<u>Design and Development of a Computer Based Instructional Product</u>

Submitted to:
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I Needs Assessment

Maxim Healthcare is a leading provider of a diverse range of home health care, medical staffing and wellness services nationwide. Their largest division Maxim Healthcare Services is a leading source of quality clinical personnel for thousands of medical facilities. Employing an ever-increasing number of clinicians, they provide aid of many hospitals, nursing homes, school systems, correctional facilities and other medical environments across the nation. Clients rely on their expertise, dependability and quality personnel. The company succeeds by its ability to provide high quality care thru recruiting, retaining, and training of clinical healthcare providers in a highly competitive industry environment dominated by cost pressures and high field employee turnover.

The Wilmington office serving primarily New Hanover County, in accordance with industry regulatory requirements is responsible for insuring and validating that all personnel who perform nursing activities are competent in various medical procedures and that ongoing review training in these procedures is offered, encouraged, and certified in a system of ongoing competency testing.
Continued competence is the ongoing application of knowledge and the decision-making, psychomotor, and interpersonal skills expected of the licensed nurse within a specific practice setting and consistent with his/her practice role in providing, or assuring the provision of, nursing care in a manner which contributes to the health and welfare of the clients served

Currently some basic required review training and competency testing is done at new employee orientation, while other more specific training/assessment is done periodically dependent on specific nurse/client needs. All current training is performed individually or in small groups at the company office conference room using text based manuals along with limited company supervisor facilitation. The company typically orients approximately 200 nurses per year and has 50-100 on staff at any given time. (Its important to note all nurses hold either RN or LPN degree, which indicates they have at some point received in depth training specific to the topic at hand and have demonstrated prior learning capabilities at an advanced level.)

To this end, Ms. Rebecca Malik (Director of Clinical Services- Wilmington) who overseas Maxims nurse training, would like to add a competency review training and assessment program specific to a critical nursing function for the new hire orientation process for all nurses. This function involves the knowledge and skills needed to care for patients suffering various forms of seizures **(Seizure Management).**
Currently this review training is provided to a few specific nurses who have patients who are chronic seizers. The instructional review is delivered by a text manual in office setting and assessment is done by Ms Malik via brief random verbal questioning.
Ms. Malik would like to expand and improve this review training and competency assessment to include all nurses at their initial hiring orientation.

Audience Analysis:

Three different sources of information relative to learners was used to develop this analysis:

1. Interviews with client trainers and supervisors.
2. Interviews with client nurses.
3. Published research on learning preferences of medical professionals.
    ("Distribution of Learning Styles and Preferences for Learning Among Medical Care Assistants- Anthony Campeau, Ontario Ministry of Health. Feb 1997,)

Summary of findings were:

Learners are predominantly female ages 22-50 all of which have either LPN or RN degree. In addition all nurses have worked at least one year in a Medical/Surgical Hospital environment. Nursing experience varies greatly as does personal background and prior learning characteristics. There is a generally positive attitude towards continued education training however nurses having been exposed to current training methods expressed an equally strong dislike for the current delivery method and basic content orientation.

Criteria	Status	Source
Entry behavior	General knowledge: Fundamentals of nursing .	RN, LPN degree. Minimum1yr hospital exp. Pre-hire testing.
Prior knowledge of topic	Specific topic related knowledge: sterility procedures, terminology, and documentation.	Pre hire testing
	Seizure management skills taught in nursing school. Post school actual related experience varies significantly	Interviews
Attitude towards company	Generally favorable. High turnover profession.	Interviews Turnover statistics
Attitude toward content	Generally favorable- sees personal and professional benefit to content.	Interviews
Attitude toward current del system	Poor – Current system viewed as ineffective and unexciting. Does not match different learning styles, Linear format doesn't allow for selective topic learning. Some have prior CBI exposure.	Interviews / Research
Motivation	Generally positive attitude towards learning, but negative towards in office text based training modules. (ARCS model important to new instruction.) Competency testing as part of new hire orientation is required**.**	Interviews
Ability level	All have degrees/demonstrated learning skills.	
Attitude towards	Continuing education required for all nurses –most	Interviews

training	have prior experience with self-learning and instructor led Cont. Ed. learning. Generally favorable towards training if content relevant and delivery method effective and stimulating.	
Learning style Preferences	Typically prefer hands on "active experimentation" as opposed to theoretical. Enjoy learning individually or in small groups. Prefer learning options available through Multimedia.	Interviews / Research
Technology	Have basic computer operation and web browsing skills.	Interviews

Technology Analysis:

Context analysis sources included several trips to office, observation of current instruction and observation of actual performance
Training takes place in a relatively small office conference room with located at company office where learners frequently come for various purposes. The conference room currently lacks a PC but The Division Mgr. has agreed to install a PC with high speed internet in the conference room along with all necessary software to support new learning computer based modules. Interviews with nurses and staff as well as prior experience with this group indicates a significant variation in computer skills as well as home access.

Context analysis:

Competency reviews are conducted on an individual basis during office hours at a pre-scheduled time in accordance with learners schedule. Learners are not paid for this time but understand required for continued employment. During these reviews, the conference room door is open and learner is subject to some minor distractions. A delivery method of instruction, which can be done in a quiet undisturbed setting either in the office or at remote locations like nurses home is needed.

Performance Objectives:

Performance objectives have been grouped into 4 distinct terminal objectives in order to provide some grouping for self-assessment and distinction of learning tasks.
   Demonstrating what a seizure is;
   Demonstrating different causes;
   Classifying the different types of seizures and their symptoms
   Demonstrating what to do when seizures occur.

The post-test and (ultimate competency evaluation) is based on learner being presented with multiple choice questions which will be automatically scored to determine skill level and subject knowledge.

Media analysis:
Considering the wide range of learning styles and visual nature of the performance objectives, both text and heavy use of graphics are needed. Audio video also would be extremely useful. However given the limitations of time and money for this project as well as need to perform on a variety of computers (nurses homes) which may be outdated, video was left off.

Cost analysis:
The realizable cost savings in terms of people's time is significant. Training 200-300 nurses using the current individual assessment method is nearly impossible for the staff. A CBI module with objective based assessment that is integral to the module will alleviate this problem. In addition, the nurse's time needed to come to the office without pay to perform self-training is both a cost and motivational issue. A self-learning module that can be used in many environments at their convenience is a major plus.

Need Analysis Summary:

Two key issues emerge:
1. In order to expand this review instruction and assessment to include all nurses at orientation the current system of in office text manual reviews followed by individual interviews must be changed to improve effectiveness and efficiency.
2. Both supervisors and nurses feel the current text based manual method of delivering instruction is ineffective, not motivational, and doesn't meet different styles of learning.

Criteria	Is	Should be
Instructional Setting	Office conference room table.	Conference room with isolated PC workstation or in remote setting
Instructional Tools/ Delivery system	Text based linear procedural manual	Non-linear, learner choice, Multiple learning style computer based instructional module
Assessment	Verbal random questions	Objective based multiple choice with capacity to self-score.
Current learners	Approx 20 nurses	All (200-300) nurses
When	Upon patient assignment	At initial hire orientation
Content	Limited and dated aspects of seizure care	Individual learning module focused on specific knowledge and skills.

II Design

Design of the CBI centered on several factors uncovered in the needs assessment.

1. These are adult learners who need to be engaged and motivated. Following the ARCS theory of motivation certain features were built in.
   - At the start, they are stimulated by the CBI capturing and using their name.
   - In the introduction, they are presented with a statement of responsibility as a nurse to be competent in their skills along with facts evidencing potential to need seizure management skills. Both of these are designed to indicate relevance of the learning at hand.
   - Help is provided for those lacking computer skills in terms of navigation as well as aids to help them develop confidence as they go and become satisfied with their ability to navigate the CBI.
   - Many self-tests are imbedded on the module after small chunks of content. In addition the early self tests in the sequence are relatively easy, again designed to build confidence and satisfaction.

2. The concepts of consistency and cognitive distraction were critical to the design stage.

   - A uniform page layout was developed and used throughout the module. Placement of all navigational tools as well as topic headings and color scheme remain constant. Blue screen borders focus the learners away from the navigational tools and into the content.
   - All action items are consistently provided in a green font with the learners told up front. They don't have to search for different icons to access further content. The design is relatively simple yet functional which meets the needs of learners with a variety of skill levels.

3. As adult learners, certain design features are critical.

   - They are provided with a navigation scheme, which allows for information on demand within the confines of chunking content and self-assessment around the four learning objectives. They can explore at own pace and direction, however are told up front of a final skills assessment based on the learning objectives, which are also presented in the introduction.
   The navigation scheme involves a linear introduction section leading to the tutorial start. From there they select o content unit hub, which branches off into more content and self-assessment. It is Non-linear with the idea of exploring the sub learning tasks for each learning objective in depth, before moving to the next.

Upon completion of the content, learners enter a final assessment, which is blocked form reentry to content.

- Information is presented in a manner that requires them to be engaged and actively seeking content. Examples include toggling on pages to see different features and presentation of graphic representations as an extra available item for text.

4. The large number of potential users represents a significant variation in learning styles, which must be accommodated. Use of text and many graphic representations are integral. If time and budget had allowed more multimedia should have been included. This will be added later.

5. Gagnes theories of instructional events and conditions of learning were followed for effective learning.

- The module is designed to present content grouped into the 4 terminal objectives with an entry point aimed at gaining attention with presenting NC board of nursing rules as to nurses responsibilities and liabilities as well as an information on the high rate of seizures and their likelihood of being exposed.
- Learning objectives are presented up front as well as awareness of final assessment.
- Content material is presented engaging the learners to seek more wherever possible. Symbols and structure are used to imply sequencing of learning and events.
- Imbedded assessments are available after small chunks of content with immediate feedback provided.

III Development

The stages of development were:

1. Creation of a storyboard, which represented the terminal and sub terminal learning objectives. These were reviewed with the SME.
2. Accessing information both in graphic and text form. The SME provided much of the basic textual information and graphics were obtained from various sources with permission received where needed.
3. Basic outline of the Instruction including content breakdown, graphics and text for each was reviewed with several client nurses. Some changes were made in sequencing.
4. First draft of actual CBI was produced and again reviewed by client nurses. Several issues were exposed and changes made.
5. Second draft was reviewed by Dr. Murdock, with primary issue of faulty navigation exposed. Changes were made to eliminate linear navigation aspect and also page layout was made more consistent and user friendly

6. Next draft submitted to Dr. Murdock 5/1/04 for grading.
7. Continued development will include addition of audio and perhaps some video. Drafts will be produced for final review by 6/1/04.
8. Final products will be introduced to the client for use on a widespread basis and follow up survey will be conducted to assess effectiveness of product in meeting the learning objectives as well as dealing with the learner motivation and logistical issues uncovered in needs analysis.

IV Project Reflection

In producing this computer-based instruction, I was able to combine much of my prior learning involving instructional theories and models with new technology skills to produce a relatively effective product. I also developed an understanding of the many different tasks and skills required to produce a really good CBI tutorial. This will provide a basic understanding of the specific talents needed from a project team as well as the sequence of events involved in the design and development stages.