theory comparisons and D.E.C.L. component analyses to the identified course objectives and learner needs for Courses A and B. This comparison shows that the web course designers and managers were operating within different mindsets when making decisions about web course and instructional design strategies, and that these different mindsets served different purposes in each course context (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b; MUN, 2002, 2003a, 2003b; Sharpe, 2003).

The designers and managers of Course A operated predominantly in a mindset consistent with the first phase of Phase Theory—Lesson Enhancement (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b). This phase dominated decisions that were made with respect to the delivery, environment, content, and the target learners of the course. The decisions that were made for this web course were consistent with the identified objectives and target learner needs. They were also consistent with the most likely sets of learner characteristics (Blank & James,

1993; Derry, 1988; Pratt, 1997; Rothwell & Kazanas, 1998; Spoon, 1998). However, this mindset fails to take full advantage of the powerful communication and collaboration tools available in online teaching and learning scenarios, thus putting remotely located learners, who have limited access to educational resources related to Course A's subject matter, at somewhat of a disadvantage.

The designers and managers of Course B operated predominantly within Phases One and Two of Phase Theory—Lesson Enhancement and Online Resource-Based Teaching and Learning (Mann, *n.d.*, 2000*a*, 2003*b*; MUN, 2002, 2003*a*, 2003*b*; Sharpe, 2003). There is also evidence that these designers and managers made some web course and instructional design strategy decisions within a Phase Three mindset—Creation of Virtual Learning Environments. All three phases of Phase Theory played roles in decisions that were made with respect to the delivery, environment, content, and the target learners of the course. They were also consistent with the most likely sets of learner characteristics, and the decisions that were made appear to be based on an effort to capitalize upon the characteristics, capacities and prior educational experiences of target learners (Blank & James, 1993; Derry, 1988; Pratt, 1997; Rothwell & Kazanas, 1998; Spoon, 1998).

In both Course A and B, the operating mindsets of the web course designers and managers, and the decisions that they made with respect to delivery, environment, content, and target learners, appear to be consistent with identified course objectives and learner needs. However, there are dramatic differences between the operating mindsets associated with each web course. These mindsets appear to have led to appropriate decisions about web course and instructional design strategies, with the exception that the designers and managers of Course A failed to maximize the potential benefits of online learning for target learners, who could have benefited from increased interaction with their instructor and peers, and increased access to online learning resources.

Comparisons of the Effectiveness of Web Course and Instructional Design to Actual Implementation

It is possible to compare the results of the Phase Theory comparisons, D.E.C.L. analyses, and the analysis of the Nature of Student Participation, to the identified objectives, target audiences, and specific web course and instructional design strategy decisions for each course.

This can be done to determine the relative effectiveness of the actual implementations of web course and instructional design strategy decisions (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b; MUN, 2002, 2003a, 2003b; Sharpe, 2003).

In Course A, web course and instruction design strategy decisions were made in a Phase One operating mindset (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b). The intention of these decisions appears to have been to provide students with access to an online training opportunity, to distribute text and image based content, and to provide for student and instructor interaction and online assessment and evaluation. From the Phase Theory Comparisons and D.E.C.L. component analyses, it appears that the web course designers and managers made fairly appropriate decisions about design and instructional strategy (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b). Higher levels of Phase characteristic integration were not needed in order to deliver the concrete instructional content. However, the analysis of the Nature of Student Participation shows that there was little interaction between student and the instructor, and that the majority of the interaction that did take place was predominantly unrelated to the course content (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b). It is not possible to determine the actual effect that these conditions had on student achievement without data on that variable. However, it does appear that decisions related to the facilitation of online interaction and access to learning resources were fairly ineffectual for Course A.

In Course B, web course and instructional design strategy decisions displayed the characteristics of multiple phases as outlined in Phase Theory (Mann, *n.d.*, 2000a, 2003b; MUN, 2002, 2003a, 2003b; Sharpe, 2003). The intention of these decisions appears to have been to provide students with access to an online learning opportunity, to distribute multimedia learning resources, and to provide for high levels of student and instructor interaction, online assessment and evaluation. It appears that these decisions were made in an attempt to capitalize on the full potential of online teaching and learning situations, and to capitalize on the typical characteristics and capabilities of target learners (Blank & James, 1993; Derry, 1988; Pratt, 1997; Rothwell & Kazanas, 1998; Spoon, 1998). From the Phase Theory Comparisons and D.E.C.L. component analyses, it appears that the web course designers and managers made appropriate decisions about design and instructional strategy (Mann, *n.d.*, 2000a, 2003b; MUN, 2002, 2003a, 2003b; Sharpe, 2003). From the analysis of the Nature of Student Participation, it appears that the implementation of these decisions was also highly effective. Students demonstrated high levels

of interaction and collaboration, made extensive use of access to online learning resources in their efforts to accomplish learning objectives and problem-solving activities, and displayed extensive use of higher order thinking skills (Mann, 2003a; STEM~Net, 2003).

It appears from an examination of the data collected from Courses A and B that there are differences in both the appropriateness of the web course and instructional design decisions that were made by designers and managers, and in the effectiveness of these implementations. While both courses are effective at providing access to a distance education or training opportunity for target learners, indications from the Nature of Student Participation are that Course A fell short in the implementation of decisions to provide for student and instructor interaction and student access to online educational resources (ed2go, 2002, 2003a, 2003b; Mann, *n.d.*, 2000a, 2003b). In the case of Course B, indications from the Nature of Student Participation are that the implementation of web course and instructional design decisions were highly effective (Mann, *n.d.*, 2000a, 2003b; MUN, 2002, 2003a, 2003b; Sharpe, 2003). In this case, target learners were able to take full advantage of provisions for online communication and collaboration, and access to educational resources. In addition, it appears that the implementation of web course and instructional design decisions was effective at capitalizing on student characteristics and capabilities.

Conclusions

It is apparent from the results of data analyses that there are, indeed, differences between the purposes, objectives, and target learner audiences of web courses offered by private sector profession skill development institutions, and those offered by public sector academic development institutions. In addition, the results indicate that there are differences between the operating mindsets of web course designers and managers, and the natures, appropriateness, and effectiveness of web course and instructional design strategy decisions. This study demonstrates that the web course designers and managers for Course B, the public sector, graduate-level academic web course, operated within a wider range of mindset phases as described by Phase Theory. Overall, they also made more effective decisions in efforts to address such factors as delivery, environment, content, and learners. And they were more effective in their actual implementations of these decisions in their web course. However, this study has significant limitations, most notably with respect to sampling sizes and the absence of data on actual student

achievement levels (Bieger and Gerlach, 1996, pp. 77-85; Leedy and Ormrod, 2001, pp. 103-106, 174-210, 230-236). To gain a more valid and reliable picture of the differences between the design and management of private and public sector web courses, it would be advisable to conduct a more extensive study, with a consideration of a wider range of data sources and variables.

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Appendix A: Henri's Model (in Mann, 2003a)

<u>Dimension/Weighting</u>	<u>Definition</u>	<u>Indicator</u>
Participation (0.5)	A compilation of the number of messages or statements transmitted by one person or group.	<ul style="list-style-type: none"> - The number of messages. - The number of statements.
Social (0)	A statement or part of a statement not related to formal content or subject matter.	<ul style="list-style-type: none"> - A self-introduction. - A verbal report.
Interactive (1.0)	A chain of messages connecting and furthering a topic.	<ul style="list-style-type: none"> - "In response to..." - "As we said before..."
Cognitive (1.5)	A statement exhibiting knowledge and skills related to the learning process.	<ul style="list-style-type: none"> - Asking a new question. - Making a new inference. - Formulating a hypothesis.
Meta-Cognitive (1.5)	A statement related to general knowledge and showing awareness, self-control and self regulation of learning.	<ul style="list-style-type: none"> - "I understand that..." - "I wonder if..."

Appendix B: Sample Consent Form
(Mann, et. al., 2002)



Informed Consent

Must be returned by August 30, 2003

Please read this document carefully, and ask any questions you may have before agreeing to participate in the study.

Title of the Research:

“A Comparative Analysis of the Management of Private and Public Sector Web Course Management & Design”

Background Information:

The purpose of this study is to examine the effectiveness of the design and management of web courses offered by private sector professional trade development institutions and public sector academic institutions. The examination will be conducted along two major frameworks: D.E.C.L. and Phase Theory (Mann, *n.d.*, 2000a). The examination will look at how each course addresses the elements of Delivery, Environment, Content and Learner, and where the design, delivery and management of each course falls in respect to the Phase Theory taxonomy. The examination will attempt to illustrate the differences between course content, the needs of the learners, and the effectiveness of addressing each of the D.E.C.L. elements with respect to the nature of the contents and learner needs.

This study will entail an examination of data that will be gathered from selected web courses, including data on the needs, objectives and target learner audiences for each course, data on decisions regarding web course and instructional design strategies, and data on student participation in online discussion forums, online assignments and evaluations, and overall student achievement levels. Participating students will not be required to participate in any activities that are not already included in the design of the web courses for which they are currently enrolled.

Risks and Benefits of Being in the Study:

This study does not involve the manipulation of any aspects of online course participation for any of the participating students, instructors, web course designers or managers. Therefore, this

study poses minimal risk to participants. There are no expected direct benefits from participation, beyond the ability to contribute to a greater understanding of the complexities and effectiveness of decisions related to web course design and management.

Confidentiality:

All data from this study is both anonymous and confidential, and will be available only to the participant, the researcher and his assistants. Written records will be stored in a locked cabinet accessible only by the researcher and his assistants. Digital records will be stored in a secured computer, with password access available only to the researcher and his assistants. Any tapes made during the course of the study will be erased once the study has been completed

Voluntary Nature of the Study:

Participation in this study is voluntary, and will have no bearing on participants' academic records. Your school is aware that you may decline to participate, and that you may withdraw from participation at any time. Withdrawing from the study will not affect any relationships between you and your school, the researchers, or Memorial University of Newfoundland. You will be given a copy of this form to keep for your records.

Ethical Considerations:

This research meets all ethical guidelines set out by Memorial University of Newfoundland, and has the written ethics approval of the University's Ethics Committee.

Contacts and Questions:

The principal investigator for this research is Mr. Rob Power from the Faculty of Education, Memorial University of Newfoundland. Mr. Power is a graduate student with the faculty, currently completing the Master of Education (Information Technology) program. Mr. Power will have one or more other graduate students and research assistants from the Faculty of Education working with him. If you have any questions, you may contact:

Rob Power
10-A MacCarthy Crescent
Mount Pearl, NL, CANADA
A1N 3R9
Email: robpower@hotmail.com

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in this study.

Participant's Name (please print): _____

School: _____ Course: _____

Student's Signature: _____ Date: _____

Signature of Investigator or Person Obtaining Consent:

_____ Date: _____

Rob Power
10-A MacCarthy Crescent
Mount Pearl, NL, CANADA
A1N 3R9
Email: robpower@hotmail.com