

Traditional Classroom-Based Defensive Driving and Online Defensive Driving –A Comparative Study

A Comparison of Participant Outcomes between Traditional Classroom-Based Defensive Driving and Online Defensive Driving

Dr. Randy Flemmer
Fleet Safety International Corp.
rflommer@fleetsafetyinternational.com

Introduction

Distance learning is not new. Some of the first distance delivery programs were initialized through the postal service in the 19th century. Commercial correspondence programs provided the initial foundation for distance delivery of educational programs. In the last decade, distance education has changed dramatically through the advancement of technologies that make programs more flexible and accessible than their classroom-based equivalents.

Defensive driving programs are no exception. Over the last 3 or 4 years, numerous online defensive driving programs have been initiated across North America. To compete with the trend towards online defensive driving Fleet Safety International Corp. (FSI) developed an online version of its classroom-based 6 hour program. This pilot study documents a comparative evaluation of participant outcomes between these two programs.

Review of Current Literature

While the concept of distance learning is not new, the delivery of such programs through the World Wide Web, over the Internet is less than a decade old. In this short time, online internet-based programs have grown to become an accepted means of education. Statistics Canada reports that enrolment in adult distance education courses grew 30 percent more than traditional classroom-based courses between 1991 and 1993 ([Bernier, 1996](#)). A Workplace Trends survey predicts that 50 percent of all adults enrolled in an educational institution will never enter a classroom in the years to come ([Boyett, 1996](#)). Robert Tucker, who heads an Arizona-based higher education research firm called InterEd, estimates that 55% of the U.S.' 2,215 four-year colleges and universities have courses available off-site, and over 1 million students are now plugged into the virtual college classroom, which compares with 13 million attending brick-and-mortar schools. Tucker's research firm predicts that the numbers of cyberstudents will more than triple by the turn of the century.

Online programs are becoming popular through society's call for lifelong learning, employment and the need to juggle family responsibilities. Traditional classroom-based programs simply do not meet these needs (Parker, 1999). A White Paper recently written for Nortel Networks analyzed several industry studies to find the potential benefits of distance learning (Nortel Networks, 1999). These benefits include:

- Reduced learning time – As much as 30 – 40 % less as compared to classroom instruction.
- On-demand learning – Instruction is available when and where the learner needs it.
- Increased motivation – Students frequently report that they find technology-based interactive learning more interesting and enjoyable than classroom lectures.
- Increased achievement – When corrective feedback or a learning strategy is employed, students often show better test results, retention, or job performance from the technology-based learning.
- Better quality control – Learning experiences are delivered the same way each time it is delivered; there is more consistency than classroom-based programs.
- Increased safety - Students can learn about dangerous procedures with out being at risk.
- Greater flexibility – Fluctuations in the number of learners, or backgrounds can be accommodated more easily than classroom-based programs.
- Improved accountability – Automatic collection of data on learner performance can verify that learning has been accomplished.
- Faster revision – Learning experiences are delivered via a networked system, simplify the process of making changes.
- Reduced delivery costs – Once the program is developed, technology-based interactive learning is likely to cost less when compared to labor-intensive classroom learning.
- Learner controlled – Each learner is able to review topics as often as needed.

Effectiveness of Distance Learning

Thomas Russell (1999), director emeritus of instructional telecommunications at North Carolina State University reviewed over 400 distance education studies and found that most studies showed that there were no significant difference in effectiveness of learning between methods that employ distance education methodologies and traditional classroom-based models.

Since the release of his 1999 book, "The No Significant Difference Phenomenon" Russell has developed and maintained a web site at:

<http://www.nosignificantdifference.org/nosignificantdifference/>.

The primary purpose of this site is to provide access to appropriate studies published/discovered after release of the book. In addition to posting post-book entries on this NSD site, a companion site features comparative studies which DO document significant differences at:

<http://www.nosignificantdifference.org/significantdifference>

A review of these sites shows that while the last entries were posted in 2002, there is a multitude of studies both showing significant difference and no significant difference between online learning and traditional classroom instruction.

Additional literature favors the effectiveness of online learning as an instructional delivery method. "Well-designed distance education programs are equally effective in terms of learner

outcomes with resident instruction, in general, and produce superior learning outcomes in specific applications" (Kelly, 1993, p. 76). Ronald Phipps and Jamie Merisotis who prepared a report called "What's the Difference" for the Institute of Higher Education Policy, the American Federation of Teachers and The National Education Association provide opposing views to the above analysis. The authors of the report question the quality of current distance learning research indicating that much of the research should be rendered inconclusive due to poor methodology. However it should be noted that Phipps and Merisotis' report was found to be contradictory and convoluted by Gary Brown and Mary Wack (1999) in their article "The Difference Frenzy and Matching Buckshot with Buckshot". Brown and Wack also question the objectivity of the report because its release coincided with a planned ad campaign to ridicule distance learning.

Perhaps the most prolific arguments against online and distance learning "No Significant Difference" studies come from Richard Clark's (1994) statement cautioning educational researchers to "give up your enthusiasm for the belief that media attributes cause learning", he has convinced many researchers in the field that most if not all of "No Significant Difference" studies were in some way flawed. Clark stated that, "there are no benefits to be gained from employing different media in instruction"(Richard Clark, 1983, p. 450). Based on Clark's thinking, it would seem that the reports contained in Russell's "No Significant Difference Phenomenon" website have focused primarily on differences in the media rather than the methods employed *via* the medium.

Thomas Ramage (2002) responded to Clark based criticism by reflecting on the difficulty of studying the effectiveness of traditional learning itself:

Consider learning styles, multiple intelligences, socio-economic factors influencing learning and cognition, student preferences, faculty teaching style, active-learning techniques, constructivism vs. behaviorism vs. instructivist methods, air temperature, room size, time of day, and daily caloric intake. Every one of these variables has been studied to some extent and when assessed individually, some generalizations can be made, but always with exception and never with absolute certainty. Why should the study of distance education or the effects of technology on learning be held to a higher standard? It is difficult, if not impossible, to apply scientific methods to social science hypothesis. Human cognition has, to date, provided no quantifiable absolutes or baseline from which research can benchmark. At the moment, the best that can be done is to try - by constructing studies and research that address both sides of the efficiency question.

In a summarizing his review, Ramage (2002) reflects on the volumes of research both pro and against, and asks: Does technology impact learning? Ramage concludes that he found no study, no evidence of any kind that categorically proves that technology *does not* impact learning in some way, positively or negatively.

Purpose

The purpose of this exploratory empirical study was to compare the online defensive driving program designed by FSI to the existing classroom-based defensive driving program. To this end we compared final examination student performance.

Government Role

The Alberta Government through its Transportation Safety Services Division was asked and granted, temporary accreditation to provide a 3-demerit reduction to successful FSI online defensive driving program graduates.

Methodology

Course Format Description

All accredited defensive driving programs in Alberta are required to abide by the following provincially approved guidelines:

Minimum Course Standards

- Minimum classroom instructional time of 6 hours, of which not less than 4.5 hours shall be in a form which allows student participation and discussion.
- A maximum of 1.5 hours may be used in showing videos or films, which illustrate course content.
- Completion of a knowledge examination of 40 questions, with a test score of not less than 80%
- There must be two knowledge examinations available, each test consisting of different questions of which:
 - At least 30 questions are multiple choice with a selection of 4 possible answers;
 - 15 questions based on information found in the Alberta Basic Drivers Handbook, and
 - 25 questions, which are based on other course content.
 - Time allocated for the knowledge test, and any break period, is not included within the minimum 6 hour instructional time.

Minimum Standards for Course Instructors

- Holds a valid Alberta operator's licence other than a Class 6 or 7; And
 - Has received defensive driving / professional driver improvement instructor training from any agency authorized by Alberta Infrastructure and Transportation, Driver Safety Programs, to conduct such training; OR

- Holds a valid Alberta driver instructor's licence; AND
 - Has at least 1,000 hours of in-vehicle driver instruction or 100 hours of classroom instruction in an approved driver education course during the two year period preceding the commencement of defensive driving course / professional driver improvement instruction; AND
 - Is recommended by the Senior Instructor and has conducted at least two full courses under the supervision of an experienced defensive driving / professional driver improvement course instructor.

Course Content

- Defensive Driving
- Traffic Laws
- Vision Habits
- Driving Conditions
- Vehicle Control
- Collisions
- The Driver

Both the classroom-based and the online defensive driving programs that were used in this study followed the outlined guidelines, and were reviewed and approved by a provincial representative.

Technology

Software

The software for the FSI online defensive driving program was custom designed and developed for this application. Software capabilities include:

- 3 levels of participant identification tests: Agreement Statement, Section Agreements and Randomized Questions
- 3 levels of interactivity integrated into the program: bulletin board, real time text-based chat sessions that can be upgraded to audio and video,
- Each section has capabilities of text, audio and visual components
- 6 Hour Timed, Certified and Monitored Programming
- Full streaming video with review question capability and low bandwidth options available
- Randomized section tests and randomized 40 – 50 question final test.
- Built-in password protections
- Full reporting function with back door console availability.

Hardware

- Dedicated Server
- Full back up protection
- Protection against power outages
- Computer is in a specially designed server room with high security and protections
- Security procedures against viruses and hackers
- Network Administrators on duty 24 hours - 7 Days a week
- Server and Server room is available for viewing upon request
- Planned load dependant server acquisition plan

Sample

The sample consisted of individuals from the general public located primarily in Calgary, Alberta. While there was no specific survey as to the reason these individuals were taking the program, most people take the program to remove three demerits from their license. There were 240 participants with 120 taking the classroom-based program and 120 taking the online program.

Instrument

The instrument used in the study consisted of a 40 question multiple-choice exam using questions selected by the researcher and approved by the provincial representatives. Both study groups received identical exams making a direct comparison of the average of the exam scores possible. The classroom examination was a proctored, closed book test monitored by the instructor. The online examination was an electronically administered test that does not allow the participant to go back and review program content during the test.

Pass mark for both the classroom-based program and the online program were set at the provincial standard of 80%. In case of a fail mark, both programs allowed for further review and a re-test of the material. The online program has software that is capable of randomizing test questions from a test bank. However to keep the questions identical between both the online program and the classroom-based program, this feature was turned off for the duration of the study.

Randomization Methodology

A Randomized Matched Subjects, Posttest-Only Control Group Design was utilized in this study.

Matching Subjects

Subjects were initially identified under three central criteria:

1. The subject has a need or a want to take a defensive driving program
2. The subject is willing to be part of this research study
3. The subject has or has access to an appropriate computer system and internet connection

Those students who matched all the above criteria were then given a brief questionnaire that assisted us in creating matched groupings. This questionnaire was provided orally over the phone, through Internet form and by paper-based methodology. Through a review of the questionnaire, subjects were placed into one of two matching groups.

Randomization

Once a subject is placed into one of the matching groups, a coin was flipped to see if the participant would take the online version of the defensive driving program or the traditional classroom-based version.

Results

Student performance was evaluated by comparing exam scores between the two programs using duplicate exams, and as an aggregate using overall exam averages. The goal was to determine if there were significant differences in student performance between programs. A direct comparison of exam scores between the classroom-based program and the online program was undertaken. As is evident from examining Table 1, there is little difference between average exam scores. Statistical analysis using t-tests indicates that there is no significant difference between the exam scores.

Table 1: Average Exam Scores

	Classroom Based Program	Online Program
Matched Group 1	87.23%	87.28%
Matched Group 2	87.19%	86.58%

Although exam results are but one out of several criteria normally used in evaluating student performance, in this situation they serve as a readily available measure. It appears from the data collected, that there was no significant difference in student performance, regardless of the class format. This is an encouraging result, and bodes well for the future of online defensive driving programs.

Limitations

As with any study there are situational and methodological limitations to be considered. Methodologically, this was a pilot study. Thus, any generalizations are left to the discretion of the reader. Other limitations that should be considered are the following:

- Since the online defensive driving program was being offered for the first time, anomalies were discovered and subsequent course fine-tuning occurred as the study progressed. As these changes were mostly grammatical and technical in nature, it is felt that these changes had a minimal impact on the results of this pilot study.
- While effort has been taken to ensure that content and videos for both the classroom program and the online program are matched, it is difficult to account for differences in teacher delivery. Four different classroom instructors were utilized over the duration of the study. Each instructor was informed on the importance of following the curriculum and each instructor completed the online version of the program to ensure familiarity with the material. All four utilized instructors were seasoned, experienced and Alberta certified Defensive Driving Instructors. However, while the online program had a consistent delivery, individual differences in classroom instructional delivery and style were impossible to control.

Conclusions and Implications

As documented above, this was a learning experience. From an instructional perspective, it was at times frustrating trying to match classroom and online learning. In the end though, it was a useful experience that revealed several problem areas and lay to rest some fears. There were some problems with the course delivery platform and web materials that were addressed as issues arose, however, overall student performance did not suffer.

Study results appear to be consistent with most other comparative studies showing no significant difference in student performance between classroom-based learning and online learning. From an instructional perspective, this means that other online programs that follow provincial guidelines and match the technological requirements of this study can be offered with little concern over how well students will do in comparison with courses taught conventionally.

Based on this study, the following recommendations should be considered for online programs being considered for provincial accreditation:

- Online defensive driving programs should be clearly designated and advertised as such to prevent student confusion at the time of enrolment.
- Course delivery platforms need to provide stable and consistent delivery of their content.
- Clear and specific specifications for the student's computer hardware, software, and telecommunications must be published prior to course registration so that enrolling students can be ready to participate in the online program.
- Online program should at a minimum, be able to pass the given technology requirements provided in this study.

- A final area that may be out of hands of students and instructors is rapid and consistent access to the Internet. Although high speed Internet access is becoming available in urban areas, it will take some time before it becomes widespread on a provincial basis. Until such time, online programs will need to offer low speed alternatives such as the low bandwidth video option that was available in the study program.

In summary, online defensive driving when properly set up, delivered and monitored can be equally effective in terms of student performance as compared to traditional classroom delivery models.

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