Designing and Delivering Online Professional Development to a Global Audience

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Introduction

Steppingstones created the Learning Nurse Resource Network (LearningNurse.com) website in April 2008. Its purpose was to research and evaluate different approaches and strategies to providing convenient and safe online informal learning opportunities for nurses world-wide.

The Learning Nurse website uses the open-source Joomla content management system (CMS) to manage the core information. Custom scripts employing PHP and MySQL tools were used to develop the interactive components of the site. The website is hosted on our leased, fully-managed, high-end dedicated server.

Features

Our goal for the Learning Nurse website was to make it useful and relevant for nurses, as well as easy and convenient to use. We attempted to accomplish this in several ways.

- The service is free and therefore affordable; also there are no hassles or security issues associated with payment management.
- The website is clean and uncluttered; we do not allow any advertising or pop-ups.
- The service and results are anonymous and confidential; no registrations or logins are required; the nurses do not have to worry about anyone seeing their results.
- The service is always available (7 x 24 x 365 days); because we use a dedicated high-end server, performance and uptime have been excellent.
- The nursing content is current and relevant; it was developed from the latest university nursing textbooks.
- Our focus is on nursing foundational knowledge and competencies – the basic and core nursing stuff.
- Our learning activities are kept to manageable chunks that can be completed in 20 minutes or less; this means learning can be done when time is available.
- We collect anonymous data for research, analysis, feedback and evaluation; this information is used to improve our learning activities and resources, and is freely shared with others.
Reasons

I am often asked what was the motivation for undertaking this initiative. Here are some of the reasons.

- I have four decades of experience with e-learning, education and training.
- I have ten years of experience developing detailed nursing competency profiles in eight Canadian provinces.
- During my work with nurses, I became aware of how difficult it is for many nurses to access professional development opportunities using traditional approaches.
- Nursing knowledge and practice is fairly similar across the planet; therefore, there is huge potential audience for nursing PD resources.
- I wanted to leverage our learning materials and resources to a large groups of users, i.e., five to six million English-speaking nurses.
- I wanted to see how much of a difference and impact online learning can make to the competence maintenance and enhancement of a profession.
- I wanted to demonstrate that there are creative and affordable solutions to address the escalating and unsustainable costs of health care services.
- I wanted to implement the “ideal” online learning system, incorporating all I have learned over the years, and to do it my way!
- I wanted to develop and expand my own professional knowledge and expertise.
- The website provides us with a great opportunity and mechanism to conduct research and development about online learning.
- The Learning Nurse serves as an international showcase for Steppingstones’ capabilities and expertise in this growing area.
- The site would directly or indirectly create new sources of revenues for the Company through e-learning development and production contracts.
- The most important reason is simply because I wanted to do it! And since I own the company, I don’t need to convince anyone or have to overcome the usual corporate or organizational obstacles.

The Learning Nurse initiative has already generated contracts for Steppingstones. More importantly, it proved to be tremendously useful in adding to our knowledge about effective strategies and techniques for using online learning for professional development and continuing competence programs. We will share some of the lessons learned in this presentation.
Benefits

An online training approach has many significant advantages over traditional “stand-up-and-tell-them” workshops and seminars. These benefits include:

1. **Ongoing training** – rather than a one-time, temporary solution using workshops, an online training system offers a “permanent” solution where training can be delivered for years to come.

2. **Recertification** – an online training solution makes it a lot easier for members to recertify (at their convenience) as required every few years; the system can manage, track and report on recertification in a real-time basis.

3. **Cost savings** – having the training delivered online results in cost savings in the following areas:
   - Less lost productivity because nurses don’t have to be away from work
   - No expenses for travel, meals and accommodations for the learners
   - No fees and expenses for instructors
   - No expenses for renting training rooms, facilities and equipment
   - Less expenses for printing and production of handouts and course manuals.

4. **Convenience** – online training is available to learners at any time, and at any place – so long as there is Internet access. The nurses can learn when they have time and at a location that is convenient to them.

5. **Effectiveness** – an online learning system enables just-in-time learning. This allows nurses to learn only what they need to know, exactly at the time they need the knowledge to do their task or job. Also, learners can review the materials to refresh their knowledge at any time.

6. **Efficiency** – research shows that e-learning courses progress 50% faster than traditional courses. This is because learners can progress at their own rate, can skip material already known, and can focus on those topics they really need to learn. Learners will therefore spend less time away from their work.

7. **Pacing** – unlike a classroom setting, with online training the learner can progress at her / his own pace, pausing or replaying sections of the module, or redoing the lesson as many times as is required to learn the content and pass the tests.

8. **Retention** – good e-learning modules include audio, interactions and other aids to learning; also the learner has the ability to pause or replay sections of the training that
may have not been clear the first time around. Research shows that spaced, measured learning results in better retention than massed learning (i.e., multiple day workshops).

9. **Consistency** – quality online training is developed and delivered consistently (and accurately) to all learners. It does not depend on the knowledge and teaching skills of the instructors, whose abilities and delivery styles / effectiveness may vary significantly.

10. **Availability** – once the online modules have been developed and tested, there is no additional costs related to making the training available to other interested parties / stakeholders.

11. **Equity** – online learning is particularly valuable to learners working in remote or rural communities where it is more difficult (“can’t be spared”) and expensive to participate in the traditional learning activities that are often only available in larger urban centers.

12. **Updateability** – if there are any minor or major changes to the content, then it is relatively easy to update the online learning modules and related resources. Having to do so using the workshop method would be expensive and time consuming. This means the content and information are always current and relevant. Also, with online learning systems, the learners can be notified electronically as important changes or additions are made to the materials and resources.

13. **Scalability** – once an online learning delivery and tracking system has been set up, it is relatively easy to add additional training modules, tests / quizzes and other resources.

14. **Affordability** – online modules are relatively easy and inexpensive to produce and implement using today’s rapid e-learning tools and digital technologies.

15. **Data** – online learning systems can be set up to automatically capture data related to learner utilization and performance. This data can then be used to assess and monitor the results of the training, and can also be used to assess and evaluate the effectiveness of the training modules and tests.

**Disadvantages**

There are also some disadvantages associated with online learning.

1. **Best for knowledge** – e-learning is best for knowledge learning and is not as effective for psychomotor skills training.

2. **No instructor** – no instructor is available to answer questions and clarify points.
3. **Less group interaction** – it is more difficult to engage in group activities and group interactions with online professional development; this can partially be overcome using forums, chat and the social networking media.

4. **Lack of suitable learning materials** – it may be difficult to find appropriate, quality online learning modules; to develop quality e-learning resources takes expertise, time and resources.

5. **Requires discipline** – self-directed, online learning requires greater individual motivation and discipline.

**Learning Nurse Users**

Here are some statistics on the visitors to the Learning Nurse website from January 1 to November 12, 2010. An analysis of the website traffic showed:

- 22,000 unique visitors (IPs); traffic is steadily growing every month.
- 38,300 visits with 761,000 page views and 72.6 GB of bandwidth.
- 24 hour traffic with many during night shifts.
- 15% of the visitors spend 30 minutes of more per visit.

A reverse IP lookup of the “serious” visitors (those with 150 page views or more) showed the following geographical location of the visitors to the website.

- 51% came from the United States – 44 states with the highest traffic from Vermont, Georgia, Virginia, California, South Carolina, Illinois, Connecticut, Florida and Texas.
- 20% came from Canada – all 10 provinces with the highest traffic from British Columbia, Saskatchewan, Ontario, Manitoba, Quebec, and Alberta.
- 8% of the traffic came from the United Kingdom (Great Britain).
- 7% came from Australia with the highest traffic from Victoria, New South Wales, Southern Australia, Queensland and Tasmania.
- 4% from the Philippines, 2% from India, 1% from Saudi Arabia, and 1% from New Zealand.
- 5% came from 26 other countries – Malaysia, Jordan, Jamaica, Cyprus, Ireland, etc.

This analysis shows that these visitors come from hospitals, clinics, long-term care homes and colleges and universities. We do not know what portion of our visitors are nursing students as compared to practicing nurses.
An analysis of how visitors came to the Learning Nurse website showed:

- 85% come directly from a bookmark or URL entry.
- 12% come from a search engine – Google, Yahoo and Bing:
  - a search for “nursing quizzes” or “nursing quizzes online” lists LearningNurse.com as either number one or two
  - 54% of search phrases are related to “nursing quizzes”
  - 30% of search phrases are related “learning nurse”
- 3% of visitors come from links at other websites.
- 134% of visitors bookmark the Learning Nurse website.

In addition, a number of the Learning Nurse quizzes rank high (page 1) on Google searches:

- Pediatric nursing quiz – # 1
- Oncology nursing quiz – # 1
- Disease terminology quiz – # 1
- Drugs and seniors quiz – # 1
- Dosage calculation quiz – # 3
- Medication administration quiz – # 3
- Metric conversion quiz – # 4
- Medications errors quiz – # 7
- Cardiology quiz – # 8

This latter data suggests that we have a loyal and high-repeat audience for the website.

Components

The Learning Nurse website currently consists of several different types of learning resources. These include:

1. **Professional development** – describes a suggested six-step process that nurses should use to get the most from their individualized professional development program.

2. **Self-assessment tools** – 26 self-assessment forms (with a total of 644 competencies) for nurses to evaluate their nursing competencies in core, advanced and specialized nursing areas. Each self-assessment tool is available in print format and as an online form. (Online SA form results are not yet captured in any database table).

3. **Test and quiz center** – we have created 102 free online nursing quizzes with 6,602 questions for the professional nurse to assess / test / refresh her knowledge and competence. Quiz results are anonymously captured and reported in real-time.
4. **e-Learning center** – this component includes a few prototype e-learning modules and simulations. Nursing Nuggets lists 50 common mistakes made by nurses and how to avoid / prevent them. This section also has links to other quality external e-learning resources of interest to nurses.

5. **Personality diagnostic tools** – We have developed eight self-scoring diagnostic tests to help individuals understand themselves better. These tools can assist to identify areas where people can change and/or improve their personal skills.

6. **Medical video resources** – these are links to other websites that have hundreds of medical videos online that may be of interest to nurses.

7. **Medical information podcasts** – is a selected list of Podcasts from the US Centers for Disease Control and Prevention (CDCP) website.

8. **Library and resources** – links to some additional resources that nurses may find useful for their competency maintenance and professional development.

9. **Other information** – this includes the Learning Nurse newsletter, jobs for nurses, numbers of nurses, links to nursing organizations and schools (top menu) and information about Steppingstones and our services.

Some of the information was developed for our own use (nursing links and numbers of nurses), but has also proved to be useful in generating links from other websites and thus increasing search engine optimization (SEO).

Here are the top most popular Learning Nurse website pages based on page views since inception.

- Learning Nurse Tests and Quizzes 40,000 page views
- Test and Quiz Center 18,700
- e-Learning Center 4,800
- Professional Development for Nurses 4,700
- Personality Diagnostic Tools 3,500
- Other Tests and Quizzes 3,100
- Library and Resources 2,800
- Resources of Nurse Educators 2,500
- Medical Video Resources 2,500
- Learning Nurse e-Learning Courses 2,300
- Nursing Competence Self-Assessment Tools 2,100

Each of the major components will now be discussed in detail.
Test and Quiz Center

The Learning Nurse Test and Quiz Center is by far the most popular and used component on the website. Here are some observations related to the nursing quizzes.

- We originally used online quizzes when a client wanted to convert existing paper tests to make marking, recording and analysis easier.
- The quizzes were considered as a complementary tool to the self assessments in indentifying learning needs.
- Quizzes provide a great “reality check” to the self-assessment tools.
- We discovered that the quizzes became very popular and we installed quiz systems for several other clients.
- The Learning Nurse currently has 102 quizzes with 6,602 items.
- The latest quiz software offers many different types of question types; we typically use multiple choice / response, matching and true / false.
- The quizzes are set to randomly select 25 or 30 questions from a pool of items, and randomly present the questions and response choices.
- Questions are submitted one at a time, with the correct answers, and often a detailed explanation, provided after each user response.
- Quizzes are created in Word, then copied and pasted to QuizCreator, converted to flash, and then uploaded to the Learning Nurse website.
- The quiz data is anonymously captured to a database table on our dedicated server, and reported in real-time to the Learning Nurse website where the results can be searched, queried, sorted and reported.
- We discovered that the quizzes were being indexed by search engines but with no information; we now modify the html code on the home page, within which the flash quiz is embedded, to include appropriate META tags. We also add links to the quiz center and the Learning Nurse website.
- Research shows that “discovery” learning is four times more effective than simply reading or listening.
- Even “boring” topics such as anatomy terms are popular quiz topics.
- Today’s quiz software allows use of multimedia – we have experimented with audio, background music, images and video; all of these increase bandwidth and affect performance, but we don’t really know if there is a significant enough improvement in learning to justify using them.
- We haven’t found one quiz creation software package that meets all of our needs; we currently use Wondershare’s QuizCreator (v2.6), Articulate’s QuizMaker and
An analysis of 33,705 Learning Nurse quizzes was completed and some of the results are shown below. Between 40 to 200 quizzes are completed every 24 hours! The quiz results are tracked on the website in real time, both in a searchable query table, and in a series of statistical reports for each quiz.

The ten most popular quizzes are:

- Medical Terminology I (2,483)
- Anatomy Terminology I (1,520)
- Disease Terminology I (1,467)
- High Blood Pressure (1,224)
- Cardiology Terms (1,208)
- Safe Medication Principles (1,195)
- Medical Terminology II (1,119)
- Medication Abbreviations (990)
- Pediatric Nursing I (873)
- Infection Prevention and Control (860).

The five least completed quizzes are:

- Nasal and Sinus Disorders (9)
- Herb-drug Interactions (11)
- Ear Pain (14)
- Dizziness (20)
- Dangerous Drug Combinations (21)

It is important to point out that the completion of quizzes may be partially related to the length of time the quizzes have been on the website. For example, some of the least completed quizzes have only been added recently.

Average scores are computed for all of the completed Learning Nurse quizzes. The ten highest scoring quizzes are:

- Medication Abbreviations (93%)
- Managing Patient Rage (91%)
- Injection Dosage Calculations (90%)
- Tablet Dosage Calculations (87%)
- Fluid Dosage Calculations (86%)
- Intravenous Flow Rates (82%)
- Cardiology Terms (81%)
• Anatomy Terminology II (77%)
• Antidotes (77%)
• Ecstasy / MDMA Facts (76%).

The five quizzes with the lowest average scores were:

• Cancer Risks (34%)
• Dangerous Drug Combinations (40%)
• Nutritional Disorders (42%)
• Diagnostic Tests I (45%)
• Mental Status (46%).

A complete list of the Learning Nurse quiz results (frequency and average scores) is available from the October 2010 issue of the Learning Nurse Newsletter posted on our website.

**e-Learning Center**

The e-Learning Center has 4 sections: a) one for the nursing e-learning modules that we have developed; b) one for Nursing Nuggets modulettes on how to prevent common nursing mistakes; c) one for nursing diagnosis simulations; and, d) links to other websites that also have e-learning courses of interest to nurses.

Here are some of our thoughts and experiences with the e-learning component.

• We initially became interested in online learning because clients were looking to provide additional learning opportunities to their members on their competency management websites.
• We use rapid e-learning technology – PowerPoint with added narration, converted to Flash video using Articulate software, and uploaded to the website.
• The e-learning modules typically have a quiz embedded at the end for feedback and evaluation; we do not record or track these quiz results.
• We do NOT use any Learning Management System (LMS) as it is overkill for our needs.
• There has been limited development of e-learning modules so far due to lack of time, resources and direction (e.g., what topics).
• We have experimented with different approaches and prototypes; however, so far we have not received enough feedback to reach any conclusions as to which works best with our nurse learners.
• It is a challenge to design engaging and interesting interactive learning for many topics; also the more complex the design, the more time and resources are required to produce.
• We believe that professional narrators make for a better e-learning experience; we have some evidence that two narrators (male and female) hold interest and attention better than a single narrator; however, this does increase the costs and work.

• We need more research and data on the cost-benefit of certain e-learning applications; this became particularly evident in our Nursing Nuggets series – how much more effective is the more expensive e-learning version as compared to the cheaper paper version?

• In our simulation prototype, we use animated “patients / clients” to respond to a series of questions that a nurse would ask; this approach will help nurses develop their critical listening and thinking skills.

• Using PowerPoint to create simulations is very intensive and complex; we would like to develop a database approach to developing and producing nursing simulations.

• We would like to incorporate more images and videos, but access, cost and copyright issues are problematic.

• According to the poll on the website, users indicate they want more quizzes as compared to more e-learning modules; this creates some uncertainty as to where to devote our future energy and resources.

**Personality Diagnostic Tools**

These are self-scoring, anonymous tests designed to increase self awareness on a number of personality dimensions that may impact the success of nurses at work. These tests are:

• Acceptance of Diversity Profile (78)
• Analytics Profile (86)
• Conflict Resolution Profile (217)
• Empathy Profile (97)
• Listening Profile (108)
• Preferred Learning Style Profile (175)
• Time Management Profile (184)
• Work Stress Profile (94)

The numbers in brackets ( ) indicate how many completed records currently exist for each test.

Here is some more information on the Learning Nurse personality diagnostic tests.

• The tests were developed after researching existing tools and making additions and modifications.

• After completion of each test, immediate scores and feedback are provided.
• Tips on being more effective on this personality dimension are provided for some of the tests.
• We collect some demographic data on each test (gender, type of nurse, years of experience and work environment).
• The scores are anonymous, but ALL data is saved to a database table for future analysis and research.
• The results are intended to be used to better understand our target audience, and to provide materials for research reports.

Promotion and Marketing

Even though the response and feedback to the Learning Nurse website has been very positive, making nurses aware of these professional development resources has been difficult and challenging. Here are some of the things we have tried with varying success.

• We did two mailings to all RN and LPN national, provincial / state associations in Canada and the United States; several Canadian association and one American association (Montana) put a link to the Learning Nurse on their websites.
• We did presentations at two LPN conferences (British Columbia and Manitoba); presentations were well received and these two provinces provide traffic to our website.
• We did a mailing, that included a letter and brochure, to Chief Nursing Officers (CNO) at 800 American hospitals; this resulted in no responses or increases in website traffic.
• We did a mailing, that included a letter and brochures, to 400 in-service education co-ordinators in USA hospitals; we did not see any positive effects.
• We have distributed thousands of brochures through LPN Colleges in Canada; we have seen some increased traffic from these provinces.
• We did a mailing to all CEOs of the health regions in western Canada; we did have some inquiries including one in Saskatchewan that requested brochures for all their nurses. This district is now one of the biggest users of the Learning Nurse website.
• We practice SEO (search engine optimization) for the website and now include META tags for all the quizzes so they can be found via search engines; we also make sure that there are links on our quizzes so that users can be directed to the Learning Nurse website from any quiz they find through a search engine.
• SEO has worked to some extent as Learning Nurse is listed at the top of any searches for “nursing quizzes” or “nursing quizzes online”. However, as indicated previously, search engines account for only 12% of our overall traffic.
• We talk about our Learning Nurse website on various training and quiz software forums; this does bring in some traffic but is probably from other training companies and not nurses.

• We have upgraded our Learning Nurse Newsletter and now post it on our website; we send out a notification to a mailing list that includes nursing organizations and nursing programs at post-secondary institutions in Australia, Canada, New Zealand, United Kingdom and the United States. By providing useful and valuable information (statistics, articles and research findings, and not just hype), we hope to win over a few converts that will help us promote our service.

• We plan on regularly analyzing our quiz and personality diagnostic results, preparing short reports and sharing these with the nursing associations and educators via our newsletter and website. The expectation is that these will be reprinted or reposted in their organizations’ publications and thus increasing awareness among nurses.

• Finally, we have created a Twitter account for Learning Nurse, e.g., http://twitter.com/learningnurse We use Twitter to provide timely updates on additions and enhancements to the website and its resources. We are closely following the Tweets from other nurse related organizations and make them aware of our resources as appropriate.

Although the numbers of nurses and nursing students using the website is steadily increasing, we are a long way from the volume of traffic we can handle and would like to see. However, as our past experience with technology projects indicates, as long as we continue to provide quality resources and service, the traffic and usage will continue to increase.

Challenges and Issues

This initiative has faced some interesting challenges and issues. These include:

• Since this is strictly a self-funded initiative, and we do everything ourselves, there is limited time and resources to continue to add more content (especially e-learning modules).

• Because Steppingstones is a for-profit, private company, and because our initiative is global, we do not qualify for any funding from provincial or federal programs.

• Also, because we are a private company, we lack credibility and support among national, provincial and state nursing organizations.

• Although we take great care to ensure the accuracy of our learning materials, there is a concern about quality assurance.
• We are in the process of recruiting an advisory committee of nurses that will review the content and our developed resources. However, finding, recruiting and managing this nurse advisory committee is going to have its own challenges and costs.

• The promotion and marketing of the Learning Nurse website is expected to continue to be a challenge.

• We do not get enough feedback from the nurse users regarding priority content, design components, effectiveness, and usability of the website and its components / resources.

• Who will continue to operate, maintain and enhance the website after I am gone?

Despite these challenges, it is important to point out that at the end of each day, there are over a 100 nurses that are more competent in providing safe care to their patients / clients. Perhaps for now, this alone is a good enough reason to continue with this venture!

References

For more information about the Learning Nurse Resource Network, or LearningNurse.com, visit http://www.learningnurse.com

Our other related websites are http://www.quizreporter.com and http://www.competrax.com

For more on Steppingstones, please see our corporate website at http://www.steppingstones.ca