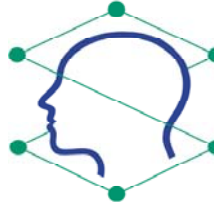


West GTA Stroke Network



CONVERTING STROKE BEST PRACTICES NURSING EDUCATION INTO A PROVINCE WIDE TELE-EDUCATION MODULE

Evaluation Report

June 2006

**Submitted by the West GTA Stroke Network
Laurentian University School of Nursing
NORTH Network, A Partner in Ontario Telehealth Network**



PARTNERS IN THE ONTARIO TELEHEALTH NETWORK

Acknowledgments

Converting Stroke Best Practices Nursing Education Into a Province Wide Tele-education Module was a collaborative project involving the support, participation, and hard work of many individuals. Special appreciation is extended to the following people:

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Table of Contents

Abstract.....	4
Executive Summary.....	5
Introduction.....	8
Literature Review.....	8
Study Objectives	10
Methods.....	11
Findings.....	11
Discussion.....	26
Conclusions and Recommendations	26
References	28
Appendices	30

Abstract

The Ontario Stroke System has recognized education as a key pillar in bringing new medical and scientific evidence forward to support best practices in stroke care across the province. Given this, the West GTA (Greater Toronto Area) Stroke Network and Trillium Health Centre, in collaboration with regional and provincial partners, are committed to ensuring that knowledge transfer regarding stroke is promoted through a number of world-class training initiatives which they have developed and pioneered and are now able to share through innovation and technology. The result of this work has meant increasing access for nurses to a stroke best practices education module.

The scope of this project, funded by the Ontario Ministry of Health and LTC, was to develop, produce, pilot and evaluate a technology-enabled stroke education program targeted for nurses through a partnership between the West GTA Stroke Network, Laurentian's University School of Nursing and NORTH Network, a partner in the Ontario Telehealth Network. The nurses who took part in the project lived principally in northern Ontario.

The technologies used to deliver the educational experience included videoconferencing, web-casting, and a web-based learning site constructed using a Web Course Tools (WebCT) management system. The research goals of the project included evaluation of the impact of the educational modalities on nurse-learners' knowledge exchange, self-efficacy, and critical thinking as well as identification of the human and technology supports required to sustain learning with the new modalities.

A mixed methods research design was used to evaluate the project. In total, 96 nurses from northern Ontario participated in the educational experience. In the research part of the project, 46 participants completed the pre-pilot research questionnaire while 30 completed both the pre- and post-questionnaires. On-line bulletin board postings based on three learning activities were analyzed using Johns (1995) as a framework to categorize critical thinking. Two post-course focus groups were conducted to understand how the content and delivery mode of the course affected critical thinking skills.

Improvement and satisfaction were seen in all areas. High levels of satisfaction were expressed by the participants regarding both the content and the mode of delivery. Self-efficacy (self-confidence) and critical thinking were enhanced as evidenced by the on-line bulletin board postings and focus group data. The words of one focus group participant aptly reflect the views expressed by the majority of project participants: "I thought the course was really great and one thing I thought about was there would be no way we'd get this many northerners to one course except for this way (using technology), so way to go!" Furthermore, the design of the experience as it included videoconferencing, web-casting, and a Web CT-based learning site supported different learning styles such as visual and auditory learning as well as interactive experiences with both "instant and delayed" feedback. Such technological interplay enhanced reflection and self-efficacy as these concepts are described in the literature.

Executive Summary

This Ministry of Health and Long-Term Care funded project involving the West GTA (Greater Toronto Area) Stroke Network, Laurentian University School of Nursing, and NORTH Network developed, produced, piloted, and evaluated a technology-enabled stroke education program for nurses living principally in northern Ontario. The technologies used to deliver the educational experience included videoconferencing, web casting, and a web-based learning site constructed using a Web Course Tools (Web CT) management system. The research goals of the project included evaluation of the impact of the educational modalities on nurse-learners' knowledge exchange, self-efficacy, and critical thinking as well as identification of the human and technology supports required to sustain learning with the new modalities. In this report, a brief literature review, research objectives, methods, findings, discussion, conclusions, and recommendations are presented. Appendices are attached to illustrate and support various components of the project. One objective initially identified in the proposal was the development of the program as a university level course. This objective was deferred due to time restrictions as the pilot focused on offering three educational modules from the complete project. Further development of the course to address the requirements as a university level course was recommended for future consideration.

The project was a direct response to the demand and need for education to assist nurses and other healthcare professionals working in rural, northern and, in some cases, isolated areas of the province of Ontario. As the literature suggests, technology-enabled courses can provide nurses access to the latest knowledge/information for patient care. This is extremely important especially when access to such knowledge can be limited, non-existent, or difficult to acquire. At the same time, the question of which delivery methods are most effective given specialized content is an area requiring further study. In addition, the project hoped to provide evidence that this type of educational opportunity was both cost effective in terms of providing education to nurses practicing in the north, and an effective method of increasing transferable knowledge across a wider area of the province.

In Ontario, more than ever before, nurses are seeking continuing education in specialty areas such as stroke care through technology-enabled distance education. While, historically, nurses have been seen as reluctant users of computers and other technologies (Gibson & Rose, 1986), this situation changed dramatically in the late 1990s, making the combination of technology and nursing education a powerful one. A distinctly important outcome of this phenomenon is enhanced skill with technology among nurses. This is significant as more and more nurses are required to use the computer and other technologies in their daily clinical practice (Bachmann & Panzarine, 1998; Billing, 1999).

In this study, a mixed methods research design that utilized quantitative and qualitative data collection processes was used to evaluate the learning experience. In total, 96 nurses from northern Ontario participated in the educational experience; 46 completed the pre-pilot research questionnaire; 30 completed both the pre- and post-questionnaires. On-line bulletin board postings for three learning activities were analyzed for critical thinking using Johns (1995). Two

post-course focus groups were conducted to clarify whether or not as well as how the course contributed to participants' critical thinking skills about stroke care.

Findings

The overall evaluation of the course by participants was extremely positive. Many learners requested additional opportunities for similar educational experiences. There was strong interest expressed in acquiring and applying the latest evidence-based knowledge in order to provide optimum patient care. The learning sessions and tools were accessed without the need for travel, or replacement costs for staff, making the program accessible to more participants from each facility than would have been possible in a more traditional type of program.

Demographics

The mean age of this predominantly female participant group (98%) was 43 with a range of 26 to 58 years. In line with the intent of this pilot, the respondents were mainly from northwestern (57%) and northeastern (37%) Ontario - with limited representation from the West Greater Toronto Area (GTA) Stroke Region (4%) and the Central East Stroke Region (2%). The majority of the participants were working full-time ($n=29$, 63%) while 33% ($n=15$) were part-time and 4% ($n=2$) were casual. As Registered Nurses (75%) and Registered Practical Nurses (25%), they were working in a wide range of areas including acute and long-term care. Mean years of practice as a nurse was 17 with a minimum of 0.5 and a maximum of 35 years: 13% had 22 years of practice as a nurse while 13% had 25 years of practice as a nurse. The mean years of practice in stroke care was 8.8 with a range of 0 to 30 years.

Learning Experience Findings

Participants attended videoconferencing sessions, viewed web-casts, and completed on-line quizzes and learning activities. There were improvements in all areas with a few exceptions and a number of suggestions were offered for improving the delivery of the course. In particular, recommendations were made regarding the on-line learning site and interaction. The content was regarded to be excellent although some participants found the quantity of content to be heavy and would have preferred the content to be spread over four sessions rather than three.

In all, the consensus was that the blended nature of this learning experience as it included different technologies was regarded to be highly appropriate for working nurses. The combination of three educational technologies supported different learning styles and reflected sensitivity to the needs of nurses working and learning in smaller organizations. The experience as a whole also supported nurses' growth as critical thinkers and their sense of self-efficacy working with stroke patients. There were also positive gains in the area of stroke knowledge.

Conclusions and Recommendations

The project was highly successful with interest expressed by 96 individuals to take the course despite

a very short time frame between advertising and delivering the course. In a period of less than a month, the course's availability as a pilot was advertised through the work of the Regional Stroke Program Managers and the Regional Stroke Education Coordinator. The 96 nurses who enrolled in the course attended videoconferences, viewed web-casts, and completed online quizzes and learning activities. There were improvements in all areas with a few exceptions and some minor changes to various aspects of the delivery were suggested: some recommendations were made regarding the design of the learning site while some participants expressed a desire for even more interaction during the videoconferences and on line. While all participants felt the content was excellent, some found the quantity of content somewhat daunting and would have preferred that the content be spread over four sessions rather than three.

The recommendations that emerge from this report are based on the overwhelming need for accessible continuing education opportunities especially for all nurses with particular emphasis on nurses working in rural, northern, and isolated areas. Recommendations include the following:

- More of these learning opportunities made available on an ongoing basis
- A needs assessment to determine future topics and how often they should be delivered
- An environmental scan to determine funding sources, topics, potential partners, and so forth
- Establishment of partnerships between experts in practice, acute and long term care facilities, NORTH Network, educators, and organizations such as Heart and Stroke, the Cancer Society, and other health education stakeholders
- Long term evaluation of knowledge translation into practice

Introduction

This Ministry of Health and Long-Term Care funded project involving the West Greater Toronto Area (GTA) Stroke Network, Laurentian University's School of Nursing, and NORTH Network, a partner in the Ontario Telehealth Network, developed, produced, piloted, and evaluated a technology-enabled stroke education program for nurses living principally in northern Ontario. The technologies used to deliver the educational experiences included videoconferencing, web-casting, and a web-based learning site constructed using a Web Course Tools (Web CT) management system. The research goals of the project included evaluation of the impact of the educational modalities on nurse-learners' knowledge exchange, self-efficacy, and critical thinking as well as identification of the human and technology supports required to sustain learning with the new modalities. In this report, a brief literature review, study objectives, methods, findings, discussion, conclusions and recommendations are presented. Appendices are attached to illustrate and support various components of the project.

Literature Review

More than ever before, Ontario nurses are seeking continuing education in specialty areas such as stroke care through technology-enabled distance education. While, historically, nurses have been seen as reluctant users of computers and other technologies (Gibson & Rose, 1986), this situation changed dramatically in the late 1990s, making the combination of technology and nursing education a powerful one. A distinctly important outcome of this phenomenon is enhanced skill with technology among nurses. This is significant as more and more nurses are required to use the computer and other technologies in their daily clinical practice (Bachmann & Panzarine, 1998; Billing, 1999). Other learning-based outcomes of continuing education when it is offered through the flexibility of technology are as follows:

- engagement with high quality learning materials and activities; examples include notes and resources prepared by a nursing content expert, course- and discipline-specific graphics, sound and audio clips, instructor-selected web links, interactive demos, simulations, and so forth (Bonk & King, 1998; Harasim, Hiltz, Tele & Turoff, 1996)
- different kinds and levels of interaction through synchronous and asynchronous means among students; between the instructor and an individual student; between a member of the support staff and the individual student (Carter & Rukholm, 2002; Billings, 1999; Bonk & King, 1998; Harasim et al., 1996; Cragg, 1994a & 1994b)
- experiential learning facilitated by multimedia-based resources including clinical databases and simulations reflecting real-world practice (Billing, 1999)
- opportunities for self-assessment as well as formative and summative assessment
- opportunities to participate in high-level scholarly discourse (Carter & Rukholm, 2002) and critical thinking (Carter, Rukholm, Mossey, Viverais-Dresler, Bakker & Sheehan, 2006)

In the nursing literature, critical thinking has been linked to the clinical reasoning skills that nurses use every day (Kluge, 2004; Kennison & Misselwitz, 2002; Daroszewski, Kinser, & Lloyd, 2004; Kessler & Lund, 2004; Hannigan, 2001). This noted, a number of different understandings of critical thinking exist. The understanding espoused by the American

Philosophical Association (APA) and the position that critical thinking is reflective thinking (Brookfield, 1987; Mezirow, 1981, 1990; Glaser & Watson, 1980) was used in this study.

Regarding the former view of critical thinking, in 1987 through a Delphi project involving a group of American and Canadian scholars, the American Philosophical Association (APA) brought together 36 cross-disciplinary theoreticians to develop a conceptual definition of the ideal critical thinker. Based on the project's results, the ideal critical thinker is said to be inquisitive, informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (Facione, Facione, & Gainen, 2000).

By comparison, when critical thinking is described as including reflection, the critical thinker is said to be one who possesses the ability to handle change; to rethink habits; to participate in self-examination of behaviours and ways of thinking; to create alternatives; to think things through; to do strategic planning and goal setting; to demonstrate specific intellectual and personal traits; and to reflect on the consequences of decisions (Brookfield, 1987; Merriam & Caffarella, 1999; Paul, 1993).

In addition to the distinctions noted above regarding a definition of critical thinking, there are further distinctions made between what are called critical thinking skills and critical thinking dispositions—sometimes referred to as habits of mind (Rubenfeld & Sheffer, 2000). Critical thinking skills pertain to thinking applications while dispositions refer to character tendencies to think and act critically. In this project, the nurse-participants' critical thinking skills as demonstrated in written work based on learning activities and critical thinking dispositions as based on distinct character attributes as suggested by Facione, Facione, and Gainen (1995) were explored. According to Facione, Facione, and Gainen (1995), a person's critical thinking dispositions include truth seeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and maturity in judgment.

According to Johns (Johns, 1995) and other nursing experts, nurturing nurses' critical thinking through reflection has several important benefits: of primary importance is that it assists nurses in delivering care that considers the health needs of the whole person. This is in line with the shift that has occurred in nursing as it has moved from a more medically based to a more holistically based model (Johns, 1995). In practical terms, this shift has required nurses to think more critically about their nursing care plans, attitudes, and actions so that they are, to the best of their abilities, responding to the needs of the patient. Johns (1995) also points out that it is shortsighted to think that nurses will be able to teach themselves this skill within the fast-paced context of contemporary health care. Powell (1989) similarly emphasizes that nursing education experiences must encourage nurses to become proficient thinkers, and that nurses cannot be realistically expected to learn new and complex ways of thinking on their own without formal instruction and opportunities to practise these ways of thinking in safe settings.

As a way of identifying the different kinds of thinking that nurses do in practice, Johns' Model of Structured Reflection (1995) based on Carper's (1978) model of nursing education called Fundamental Ways of Knowing to Frame Learning through Reflection is a valuable tool.

According to Johns (1995), there are four main ways of knowing—aesthetic, personal, ethical, and empirical—and each is a part of nursing practice.

Aesthetic knowing involves challenges to the self as well as reflecting on what the person is trying to achieve and why she or he responded in a particular way. This kind of thinking also tends to focus on the feelings of others and the experience of consequence. Aesthetic thinking may include statements dealing with consequence and awareness of how the other person is feeling. This is reflected by statements such as *“These symptoms, although not causing any immediate distress to Mr. B, have caused him enough concern to talk about them at this annual assessment which leads me to believe that he is worried.”* Although similar to aesthetic knowing with a focus on feeling, personal knowing is almost always about the self and is frequently an attempt to answer questions such as *“How did I feel in this situation?”* and *“What internal factors influenced my behaviour?”*

Ethical knowing deals with the issue of congruence between a nurse’s actions as a professional and his or her personal value system. It is about wrestling with questions such as *“How did my actions match with my beliefs?”* and *“What factors made me act in ways that do not fit with my values?”* This kind of thinking focuses on the nurse’s personal values and practices as well as the ethical rights of another person within the context of a professional relationship. Finally, in a situation of empirical knowing, the nurse considers how nursing knowledge informed (or should have informed) practice.

In summary, this literature review has demonstrated that:

- technology-based education including videoconferencing, web casting, and online web applications is a popular option among Ontario nurses seeking continuing professional development opportunities
- critical thinking is an important element in nursing practice and is studied largely from two perspectives: dispositions and skills
- critical thinking is an important learning outcome of nursing curricula across North America
- reflection is a tool that may foster critical thinking

Assuming that technology-based nursing education has taken an important place in the dissemination of clinically-based content for nurses, it follows that educators and researchers need to know more about nurses’ experience of education through technology and technology’s capability for supporting critical thinking. This project addressed this gap.

Study Objectives

Among other things, the initial objective of the proposal was to create a university level accredited course in partnership with Laurentian University School of Nursing. Due to the shortened timeline of the project, the objectives were modified. The revised objectives of the project were two-fold. They are listed below:

1. To evaluate the impact of technology-based educational modalities on nurse-learners’ knowledge exchange, self-efficacy, and critical thinking

2. To identify the human and technology supports required to sustain learning with the new modalities

Methods

A pre- and post-mixed methods design was used. Questionnaire, threaded asynchronous, bulletin board, and focus group data were used to evaluate knowledge exchange, self-efficacy, critical thinking, and satisfaction with the content, the learning technologies, and overall learning experience. The pre- and post-questionnaires were completed by participants prior to and following course delivery. The focus groups were conducted at the conclusion of the course after questionnaire data had been analyzed. The data derived from the bulletin board work were also analyzed after completion of the course. Age, gender, years of work experience, employment status (full time, part time, casual), work setting (medical surgical unit, ICU, etc), and other relevant demographic data were collected.

A purposive sample was utilized. All individuals enrolled in the course were invited to participate. It was anticipated that the sample size would include approximately 20 to 30 nurses. In the winter-spring of 2006, the study was conducted over a three-month period following receipt of ethical approval from Laurentian University's Ethics Review Board as well as each of the workplaces of the participating nurses.

Findings

The questionnaire data were analyzed using the Statistical Package for Social Science (SPSS). Descriptive statistics were used to analyze the survey data. Pre- and post-academic quiz data were also analyzed.

A constant comparison approach was used to analyze all qualitative data (bulletin board postings and focus group interviews). Bulletin board postings from the on-line aspect of the course were analyzed for types of critical thinking using Johns (1995) as a framework to code the data. Final synthesis of data included illustrative comments (Creswell, 1998; Morse & Field, 1996). Rigor of the analytic processes for the qualitative data analysis was enhanced by independent reading of the data coding by two investigators. Discussion by the researchers continued until consensus was achieved; at times, this required that the researchers return to the original data.

Questionnaire, academic quiz, bulletin board, and focus group data analysis are presented below.

Questionnaire Data Analysis

Demographics

The mean age of this predominantly female participant group (98%) was 43 with a range of 26 to 58 years. In line with the intent of this pilot, the respondents were mainly from northwestern (57%) and northeastern (37%) Ontario, limited representation from the West Greater Toronto

Area (GTA) Stroke Region (4%) and the Central East Stroke Region (2%). The majority of the participants were working full time ($n=29$, 63%) while 33% ($n=15$) were part-time and 4% ($n=2$) were casual. Both Registered Nurses (75%) and Registered Practical Nurses (25%) worked in a wide range of areas including acute and long-term care. Mean years of practice as a nurse was 17 with a minimum of 0.5 and a maximum of 35 years: 13% had 22 years of practice as a nurse and 13% had 25 years of practice as a nurse. The mean years of practice in stroke care was 8.8 with a range of 0 to 30 years.

Pre-Pilot Questionnaire Data Analysis

The analysis for each pre-pilot question is presented below. Questions focused on three main areas: skill in use of technology, satisfaction with technology, and confidence/self-efficacy in assessing, problem solving, and communicating information about stroke.

Regarding past education experiences in stroke care and computer/technology skills, 54% of participants ($n=25$) had NOT previously taken a workshop/course in stroke care while 70% ($n=32$) had NOT previously taken a workshop/course in best practices related to stroke care. The majority of participants ($n=18$, 45%) had never taken a technology-enabled course in the past; however, 13% ($n=5$) were technologically-sophisticated learners having taken three or more technology-enabled courses. Table 1 illustrates the participants' past experience with various components of technology-enabled courses.

Table 1. Components included in past technology-enabled courses ($n = 46$)

Component	Yes	No
use of computer	63% (29)	37% (17)
use of internet	48% (22)	52% (24)
Keyboarding	37% (17)	63% (29)
Writing	24% (11)	76% (35)
Videoconferencing	17% (8)	83% (38)
Webcasting	7% (3)	93% (43)
internet discussion boards	13% (6)	86% (40)

Table 2 shows the participants' satisfaction with a number of components that are typically found in technology-enabled courses. Participants' ratings were based on courses they had taken previously.

Table 2. Satisfaction with components typically found in technology-enabled courses ($n = 46$; n/a = not applicable)

Component	low sat.	somewhat low sat.	average sat.	Somewhat high sat.	high sat.
use of computer (n/a =17)		4% (1)	16% (4)	48% (12)	32% (8)
use of internet	4% (1)	4% (1)	17% (4)	21% (5)	54% (13)

(n/a = 18)					
keyboarding (n/a = 20)		4% (1)	18% (4)	32% (7)	45% (10)
writing (n/a = 20)		4%(1)	27% (6)	27% (6)	41% (9)
Videoconferencing (n/a = 25)		6% (1)	18% (3)	29% (5)	47% (8)
Webcasting (n/a = 30)	8% (1)	8% (1)	8% (1)	50% (6)	25% (3)
internet discussion boards (n/a = 25)		6% (1)	12% (2)	35% (6)	47% (8)

Table 3 illustrates participants' ratings for present competence in using technology for course work.

Table 3. Competence in using technology ($n = 46$)

Component	low comp.	somewhat low comp.	average competence	somewhat high comp.	high comp.
use of computer ($n = 45$)	4% (2)	20% (9)	29% (13)	20% (9)	27% (12)
use of internet ($n = 45$)	13% (6)	9% (4)	27% (12)	24% (11)	27% (12)
Keyboarding ($n = 43$)	9% (4)	7% (3)	37% (16)	27% (12)	19% (8)
Writing ($n = 44$)	2% (1)	11% (5)	23% (10)	25% (11)	39% (17)
Videoconferencing ($n = 44$)	30% (13)	18% (8)	14% (6)	25% (11)	14% (6)
Webcasting ($n = 40$; n/a =5)	50% (20)	15% (6)	13% (5)	18% (7)	5% (2)
internet discussion boards ($n = 44$)	43% (19)	16% (7)	9% (4)	14% (6)	18% (8)

The last three questions of the pre-pilot questionnaire addressed self-confidence or 'efficacy' in specific areas related to assessing clients experiencing a stroke, solving difficult problems related to nursing care of clients with stroke, and providing other healthcare team members with information to meet the comprehensive needs of clients with stroke. Each question used a five-point scale ranging from low to high confidence. Participant responses can be found in Table 4.

Table 4. Confidence in nursing care of clients with stroke ($n = 46$)

Component	low conf.	some-what low conf.	average conf	some-what high conf.	high conf.
assessing clients with stroke ($n = 45$)	4% (2)	20% (9)	49% (22)	22% (9)	4% (2)
solving difficult problems ($n = 45$)	4% (2)	22% (10)	51% (23)	20% (9)	2% (1)
providing information to health care team ($n = 45$)	2% (1)	27% (12)	49% (22)	20% (9)	2% (1)

Post-Pilot Questionnaire Data Analysis

The analysis of the post-pilot questionnaire data is presented below. Table 5 shows the participants' satisfaction with components included in the stroke course as a technology-enabled course.

Table 5. Satisfaction with the stroke course as a technology-enabled course ($n = 30$, n/a = not applicable)

Component	low sat.	somewhat low sat.	average sat.	somewhat high sat.	high sat.
use of computer			27% (8)	40% (12)	33% (10)
use of internet		3% (1)	10% (3)	47% (14)	40% (12)
Keyboarding			7% (2)	30% (9)	63% (19)
writing ($n= 29$; n/a =1)			17% (5)	28% (8)	55% (16)
Videoconferencing	7% (2)	10% (3)	17% (5)	40% (12)	27% (8)
webcasting ($n = 20$; n/a =10)	15% (3)	5% (1)	40% (8)	15% (3)	25% (5)
internet discussion boards	7% (2)	10% (3)	30% (9)	23% (7)	30% (9)

Table 6 presents findings based on the participants' perceptions of competence in using the technologies that were part of the stroke course.

Table 6. Competence with technology in the study course (n = 30, not applicable = n/a)

Component	low comp.	somewhat low comp.	average comp.	somewhat high comp.	high comp.
use of computer		13% (4)	13% (4)	40% (12)	33% (10)
use of internet		10% (3)	7% (2)	50% (15)	33% (10)
Keyboarding		7% (2)	20% (6)	37% (11)	37% (11)
writing		7% (2)	23% (7)	40% (12)	30% (9)
Videoconferencing	7% (2)	10% (3)	33% (10)	30% (9)	20% (6)
Webcasting (n = 28, n/a = 2)	18% (5)	14% (4)	29% (8)	25% (7)	14% (4)
internet discussion boards	7% (2)	7% (2)	23% (7)	30% (9)	33% (10)

Table 7 outlines the participants' perception regarding the effectiveness/usefulness of the different communication tools used in the stroke course.

Table 7. Perceptions about the effectiveness/usefulness of communication tools (n = 30)

Component	very effective	somewhat effective	effective	somewhat ineffective	very ineffective
internet bulletin board	13% (4)	30% (9)	37% (11)	17% (5)	3% (1)
WebCT handout (n = 23, n/a = 7)	22% (5)	22% (5)	30% (7)	22% (5)	4% (1)
technical support (n = 22, n/a = 8)	32% (7)	18% (4)	45% (10)	5% (1)	

Table 8 presents the participants' satisfaction with the interaction they experienced during the course.

Table 8. Satisfaction with course components (n = 30)

Component	Dissatisfied	somewhat dissatisfied	satisfied	somewhat satisfied	very satisfied
interaction with the instructor		3% (1)	37% (11)	23% (7)	37% (11)
interaction among students		3% (1)	43% (13)	37% (11)	17% (5)

Twenty-eight of the 30 (93%) respondents overwhelmingly indicated that they felt their critical thinking skills were enhanced by the course. In addition, 26 or 87% of the respondents said that they believed they were doing higher-level critical thinking in their work as a consequence of having taken the course.

Table 9 presents findings pertaining to self-confidence or efficacy in dealing with stroke patients after the course.

Table 9. Confidence in nursing care of clients with stroke ($n = 30$)

Component	low conf.	somewhat low conf.	average conf.	somewhat high conf.	high conf.
assessing clients with stroke		3% (1)	47% (14)	43% (13)	7% (2)
solving difficult problems		3% (1)	13% (4)	80% (24)	7% (2)
providing information to health care team			17% (5)	63% (19)	20% (6)

Respondents were also asked to rate the effectiveness of the technology in presenting the course content on a scale ranging from 1 to 5 (1 being low, 5 being high). Forty percent ($n = 12$) indicated they found the technology very effective, 23% ($n = 7$) somewhat effective, 33% ($n = 10$) effective, and 3% ($n = 1$) ineffective.

Academic Pre- and Post-Quiz Scores (Knowledge Exchange)

Thirty of the 46 respondents who agreed to participate in the study completed pre- and post-academic quizzes. In each context, the quiz included 30 multiple-choice questions that participants completed on line at the beginning and the end of the course. Twenty-seven respondents scored much higher (i.e., as many as 9 points higher) on the post-quiz compared to the pre-quiz. The participants who did not show improvement in their scores either achieved the same or a slightly lower score. In all, the majority of learners showed strong improvement in knowledge as measured by the on-line multiple choice quizzes.

Comparison of Pre-and-Post Pilot Survey Results

Table 10 below compares findings based on the pre- and post-surveys.

It is important to note that, for the pre-pilot survey, there were 46 participants ($n = 46$) while only 30 participants completed the post-pilot survey ($n = 30$). To account for this, missing data were removed from analysis where applicable.

Table 10. A comparison of selected pre- post- survey question responses

Pre-Pilot	Post-Pilot	Analysis
<p>Q15. How <u>satisfied</u> were you with the following components as included in technology-enabled courses you have <u>taken in the past?</u></p>	<p>Q6. How <u>satisfied</u> were you with the following <u>components</u> that as included in the pilot you recently completed?</p>	
<p>Use of the computer</p> <ul style="list-style-type: none"> • --- • 4% ‘somewhat low’ satisfaction • 16% ‘average’ satisfaction • 48% ‘somewhat high’ satisfaction • 32% ‘high’ satisfaction 	<p>Use of the computer</p> <ul style="list-style-type: none"> • --- • --- • 27% ‘average’ satisfaction • 40% ‘somewhat high’ satisfaction • 33% ‘high’ satisfaction 	<ul style="list-style-type: none"> • Similar pre- and post-satisfaction
<p>Use of the internet</p> <ul style="list-style-type: none"> • 4% ‘low’ satisfaction • 4% ‘somewhat low’ satisfaction • 17% ‘average’ satisfaction • 21% ‘somewhat high’ satisfaction • 54% ‘high’ satisfaction 	<p>Use of the internet</p> <ul style="list-style-type: none"> • 3% ‘low’ satisfaction • --- • 10% ‘average’ satisfaction • 47% ‘somewhat high’ satisfaction • 40% ‘high’ satisfaction 	<ul style="list-style-type: none"> • Although there are fewer indicating high satisfaction, the average to high satisfaction is greater in the post-course context.
<p>Keyboarding</p> <ul style="list-style-type: none"> • 4% ‘low’ satisfaction • --- • 18% ‘average’ satisfaction • 32% ‘somewhat high’ satisfaction • 45% ‘high’ satisfaction 	<p>Keyboarding</p> <ul style="list-style-type: none"> • --- • --- • 7% ‘average’ satisfaction • 30% ‘somewhat high’ satisfaction • 63% ‘high’ satisfaction 	<ul style="list-style-type: none"> • Post-course satisfaction greater.
<p>Writing</p> <ul style="list-style-type: none"> • 4% ‘low’ satisfaction • --- • 27% ‘average’ satisfaction • 27% ‘somewhat high’ satisfaction • 41% ‘high’ satisfaction 	<p>Writing</p> <ul style="list-style-type: none"> • --- • --- • 17% ‘average’ satisfaction • 28% ‘somewhat high’ satisfaction • 55% ‘high’ satisfaction 	<ul style="list-style-type: none"> • Writing skills perceived to be somewhat improved.
<p>Videoconferencing</p> <ul style="list-style-type: none"> • --- • 6% ‘somewhat low’ 	<p>Videoconferencing</p> <ul style="list-style-type: none"> • 7% ‘low’ satisfaction • 10% ‘somewhat low’ 	<ul style="list-style-type: none"> • Mildly lower satisfaction in the post context.

<p>satisfaction</p> <ul style="list-style-type: none"> • 18% 'average' satisfaction • 29% 'somewhat high' satisfaction • 47% 'high' satisfaction 	<p>satisfaction</p> <ul style="list-style-type: none"> • 17% 'average' satisfaction • 40% 'somewhat high' satisfaction • 27% 'high' satisfaction 	
<p>Webcasting</p> <ul style="list-style-type: none"> • 8% 'low' satisfaction • 8% 'somewhat low' satisfaction • 8% 'average' satisfaction • 50% 'somewhat high' satisfaction • 25% 'high' satisfaction 	<p>Webcasting</p> <ul style="list-style-type: none"> • 15% 'low' satisfaction • 5% 'somewhat low' satisfaction • 40% 'average' satisfaction • 15% 'somewhat high' satisfaction • 25% 'high' satisfaction 	<ul style="list-style-type: none"> • Similar pre- and post-satisfaction
<p>Internet bulletin/discussion boards</p> <ul style="list-style-type: none"> • --- • 6% 'somewhat low' satisfaction • 12% 'average' satisfaction • 35% 'somewhat high' satisfaction • 47% 'high' satisfaction 	<p>Internet bulletin/discussion boards</p> <ul style="list-style-type: none"> • 7% 'low' satisfaction • 10% 'somewhat low' satisfaction • 30% 'average' satisfaction • 23% 'somewhat high' satisfaction • 30% 'high' satisfaction 	<ul style="list-style-type: none"> • Mildly lower satisfaction in the post context.
<p>Q16. How do you rate your <u>present competence</u> in the following areas?</p>	<p>Q7. How do you rate your <u>present competence</u> in the following areas?</p>	
<p>Use of the computer</p> <ul style="list-style-type: none"> • 4% 'low' competence • 20% 'somewhat low' competence • 29% 'average' competence • 20% 'somewhat high' competence • 27% 'high' competence 	<p>Use of the computer</p> <ul style="list-style-type: none"> • --- • 13% 'somewhat low' competence • 13% 'average' competence • 40% 'somewhat high' competence • 33% 'high' competence 	<ul style="list-style-type: none"> • Overall increased 'present competence' after completion of the pilot.
<p>Use of the internet</p> <ul style="list-style-type: none"> • 13% 'low' competence • 9% 'somewhat low' competence • 27% 'average' competence • 24% 'somewhat high' competence • 27% 'high' competence 	<p>Use of the internet</p> <ul style="list-style-type: none"> • 10% 'somewhat low' competence • --- • 7% 'average' competence • 50% 'somewhat high' competence • 33% 'high' competence 	<ul style="list-style-type: none"> • Overall increased 'present competence' after completion of pilot

<p>Keyboarding</p> <ul style="list-style-type: none"> • 9% 'low' competence • 7% 'somewhat low' competence • 37% 'average' competence • 27% 'somewhat high' competence • 19% 'high' competence 	<p>Keyboarding</p> <ul style="list-style-type: none"> • --- • 7% 'somewhat low' competence • 20% 'average' competence • 37% 'somewhat high' competence • 37% 'high' competence 	<ul style="list-style-type: none"> • Overall increased 'present competence' after completion of pilot
<p>Writing</p> <ul style="list-style-type: none"> • 2% 'low' competence • 11% 'somewhat low' competence • 23% 'average' competence • 25% 'somewhat high' competence • 39% 'high' competence 	<p>Writing</p> <ul style="list-style-type: none"> • --- • 7% 'somewhat low' competence • 23% 'average' competence • 40% 'somewhat high' competence • 30% 'high' competence 	<ul style="list-style-type: none"> • Slightly improved rates of competence between the surveys
<p>Videoconferencing</p> <ul style="list-style-type: none"> • 30% 'low' competence • 18% 'somewhat low' competence • 14% 'average' competence • 25% 'somewhat high' competence • 14% 'high' competence 	<p>Videoconferencing</p> <ul style="list-style-type: none"> • 7% 'low' competence • 10% 'somewhat low' competence • 33% 'average' competence • 30% 'somewhat high' competence • 20% 'high' competence 	<ul style="list-style-type: none"> • Overall increased 'present competence' after completion of the pilot
<p>Webcasting</p> <ul style="list-style-type: none"> • 50% 'low' competence • 15% 'somewhat low' competence • 13% 'average' competence • 18% 'somewhat high' competence • 5% 'high' competence 	<p>Webcasting</p> <ul style="list-style-type: none"> • 18% 'low' competence • 14% 'somewhat low' competence • 29% 'average' competence • 25% 'somewhat high' competence • 14% 'high' competence 	<ul style="list-style-type: none"> • Overall increased 'present competence' after completion of pilot
<p>Internet bulletin/discussion boards</p> <ul style="list-style-type: none"> • 43% 'low' competence • 16% 'somewhat low' competence • 9% 'average' competence • 14% 'somewhat high' competence • 18% 'high' competence 	<p>Internet bulletin/discussion boards</p> <ul style="list-style-type: none"> • 7% 'low' competence • 7% 'somewhat low' competence • 23% 'average' competence • 30% 'somewhat high' competence • 33% 'high' competence 	<ul style="list-style-type: none"> • Much higher 'present competence' after completion of the pilot

<p>Q17. How confident are you that you can comprehensively assess clients with strokes?</p> <ul style="list-style-type: none"> • 4% 'low' confidence • 20% 'somewhat low' confidence • 49% 'average' confidence • 22% 'somewhat high' confidence • 4% 'high' confidence 	<p>Q14. How confident are you that you can comprehensively assess clients with strokes?</p> <ul style="list-style-type: none"> • --- • 3% 'somewhat low' confidence • 47% 'average' confidence • 43% 'somewhat high' confidence • 7% 'high' confidence 	<ul style="list-style-type: none"> • Overall increased competence after completion of the pilot
<p>Q18. How confident are you that you can solve difficult problems that arise in the nursing care of clients with stroke?</p> <ul style="list-style-type: none"> • 4% 'low' confidence • 22% 'somewhat low' confidence • 51% 'average' confidence • 20% 'somewhat high' confidence • 2% 'high' confidence 	<p>Q15. How confident are you that you can solve difficult problems that arise in the nursing care of clients with stroke?</p> <ul style="list-style-type: none"> • --- • 3% 'somewhat low' confidence • 13% 'average' confidence • 80% 'somewhat high' confidence • 3% 'high' confidence 	<ul style="list-style-type: none"> • Overall increased competence after completion of the pilot
<p>Q19. How confident are you that you can provide members of the health care team with information that meets the comprehensive needs of clients with strokes?</p> <ul style="list-style-type: none"> • 2% 'low' confidence • 27% 'somewhat low' confidence • 49% 'average' confidence • 20% 'somewhat high' confidence • 2% 'high' confidence 	<p>Q16. How confident are you that you can provide members of the health care team with information that meets the comprehensive needs of clients with strokes?</p> <ul style="list-style-type: none"> • --- • --- • 17% 'average' confidence • 63% 'somewhat high' confidence • 20% 'high' confidence 	<ul style="list-style-type: none"> • Post-pilot survey results reveal improvement in confidence particularly in the no to low categories

Although participant satisfaction with videoconferencing, webcasting, and internet were slightly lower on completion of the course, this can be explained by problems/challenges with videoconferencing, computers, and internet hook ups as experienced by individuals and at the involved sites. These are technical glitches that can be easily resolved; the restriction of a short time frame in which to mount the course did present some technical onsite challenges which the project team believe would be non-problematic in future deliveries. Participant responses to open-ended questions on the questionnaire as well as the focus group data corroborate this interpretation. Participants also indicated in both the open-ended questions and the focus group

sessions that they would have liked more on-line interaction with each other and the instructors. Despite these minor technical ‘glitches,’ there was an overall very positive response and many requests for more similar learning opportunities.

Learning Activities: Analysis of Bulletin Board Postings

There were three sessions delivered by videoconference. Each session was followed by online learning activities and related bulletin board posting. See attached appendices for complete descriptions of Learning Activities 1, 2 and 3.

These bulletin board postings were analyzed for examples of critical thinking according to Johns’ Model of Structured Reflection (1995). Johns’ four kinds of thinking are the following: aesthetic knowing, personal knowing, ethical knowing, and empirical knowing (Johns, 1995).

Learning Activity 1: Neuroanatomy Case Studies

It has been suggested (Rukholm & Carter, 2006) that integration of all four types may reflect a higher level of critical thinking; at the same time, it is also suggested that the design of a learning activity may direct learners/participants to a response that exemplifies a specific kind of critical thinking. For example, in the first learning activity, which focused on ‘factual’ information, participants’ bulletin board postings reflected empirical knowing almost exclusively. While Johns (1995) contends that empirical thinking is least representative of critical thinking because of its singular emphasis on fact, in this evaluation, the bulletin board postings in this course illustrate how assignment design directs students to demonstrate particular kinds of kinds of critical thinking. In the case of first assignment, empirical knowing was foundational to subsequent learning sessions. The task involved completing questions based on two case studies. The content on which the learning activity was based involved neuroanatomy as it is relevant to stroke. An example of Learning Activity 1 as completed by a participant in the course is found below.

Case Study A

In this case study there is definitive left hemisphere damage with involvement of the frontal, parietal and temporal lobe, and possibly the occipital lobe. Frontal lobe damage is seen in the full right hemiplegia (primary motor cortex). In addition, Broca's area is affected as there is evidence of expressive aphasia. Temporal lobe involvement is recognized with the presence of receptive aphasia (Wernicke's area), as Mrs. M does not obey commands. The parietal lobe is also affected as there is primary sensory involvement. It is questionable if there is involvement of the occipital lobe, the right homonymous hemianopsia could be a result of optical tract involvement rather than the lobe itself. Therefore, the arterial supply affected includes the ACA, MCA, and quite possibly the PCA.

Case Study B

The symptoms that Mrs. J presented with lead me to believe that she has had an interruption of the blood supply to the Left side of the Diencephalon and the Cerebellum. Involvement of the

thalamus is recognized in the general right-sided weakness reported. There is also involvement of the mesencephalon, specifically cranial nerves III, IV & V. Cerebellar involvement is evidenced by the presence of ataxia, and the presence of dizziness. The arterial supply involved would be the posterior inferior cerebellar artery and the basilar artery.

Learning Activity 2: Cognitive Perceptual Video Clips

Learners particularly enjoyed this learning activity. As noted in the example below, much learning is illustrated and critical thinking involves empirical, aesthetic, ethics and personal kinds of thinking.

Message no. 158 Posted on Saturday, March 25, 2006 12:56pm Subject: Learning Activity for Cognitive and Perceptual Disturbances 1a B and 2

1 a. The five cognitive or perceptual deficits I observed in part 1 of video b were left neglect, memory, sequencing, problem solving, and spatial relations. The pt had forgotten to eat her toast again which was on the left side of the plate she also didn't dress her left arm when putting on her sweater, which indicates, left neglect. The pt had problems with memory as she had forgotten about the date and time of the party that was occurring that day. The pt did not complete all the steps in the appropriate order for the transfer from the chair to the wheelchair, which indicates a deficit with sequencing. The pt had difficulties with problem solving when she was trying to put on her sweater. The pt did judge the correct distances between the chair and the wheelchair, and distance from the front to the back of the wheelchair which indicates spatial relations deficits.

1 b. The nurse used strategies to help correct the deficits. A large stripe of yellow tape was used to bring the pt's attention to the left side of her plate during meals. The Nurse used cueing and assisted the pt to dress her left arm before her right. The nurse reminds the pt to look to the left at the calendar and read what is on today's date, which in turn reminds the pt of the party. The Nurse gave short and simple instructions, cueing and boding guidance to assist the pt to make a safe transfer to the wheelchair. The nurse used cueing and the focal point of the tag to aid the pt in putting on the sweater in the proper order. The nurse asks the pt to insure her feet are flat and to stand straight and turn, and back up until she felt the wheelchair before sitting therefore cueing aided with spatial relations.

2. I am currently working with a pt that has had a stroke and has issues with sequencing. In order to help the pt everything must be done at the exact time, order, and way. If the pt is asked to do anything different such as: put on his pants before his socks, go to physio 5 mins early, if the kitchen brings his breakfast 10 mins late, or if you do not understand what he is saying the first time he speaks (as he has speech problems) he becomes emotionally upset and will yell. I try to keep to his schedule as much as possible, although when it is not possible I apologize and reassure him and try to get him to smile.

Learning Activity 3: Communication Reflective Activity

In the example for the last learning activity, the posting illustrates very high level of thinking that integrates all four types of critical thinking: that is, empirical (*I have been learning more about*

aphasia...), aesthetics (It really was a pivotal moment for her, and it really struck me, that there he was, listening to us, and getting it all in, just unable to respond back, until something struck him as humorous), personal (I felt very bad for her), and ethical (What a horrible thing it must be for them to be locked in their expressionless bodies. I will make more of an effort to try and connect with the speechless person that is inside). The learning this nurse has experienced is profoundly important not only for the patient but also for the family member.

This is a very recent experience.

I had an experience with a family of a man suffering from an advanced brain disease at a young age. They had had their appointment with their specialist, and had all been present to hear some very dismal news about prognosis, and lack of further treatment options. The man had become for the most part totally aphasic, with little to no verbal activity, had required some ongoing sedation for behaviour issues, and was unable to move most of his body. Clearly, this was very sad, and his family was going through a very hard time, with denial and guilt and fear tearing them apart. His wife, who had been his principal caregiver, said to me. " I can't talk to him anymore" " He doesn't know what I am saying and can't answer my questions". I felt very bad for her, but said to her myself " I have been learning more about aphasia, and communication difficulties, and one thing I have realized is very important, is that, just because someone doesn't answer our questions, or look interested, does not mean that they don't understand. It is just possible that you husband knows exactly what you are saying, and his disease is impairing his ability to produce speech or even expression that would let you know that he understands. We don't know what gets in" I told her that "if he was my husband or father, that I would come in every day, and I would talk to him, like nothing was different, and I would tell him everything that was happening, like one day the cat went out, and the next day that the cat came in...". At that moment the patient's eyes lit up, as he looked at me, and he laughed, obviously at my joke about the cat. The wife looked at me quickly, and I said, "Well, I guess that sort of makes the point that he can hear you and understand what you are saying". It really was a pivotal moment for her, and it really struck me, that there he was, listening to us, and getting it all in, just unable to respond back, until something struck him as humorous. It is unfortunate that aphasic patients are judged as hard of hearing or lacking cognition what a horrible thing it must be for them to be locked in their expressionless bodies. I will make more of an effort to try and connect with the speechless person that is inside.

As the next example of Learning Activity 3 reveals, learning extended beyond patients and their family members to others. The learner also shares her appreciation for the notes provided in the session. (PowerPoint slides). She intends to share these notes with colleagues unable to participate in the course. The posting illustrates empirical, aesthetic, and personal critical thinking skills.

Message no. 204 Posted by on Saturday, April 1, 2006 3:14pm Subject: final learning activity

Have learned lots in this program, and now have the ppt. slides to review and share with colleagues - truly helpful learning tool - thanks!

One of our most challenging stroke patients was a middle-aged woman, from the local correctional facility. Initially, her care and routines were hampered by the continual presence of correctional officers, where they would often answer questions on her behalf. There were certainly difficulties convincing correctional officers that in addition to being unable to speak, this patient was unable to mobilize independently or with assistance. Over the course of her care, we provided education to correctional officers in addition to the patient - a captive audience, for sure! By making it fun and humorous, we were able to keep her engaged for short periods of time, provided entertainment and fun to her care, and improved some of her depressive symptoms and adverse behaviours.

Focus Group Data Analysis

Critical Thinking

Several participants in the focus groups identified critical thinking as involving three elements: assessment of a situation, dealing with it, and prioritizing. Another participant stated that, following the course, her critical thinking skills were enhanced because “I knew right away where I had to go, what I was looking for, and what it was in reference to.” Aside from enhancement of their individual critical thinking skills, many participants spoke about how the knowledge and skills they had acquired by taking the course would be shared with colleagues and co-workers who had been unable to participate, “My binder is staying here at work and it is here for anyone to access.”

Below are a number of salient points and some direct quotations taken directly from comments offered by participants in the focus groups:

What does critical thinking mean to you?

- Having access to information and resources (physical, human), knowing what to look for as well as where and how, using information to build knowledge
- Assessing information for quality
- “Integrating what you see (the situation) with what you know based on resources such as quality peer reviewed articles and other sources of knowledge”
- Evidence-based practice based on sources of information that are reliable and accurate as well as using evidence in decision making
- “Critical thinking skills come with experience”
- Reflection
 - What did I do ‘right’? (confirming and changing practice)
 - What could I improve?
 - Doing reflection on an ongoing basis

What particularly enhanced your experience of critical thinking in this course?

- “The videos which were basically an application of skills....seeing evidence....I guess because I am visual I need to see the evidence....”
- Videoconferencing and the interaction with other sites

- Videoconferencing
- “Combination of all of the.... I think it is wonderful...sort of paired up webcasting with video conferencing with handouts...because everybody learns differently and ... having access... all those different types... going back to the webcast... components fit together to be able to incorporate the learning best.”
- “I think everything was complimentary. It was certainly catered to pretty much any learning style and one method just reinforced the other.”

How important are critical thinking characteristics (open-mindedness, inquisitiveness, and the notion of ‘truth seeking’) to successful learning in a course delivered technologically?

- “I don’t think the education format was a barrier to open mindedness and/or inquisitiveness?”
- “Reduced the barrier because of distance...”
- “Have to be open-minded to start – bombarded with technology information...”
- “I am comfortable with technology – education timely, interesting, so I was open-minded and I was inquisitive and you delivered a lot of evidence-based information.”
- “If you have a desire to learn, then you have open-mindedness.”
- “The more technology and more resources to access the better...Whole project achieved what set out to achieve.”
- “Have to have some critical thinking skills to even have embraced the technology and this format to begin with or to have used it.”
- “Don’t think the technology and this format to begin with would probably be a good fit with someone who is a passive learner – who wants to be spoon fed...”
- “The fact that links were available, each link opened up another door for you up to you how far you wanted to go.....on some of the evidence based (truth seeking) stuff. So, I think it was as restrictive or as open as each learner wanted it to be.”
- “The videoconferencing let us interaction; we could ask questions and gain immediate feedback/clarification; hitting ‘mute’ let us discuss locally and then seek clarification/feedback option.”
- “Webcasting and internet resources were there to return to later.”
- “The level of knowledge was geared to the learner.”
- “Presenters and others in the audience can help you become inquisitive.”
- “To talk about things or maybe post something and go back there later to find out how someone answered your question was great you might have 10 different answers from 10 different peoples with 10 different experiences”
- “And as far as inquisitiveness, I found this course made me look for different sites out there – reliable sites (internet). It (the course) made me want to learn more.”
- “Online allows time to think, reflect, and ask questions.”

Discussion

The findings illustrate the very positive views the participants held about the course content and the selected delivery modes. Participants indicated that the content was current, up-to-date, and very helpful for their practice. They further indicated that the blended delivery mode of videoconferencing, webcasting, and an online learning site was particularly useful/helpful. For example, the videoconferencing supported immediate clarification of questions and problems while webcasting allowed those unable to attend the 'live' videoconference session to see the session at times convenient to them afterwards. This latter point is critical because not all nurses were able to attend sessions. In smaller settings, there may be insufficient resources to cover the absences of all those who wish to attend an educational session.

Also of note is that, at one location in northeastern Ontario, there were more than 10 participants including nurses and other health care professionals. This is important in that the intent had been to target Registered Nurses and Registered Practical Nurses although any healthcare professional was welcome. The individuals at this one location not only participated in the course but also eagerly took part in all aspects of the evaluation process including a focus group session, which they attended en masse. This enthusiasm and commitment to learning and sharing the knowledge with other co-workers was not unique to this site and exemplifies the need and appreciation for continuing education in specialty areas.

Those who were able to participate in the live video sessions indicated they tended to take in the webcasts as well in order to reflect and refresh their learning. The online postings based on learning activities, other participant-initiated bulletin board postings, and academic quizzes likewise served to reinforce learning. Participants, for the most part, indicated that they would have liked additional interaction opportunities through synchronous chat and other bulletin board activities. While one of the challenges with large groups studying on line is the management of the volume of requests as this can be very labour intensive for the instructor, it was clear that the participants were eager for, in the words of one participant, "more, more, more" of this type of learning opportunity.

Conclusions and Recommendations

The project was highly successful with strong interest in taking the course expressed by 96 individuals, despite a very short time frame between advertising and delivering the course. In a period of less than a month, the course's availability as a pilot was advertised through the assistance of Regional Program Managers and a Regional Stroke Education Coordinator. As telehealth technology is available in almost every hospital in Ontario, and nurses were able to access the program with no travel costs, or lost wages, the demand for the program was higher than expected, and registration was closed within several weeks of the initial posters being circulated. Participants attended videoconferencing sessions, viewed webcasts, and completed on-line quizzes and learning activities. There were improvements in all areas with a few exceptions and a number of suggestions for improving the delivery of the course were offered. In particular, recommendations were made regarding the on-line learning site and interaction. The content was regarded to be excellent although some participants found the quantity of content to be heavy and would have preferred the content to be spread over four sessions rather than three.

The recommendations that emerge from this report are based on the overwhelming need for accessible continuing education opportunities for nurses in general and for nurses working in rural, northern and isolated areas in particular. Recommendations include the following

- More of these kinds of learning opportunities on an ongoing basis
- Needs assessment to determine future topics and how often they should be delivered
- Further analysis of the effect of this type of education on the development of expertise within a region
- An environmental scan to determine funding sources, topics, potential partners, and so forth,
- Establishment of partnerships between experts in practice, acute and long term care facilities, NORTH Network, educators, and organizations such as Heart and Stroke, the Cancer Society, and the mental health sector (Kirby Report)
- Seek out funding to develop this particular program into a full university credit course through Laurentian University School of Nursing. Courses designed such that the learning experiences are eligible for university credits in nursing programs is especially needed in rural and northern areas where nurses tend to be predominantly diploma prepared.
- Long term evaluation of knowledge translation into practice

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Appendices

Appendix A: Four Ways of Knowing

Aesthetics	<ul style="list-style-type: none">· What was I trying to achieve?· Why did I respond as I did?· What were the consequences of that for the patient? Others? Myself?· How was this person(s) feeling?· How did I know this?
Personal	<ul style="list-style-type: none">· How did I feel in this situation?· What internal factors were influencing me?
Ethics	<ul style="list-style-type: none">· How did my actions match with my beliefs?· What factors made me act in an incongruent way?
Empirics	<ul style="list-style-type: none">· How knowledge did or should have informed me?

Note. Based on Johns, C. (1995).

Below are elaborations of the four ways of knowing as they might occur in a nursing education context:

Aesthetic Knowing

Aesthetic knowing often involves challenges to the self as well as reflection on what the person is trying to achieve and why she or he responded in a particular way. This kind of thinking also tends to focus on the feelings of others and the experience of consequence.

A statement such as “*I am much more comfortable discussing these things issues with strangers than I am with a good friend...When I got to this section with my volunteer, I could feel my words were not coming as easily as they had been and my tongue was tripping on itself (I am certain my cheeks were also showing it!)*” suggests self-analysis as the nurse reflects on why she

responded as she did. Other examples of aesthetic thinking include statements dealing with consequence: this sense of consequence often related both to the patient and the nurse, “*We did try tympanic ones (thermometers) for a few months but we found they increased the amount of suspicion for many of our paranoid patients as they didn’t trust the ‘device’ we were sticking in their ear.*” On the other hand, the following statement places the nurse squarely in the context of the nursing situation: “*Completing a comprehensive health history on my willing volunteer proved to be a very valuable and interesting experience. It not only reinforced some of the skills I already use, but refreshed other areas that I may not have had the opportunity to utilize very much in my current practice.*”

Aesthetic knowing is also said to involve consideration of how the other person is feeling. This is reflected by statements such as “*These symptoms, although not causing any immediate distress to Mr. B. , have caused him enough concern to talk about them at this annual assessment which leads me to believe that he is worried.*”

Personal Knowing

While similar to aesthetic knowing with a focus on feeling, personal knowing is almost always about the self and is often an attempt to answer questions such as “*How did I feel in this situation?*” and “*What internal factors influenced my behaviour?*” For example, the following comment is clearly about one nurse’s sense of self in relation to a clinical situation with potential for personal embarrassment:

I thought that I had gotten over feeling embarrassed about asking personal questions...I really felt this was the most difficult part of the interviewing process for me and my discomfort probably made it harder on the volunteer as well.

Ethical Knowing

Ethical knowing deals with the issue of congruence between a nurse’s actions as a professional and his or her personal value system. It is about wrestling with questions such as “*How did my actions match with my beliefs?*” and “*What factors made me act in ways that do not fit with my values?*” An example of this kind of thinking is evident in the following statement:

One of the challenges that an interviewer may encounter is when the patient describes something in their life that conflicts with your own values or morals...such as teen pregnancy, abortions, sexual orientation, use of cigarettes, alcohol or street drugs, a person’s choice to refuse blood transfusions.

A second example of a nurse in a situation involving ethical knowing is described below: “*Do you think this is ethical practice (kissing foreheads to assess temperature) or it is violating patients’ rights? I have been doing this for 35 years and have never been denied a forehead; in fact most patients give me a beautiful smile and a thank you.*” In this passage, one nurse’s personal values and practices require special thinking about given the ethical rights of another person within the context of a professional relationship.

Empirical Knowing

The nurse considers how nursing knowledge informed (or should have informed) practice.

Appendix B: Learning Activities

Learning Activity 1

In this learning activity, you are asked to read two case studies and post your answers on the Bulletin Board. Please make your posting in the section of the Bulletin Board called Neuroanatomy and Cerebral Circulation Review.

Although you are welcome to present your answers in point form rather than in sentences, be sure that all point form answers are clear and complete. If you have additional comments to make based on something you have learned in the relevant nursing literature on stroke, please feel free to add this information to your answer.

For a sample of a completed case study to use as a model, visit the Bulletin Board and read the case study found at Sample Posting.

Case A

Mrs. M is a 78-year-old woman brought to the ER for possible thrombolysis for acute ischemic stroke. The patient was well until between 3:30 and 3:40 pm as she had made a cup of tea for her husband. At 3:40pm she was found slumped on the floor in the kitchen, unable to talk and a dense hemiparesis on her right side. An ambulance was called and she was brought to the ER.

Her heart rate is 90/min and irregularly irregular. Her blood pressure is 160/110. There are no carotid bruits or cardiac murmurs. Her basic blood work is unremarkable except for her blood glucose is 11.3. Cardiac enzymes are negative. Her PT-PTT is normal. Her ECG reveals atrial fibrillation at 112 I/min.

On examination, the patient is awake and alert but unable to say her name, age, or month. She does not obey commands. She has a right homonymous hemianopsia. She has a mild right upper motor neuron facial weakness. She has a right hemiplegia involving her right arm and leg with no movement. She is able to move her left side normally. There is no incoordination. Reflexes are normal except for a right plantar response is up going. She does not appear to respond to pinprick on the right side.

Her past history is significant for Type 11 diabetes, hypertension, coronary artery disease with angina and chronic atrial fibrillation. There is no history of bleeding disorders or surgery. She has no allergies.

Arrival in the ER is 4:13 pm.

Questions

Identify the lobe of the brain that is most likely affected.

Identify the blood vessel(s) that supply the lobe most likely affected

Learning Activity 2

As the first part of this learning activity, you are asked view the two sets of video clips (Scenario A and Scenario B, each with two parts), noting which cognitive and perceptual difficulties seem to be present and what strategies the therapist uses with the patient. Then complete the work described below.

Based on what you observed in one of the scenarios (Scenario A or Scenario B), prepare answers for the two questions found below:

- a. List five cognitive or perceptual deficits that you observed in Part 1 of the video.
- b. Describe five strategies that you observed the nurse using with the person with stroke in Part 2 of the video.

In addition, consider a patient with stroke with whom you are working. Think of one of his or her cognitive or perceptual difficulties. Describe one or more of the strategies you have used with this patient in the past week. If necessary, consider a patient you have worked with in the past and a strategy you used with this patient. Is there anything you might do differently with this same patient now?

Post your work on the Bulletin Board.

Please make you posting in the section called Strategies to Manage Cognitive and Perceptual disturbances in Clients with Stroke.

For a sample to use as a model, visit the Bulletin Board and read the sample found at Sample Posting.

Learning Activity 3

In this learning activity, you are asked to do the following:

Share a story from your personal, academic, or clinical life where you interacted with someone who had communication impairment. You can choose any type of communication impairment: it does not have to be stroke-related. In your story, recount what the individual was or was not able to do as well as how you helped (or hindered) the communication interaction.

In addition, based on your reading of the article “Revealing the Competence of Aphasic Adults through Conversation” found in your Resource Package, describe what you would have done differently. Suggest a life lesson related to this incident.

Post your work on the Bulletin Board. Please make your posting in the section called Assessment and Management Treatment Strategies for the Management of Aphasia in Stroke Patients.

For a sample to use as a model, visit the Bulletin Board and read the sample found at Sample Posting.