

NATIONAL NETWORK OF LIBRARIES OF MEDICINE®

Response to the Request for Proposal NLM-10-055-AN

NATIONAL LIBRARY OF MEDICINE® TRAINING CENTER TECHNICAL PROPOSAL

APRIL 4, 2011

Submitted on Behalf of

**University of Utah
Spencer S. Eccles Health Sciences Library**

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National Library of Medicine Training Center Technical Proposal

Part 1: Mission, Goals and Service Plan

Introduction

MISSION AND GOALS

The mission of the National Network of Libraries of Medicine® (NN/LM®) is “to advance the progress of medicine and improve the public health by: 1) providing all U.S. health professionals with equal access to biomedical information; and 2) improving the public’s access to information to enable them to make informed decisions about their health.” The National Library of Medicine® (NLM®) Training Center (NTC) supports the mission of NN/LM.

The Spencer S. Eccles Health Sciences Library at the University of Utah proposes to become the National Library of Medicine Training Center for the period 2011-2016. The goals we have set forth for the NTC are:

- To support the effective use of NLM information products and services by health sciences librarians, public librarians, health professionals, and the public health workforce; and
- To provide leadership to the NN/LM regions related to e-learning delivery methods and instructional best practices for adult learners.

NTC activities are coordinated by NLM and are carried out through the NN/LM health sciences institutions.

THE NATIONAL LIBRARY OF MEDICINE TRAINING CENTER SERVICES PLAN

The NTC was formerly named the National Training Center and Clearinghouse (NTCC) and was located at the New York Academy of Medicine (NYAM). The NTCC originally focused on developing and delivering in-person classes for health sciences librarians at locations nationwide. In the 2006 - 2011 contract period, NTCC experimented with distance learning but focused primarily on in-person classes.

Increasingly, providing training electronically via the Internet, i.e., providing “e-learning,” has become a necessity. Due to time constraints and diminishing travel budgets, many health sciences librarians and health professionals can no longer travel to one location to attend all day training sessions. Busy professionals need access to “anywhere, anytime” training and “just-in-time” tutorials to help them learn how to access and effectively use NLM products and services. E-learning allows learners to access tutorials or archived “webinars” (web-based seminars) as many times as necessary to absorb the material.

Technology improvements such as increased bandwidth, faster processors, and the availability of low-cost video and audio systems have made it possible to successfully deliver both asynchronous and live, synchronous training to participants regardless of their geographical locations. New authoring tools make it possible to rapidly create high quality “just-in-time” learning materials so that users can learn about changes to products in a timely manner.

All training offerings, both in-person and online, must reflect the needs of adult learners. Adult learners want practical, relevant, engaging, and motivating training that adheres to instructional design best practices.¹ Assessing the skills and knowledge gained by students as a result of any training is a key function of the training process.

The continuous cycle of plan-act-observe-reflect is not only a model used to effectively design curriculum but also a model for creating and implementing the NTC program. We will use a logic model as a roadmap, a systematic approach to articulate the goals, objectives, activities and desired outcomes of the NTC. (See Appendix A for the logic model).

The Service Plan, developed by the Spencer S. Eccles Health Sciences Library, is described in detail based on the National Library of Medicine Training Center section of the Statement of Work for NLM-10-055-AN, NN/LM Services, issued on March 5, 2010. For each component of the program, we have included:

- The Statement of Work section or sub-section;
- Objective: from our experience using logic models with the NN/LM MidContinental Region, we find that objectives work best if they are broadly defined. Our objectives are the “why” statement that drives our program and contributes towards reaching the goals of the NTC;
- Rationale: an explanation of why the work is important;
- Approach and Methodology: descriptions of how we will carry out the work;
- Outcomes: anticipated or desired measurable change in status, behavior, knowledge, skill, or awareness;
- Performance Measures: methods to measure our success;
- Schedule: a listing of when program activities will take place.

¹ Knowles, Malcolm S., Elwood F. Holton III, and Richard A. Swanson (1998). The Adult Learner. Houston: Gulf Publishing.

CHALLENGES

The NTC will face a number of challenges in the 2011 - 2016 contract period:

- Meeting the learning needs of health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of training mechanisms, including in-person classes and e-learning opportunities.
- Efficiently and effectively creating, maintaining, and updating self-paced tutorials and “just-in-time” training materials related to NLM’s products and services.
- Keeping pace with changes and new developments in a wide range of disciplines: NLM products and services; new technologies and e-learning delivery methods; research related to adult learning and instructional design; and instructional assessment methods.
- Providing access to an up to date database of re-usable educational materials developed by the staff of NN/LM and their Network members.
- Ensuring that training activities are continuously monitored and improved based on feedback from training participants, NLM and the NN/LM.

The Eccles Health Sciences Library will meet the challenges for the 2011 - 2016 contract period by:

- Expanding the NTC training offerings to meet the needs of a larger number of learners through a variety of delivery methods: in-person classes; blended classes with both in-person and e-learning instruction; e-learning classes using a hybrid format of live sessions and asynchronous activities; web-based self-paced tutorials; re-usable learning objects; and “just-in-time” short screencasts.
- Increasing the reach of NTC offerings to include health professionals, public librarians, and the public health workforce in addition to health sciences librarians. The health sciences librarian “train-the-trainer” model will remain the primary focus of the NTC, but we will reach out to other groups that do not have access to training at health sciences institutions.
- Disseminating information to the NN/LM related to developments in e-learning techniques and delivery methods, as well as research related to adult learning and instructional design.
- Coordinating with the Medical Library Association (MLA) and the NN/LM Regional Medical Libraries (RMLs) to ensure that educational materials

developed by the NN/LM and its member libraries are accurately reflected in the MLA Educational Clearinghouse (<http://cech.mlanet.org>), and promoting the Clearinghouse to the NN/LM.

- Developing effective assessment and evaluation instruments to improve NTC services and activities. This will include student assessments (satisfaction questionnaires, skills and knowledge assessments, and follow-up behavioral change evaluations) as well as feedback from the Regional Medical Libraries (RMLs) through questionnaires and focus groups.

THE ECCLES HEALTH SCIENCES LIBRARY

The Eccles Health Sciences Library has been a leader in the use of new technologies for delivering instruction for many years; projects include computer-based tutorials using analog videodiscs (1985-2005), web-based tutorials (1993-present), and web-based multimedia digital repositories (2000-present).

The Eccles Health Sciences Library has been a Regional Medical Library for the NN/LM MidContinental Region (MCR) since 2001. During that time the MCR pioneered the use of technology to deliver instruction to the region. The MCR first began to offer live regional updates with a University of Utah license for Adobe Connect (formerly Macromedia Breeze). The early experiences with the technology allowed MCR staff to develop “best practices” for successfully holding a meeting or offering a class using Connect. The NIH license for Adobe Connect became available in 2005 and further streamlined the participant’s experience through the use of a telephone conferencing system for the audio delivery. MCR’s use of Adobe Connect for meetings and training is now routine; MCR offered over 130 classes and presentations through the technology from May 2006 – March 2010.

MCR also adopted an open source course management system called Moodle for asynchronous classes. Several multi-week classes, including “Thinking Like An MBA,” and “13 Things: Web 2.0,” are offered to the region using Moodle. Students access the class materials at whatever time is convenient for them. Most recently, MCR staff is offering “hybrid” classes using Adobe Connect for live demonstration sessions and Moodle for class interaction and hands-on participation. The hybrid classes have resulted in increased class interactivity.

As the NN/LM for the MidContinental Region, the Eccles Library fully implemented the distributed model concept and pioneered the delivery of NN/LM and NLM services with RML coordinators located at each of the region’s Resource Libraries. The RML also shares a position with the Pacific Southwest Region (PSR); the MCR Technology Coordinator is located in Salt Lake City and works remotely with PSR staff. The Eccles Library is in a centrally located time zone, allowing convenient collaboration with other

time zones from Hawaii to the East Coast. The Salt Lake City International Airport is a hub for Delta Airlines and a major stopover for other large airlines, making it convenient to reach destinations across the United States.

The Director of the Eccles Library served as the President of the Medical Library Association (MLA) in 2006-2007 and as co-principal investigator of the MLA/NLM Health Information Literacy Research Project that was conducted from 2006-2008.² Through this project, multiple formats for instructing health sciences librarians and health care providers about health information literacy were developed and the curriculum tested with over 2,000 individuals. A combination of in-person trainings using scripted PowerPoint presentations, regional webinars using Adobe Connect, and online tutorials using the course management system Moodle were created to deliver the curricula. Knowledge gained and behaviors changed as a result of the instruction were assessed. The lessons learned from this project will be applied to NTC training offerings as the NTC explores the use of multiple instructional methodologies for delivering content to in-person and distance learners.

The NTC leadership team will comprise a Director with over 5 years of RML and 30 years of health sciences library experience, an Associate Director with over 10 years of experience in RML leadership and administration and an Assistant Director with over 24 years of experience in creating computer-based instructional materials and over 6 years of experience delivering classes via distance technologies. The Assistant Director worked with health sciences faculty to create computer-based learning materials beginning in 1986, and will apply the lessons learned and best practices developed over those years to effectively manage the development of e-learning materials for the NTC. She has also taught e-learning classes for MCR since 2004, when the technology was in its infancy; her e-learning classes consistently receive excellent assessments from the students who participate. She has also taught e-learning classes for the Pacific Southwest Region (PSR) since 2007. She will use the experience gained to ensure that NTC distance classes are engaging and student-focused.

The Eccles Library will complement the strengths of the leadership team by hiring two trainers from the NYAM NTCC with extensive training experience. These trainers have demonstrated their dedication, flexibility, and determination to respond to the challenges that come from a national travel schedule and a rapidly changing information environment. Further, these trainers are among the most experienced and effective trainers of PubMed®, NLM Gateway, ClinicalTrials.gov and TOXNET® in the United States; their motivational teaching style and engaging interaction as a team have been noted in evaluations they receive from learners. A colleague familiar with their teaching recently stated that they are “knowledgeable and effective instructors, with a great

² Shipman, J.P., et al. “The Health Information Literacy Research Project.” *J Med Libr Assoc.* 2009 October; 97(4): 293–301. PMID: PMC2759165

sense of participants' needs and a phenomenal means of knowledge transfer." They have also developed excellent working relationships with the NLM staff, both at MEDLARS Management Section (MMS) and the Division of Specialized Information Systems (SIS).

The NTC team will also include an instructional design expert from the University of Utah Technology Assisted Curriculum Center (TACC). The mission of TACC is to support University of Utah faculty, instructors and students with technology-enabled course design, development and delivery services, and to collaboratively connect people and instructional technologies for effective, efficient education.

GUIDING PRINCIPLES

In developing the Services Plan for the National Library of Medicine Training Center, we have been guided by two encompassing principles:

- *Engagement with the RMLs, Centers and MLA:* Engagement with the NN/LM RMLs/Centers and MLA is a guiding principle of the NTC. We are committed to working in collaboration with the RMLs to respond to specific regional training needs and to participating in RML meetings and activities. We will also regularly solicit feedback from the RMLs to inform improvements in NTC activities and services. The NTC will closely collaborate with the Outreach Evaluation Resource Center (OERC) and NLM to create effective assessment and evaluation instruments. We will work with the Web Services Technology Operations Center (Web-STOC) to ensure an attractive and easy to navigate web site and class registration system. We will work with MLA and the RMLs to monitor the accuracy and improve the usability of the MLA Educational Clearinghouse.
- *High-tech, high-touch:* The Eccles Library and MCR believe in the importance of balancing "high tech" and "high touch." We use technology as a tool to reach a large number of Network members in an efficient and cost effective manner, but we also strive to balance this with personal interaction. We often find that in-person encounters at conferences or meetings occur because people "know" us after having attended a class via the Internet. We use technology as a tool to foster relationships and collaboration as well as to promote NLM services and products.

The Spencer S. Eccles Health Sciences Library is uniquely qualified to become the National Library of Medicine Training Center. We have assembled a team with complementary skills and experience; the team has demonstrated success in offering in-person classes related to NLM products and in creating and delivering e-learning instruction. We will ensure that the NTC is responsive to the changing needs of learners and the rapid adaptation of new technologies during the 2011 - 2016 contract period.

Statement of Work #1

Statement of Work

The contractor shall create e-learning products for users of NLM systems. The products will be a combination of live training sessions (e.g., “Webinars”), and Web-based self-paced tutorials. Specifically, the contractor shall undertake the following:

- a. Collaborate with NLM to identify topics to cover and learning objectives. Training in the following NLM resources, or some combination of these resources, will be offered:
 - i. PubMed
 - ii. NLM Environmental Health and Toxicology databases
 - iii. NCBI databases
- b. Submit drafts of all e-learning products (e.g., outlines, storyboards, wire frames) for NLM review and approval prior to production;
- c. Submit all raw development files (e.g., .fla, .cp, .qvp, .cam files) used to create the products with the production files to NLM;
- d. Schedule live e-learning events in consultation with NLM;
- e. Register all students for live e-learning events;
- f. Record all live e-learning events for posting and archiving;
- g. Maintain and update self-paced products;
- h. Design and conduct student knowledge and skills assessments for each product using a collection and reporting system approved by NLM (e.g., ViewletQuiz; SurveyMonkey). NLM must review and approve assessment tools prior to use by the contractor;
- i. Design and conduct assessments of student satisfaction with each training product;
- j. Provide NLM with any relevant raw data not submitted to the reporting system, and a summary report of the training activity within two weeks following each live e-learning event.

Objective & Rationale:

Objectives:

In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods.

Rationale:

At the simplest level, E-learning is defined as “using technology to deliver learning and training programs” (<http://www.e-learningguru.com/gloss.htm#E>).

E-learning includes synchronous or asynchronous instructional offerings, electronic self-paced tutorials, or shorter “just-in-time” modules designed to be used at the moment of

need. E-learning technologies allow participants to receive instruction from their home or office computers.

WHY E-LEARNING?

The following six factors are indicative of why the NTC should and will embrace e-learning:

1. Improving performance: A recent meta-analysis conducted by the U.S. Department of Education looked at studies over the last 12 years that compared online education with in-person courses.³ The findings showed that students in higher education who took all or part of their instruction online performed better, on average, than those taking the same course through in-person instruction. “Blended” classes, which included both online learning and in-person instruction, produced the best results, most likely due to increased instruction time.
2. Increasing access: In-person classes require learners to find time and funding to travel to a particular location. Even if the training is in their home city, there are many learners who, due to staffing levels at their institutions, cannot get away for an entire day or even part of a day to take classes. Asynchronous e-learning opportunities allow professionals to access course materials at any time from their office or home computers, and to participate for shorter bursts of time as is convenient for their schedules. Even though synchronous e-learning requires participants to schedule within a particular time period, they can benefit by accessing the class from their current location. Each synchronous session is typically less than two hours in length at one time, so participants do not have to “give up” an entire work day.
3. Increasing capacity: While in-person class attendance is limited to the number of computers available in a training lab, e-learning classes can be offered to a greater number of students, constrained only by the amount of time available to the trainer(s) to conduct the course. Self-paced tutorials and just-in-time modules can be accessed by an unlimited number of learners.
4. Saving funds: E-learning saves on travel costs for both trainers and learners and is more eco-friendly.

³“Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies,” U.S. Department of Education Office of Planning, Evaluation, and Policy Development Policy and Program Studies Service, May 2009, Accessed from <http://www.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>

5. Sustaining adult learning styles: Adults want self-directed learning relevant to their professional activities. Adults learn at different speeds; e-learning opportunities allow them to take as much or as little time as needed. Learners can access tutorials or archived webinars as many times as necessary to absorb the material.
6. Responding to the stated needs of NN/LM Network members. The Pacific Southwest Region sent a questionnaire to Network members in October 2009. Out of 162 respondents, 114 (70%) indicated that they would like to see more training offered through distance education. MidContinental Network members have expressed this need in feedback given during the 2009 NLM site visit, focus groups, and informally. We believe that other regions' members reflect this need as well.

E-LEARNING STRATEGIC PLAN

The issue of e-learning is multi-faceted. The following six elements will contribute toward the Eccles Library NTC e-learning strategic plan:

1. Delivery Methods

E-learning delivery methods include:

- Synchronous “live” sessions offered over the web at a particular date and time;
- Asynchronous classes offered through a course management system; and
- Self-paced tutorials available on the web or on mobile devices.

E-learning can be blended, using a combination of delivery methods or can be offered as part of an in-person class.

NN/LM MCR has successfully offered “hybrid” classes that combine synchronous live sessions using the Adobe® Connect™ web conferencing system with assignments and discussions taking place through Moodle, a course management system that is a free Open Source software package. The Moodle component of the classes adds to the level of interactivity and “bonding” among the participants. Often the students learn as much from each other as from the trainers.

2. Delivery Channels

To reach a wider audience and add feedback opportunities, we will publish e-learning products on iTunesU and YouTube. Health sciences departments at the University of Utah that publish content on iTunesU include the College of Nursing, the School of Medicine, and the Department of Bioinformatics (<http://itunesu.utah.edu/>). An example

of a short TOXNET tutorial is currently available on YouTube (<http://www.youtube.com/watch?v=OSaLmHlwbiE>). While this video can be improved in terms of presentation and content, it provides an example of what is possible in the YouTube format.

iTunesU is appropriate for longer form content while YouTube has length limitations. The advantages of publishing on both iTunesU and YouTube include:

- Reaching additional users who may not know about or visit the NLM or NN/LM web site; these users may find the content through a YouTube or web search;
- Offering an informal mechanism for users to provide feedback and a “social networking” component so that users can recommend the resource to others; and
- iTunes users can download audio and video files for later playback when they are off-line.

3. Re-Usable Learning Objects

“Learning objects” are defined as “web-based interactive chunks of e-learning designed to explain a stand-alone learning objective.”⁴ Learning objects can also be thought of as shareable, modularized educational content.⁵ Re-usable learning objects have the following characteristics:

- “Chunked” and self-contained: learning objects include content and activities designed to support a particular learning objective. They can stand by themselves or be incorporated into a larger course.
- Portable: learning objects can be imported into a course management system for use in a larger course.
- Described by metadata: learning objects have descriptive metadata so that they can be retrieved from learning object repositories.

Learning object repositories include MERLOT (Multimedia Educational Resource for Learning and Online Teaching), a repository of free learning materials designed for higher education (<http://merlot.org>); the WISC-Online (<http://www.wisc-online.com/>) learning object repository, which includes examples in health; and MedEdPortal (<http://services.aamc.org/30/mededportal/servlet/segment/mededportal/information>),

⁴ http://www.rlo-cetl.ac.uk/joomla/index.php?option=com_content&task=view&id=235&Itemid=28

⁵ Metros, Susan A. “Learning Objects: A Rose by Any Other Name...” *Educause Review*, July/August 2005, 40(4):12-13.

created by the American Association of Medical Colleges (AAMC) to house learning materials for health sciences educators. The NTC will submit learning objects that we develop to these repositories as appropriate.

Learning objects can be imported into course management systems such as Moodle through the Sharable Content Object Reference Model (SCORM) (<http://www.scorm.com/>) format. SCORM is a set of technical standards that allow learning objects to be imported into course management systems.

E-learning authoring tools, such as SoftChalk (<http://www.softchalk.com/>), export chunks of content to the SCORM format. For example, the SoftChalk web site has a sample lesson (http://www.softchalk.com/lb_examples.html) about eye anatomy that includes pop-up text annotations, interactive pop-up comprehension questions, flash cards and hotspot image activities. After importing the eye anatomy SCORM package into Moodle, all the content and activities retained their interactive features. This lesson and all of its interactive features could now be used as part of a larger Moodle course.

Creating content as a re-usable learning object in the SCORM format will allow trainers within the RMLs and elsewhere to incorporate this content into their own classes.

4. Mobile Learning

Few technologies are changing as rapidly and growing as quickly as mobile computing. The New Media Consortium's *Horizon 2010* Report placed mobile computing in its "1 year or less to adoption" category. The report points out that "Users increasingly expect anytime, anywhere access to data and services that not very long ago were available only while sitting in front of a computer linked to the network via cable networks."⁶ The report identifies three trends contributing to the growth of mobile computing:

- Continued growth in the variety of mobile devices, including "smart" phones such as the iPhone, Android phone platforms, and Blackberry; netbooks; and new touch screen devices such as the Apple iPad.
- The growth of wireless networks, many of them free, in more public places as well as businesses and institutions.
- New cellular networks that have faster speeds and are easy to access from a mobile device.

⁶ Johnson, L., Levine, A., Smith, R., and Stone, S. (2010). *The 2010 Horizon Report*. Austin, Texas: The New Media Consortium.

In 2009, Gartner Inc. identified the top 10 consumer mobile applications for 2012.⁷ Mobile search, browsing, and health monitoring were listed among the top 10. A recent California HealthCare Foundation reported that two-thirds of U.S. physicians own smartphones; the report listed a growing number of smartphone applications for continuing medical education, diagnosis of patient conditions, and access to electronic patient records.⁸

In underserved urban areas in the U.S., use of mobile devices has “leapfrogged” the use of traditional computers.⁹

The Horizon report gives a number of examples of universities that are exploring mobile learning in different ways:

- Offering content suitable for mobile devices;
- Using social networking tools that can be accessed on the mobile device for discussion and interaction; and
- Offering custom applications that perform a specific task.

NLM is offering mobile versions of several of its products, including PubMed (<http://www.nlm.nih.gov/mobile/>) and the Wireless Information System for Emergency Responders (WISER®) (<http://wiser.nlm.nih.gov/>). As more users shift to using mobile versions of NLM products, we believe they will expect training to be delivered on a mobile device platform.

5. Adult Learning

NTC e-learning opportunities will be designed to fit the characteristics of adult learners.¹⁰ Adult learners are typically:

- Autonomous and self-directed. E-learning classes should be designed to allow each learner to work at his or her own pace.
- Experienced and knowledgeable. Adult learners have an established base of experience and knowledge that will be applied to their learning. E-learning

⁷ “Gartner Identifies the Top 10 Mobile Applications for 2012.” Gartner, Inc. Press Release. Accessed from <http://www.gartner.com/it/page.jsp?id=1230413> on April 18, 2010.

⁸ “How Smartphones are Changing Health Care.” California HealthCare Foundation. Accessed from <http://www.chcf.org/~media/Files/PDF/H/HowSmartphonesChangingHealthCare.pdf> on May 10, 2010.

⁹ “To Be Young, Digital and Black.” Spotlight on Digital Media and Learning. Accessed from http://spotlight.macfound.org/btr/entry/to_be_young_digital_and_black/ on April 18, 2010.

¹⁰ Knowles, Malcolm S., Elwood F. Holton III, and Richard A. Swanson (1998). The Adult Learner. Houston: Gulf Publishing.

should use the “scaffolding” of previous knowledge to help students learn new skills.

- Goal-oriented. Adult learners know what they want to attain from a particular class. Classes and tutorials need to be organized and learning objectives clearly defined.
- Relevancy-oriented and practical. Classes should be designed with a great deal of hands-on practice and theoretical information presented so that it relates to the skills that students need to gain.
- Seeking respect. Adult learners expect to be treated as adults and feel as equals in the class. Classes should allow students to share their own knowledge and skills with others.

6. Instructional Design Best Practices

The ADDIE (Analysis, Design, Development, Implementation and Evaluation) is a widely accepted model that we will use in our development cycle (<http://www.grayharriman.com/ADDIE.htm>). The ADDIE development steps are:

- Analysis: Identify needs and constraints;
- Design: Define learning activities, assessment and media;
- Development: Produce, perform formative evaluation, and revise;
- Implementation: Deliver the instruction; and
- Evaluation: Evaluate results.

The NTC e-learning offerings will utilize instructional design best practices by applying ADDIE during the following three phases:

I. Analysis

In the analysis phase, the gap between the desired outcomes or behaviors and the existing knowledge and skills of the intended audience is identified. The analysis phase also identifies the characteristics of the learner as well as learning constraints (such as time constraints or lack of access to resources). The project timeline is developed during this phase.

Learning objectives are developed during this phase. Bloom’s Taxonomy is a commonly used method for designing measurable learning outcomes.¹¹ A learning objective should read: students will (*action verb*) (*something*) and

¹¹Anderson, L.W., et al. (Eds.) (2001). A Taxonomy for Learning, Teaching, and Assessing — A Revision of Bloom's Taxonomy of Educational Objectives. Addison Wesley Longman, Inc.

ideally (*to some degree of competency*). In collaboration with NLM, learning objectives will be written using the Bloom's Taxonomy methodology.

II. Design, Development and Implementation: Rapid Prototyping

For the design, development and implementation cycles of the ADDIE model we will utilize the rapid prototyping model (http://www.instructionaldesign.org/models/rapid_prototyping.html). In a design process, rapid prototyping refers to the early development of a small-scale prototype used to test key features of the design.¹² Rapid prototyping incorporates an iterative model so that learning products are continuously improved. Figure 1 shows the steps of this iterative cycle.

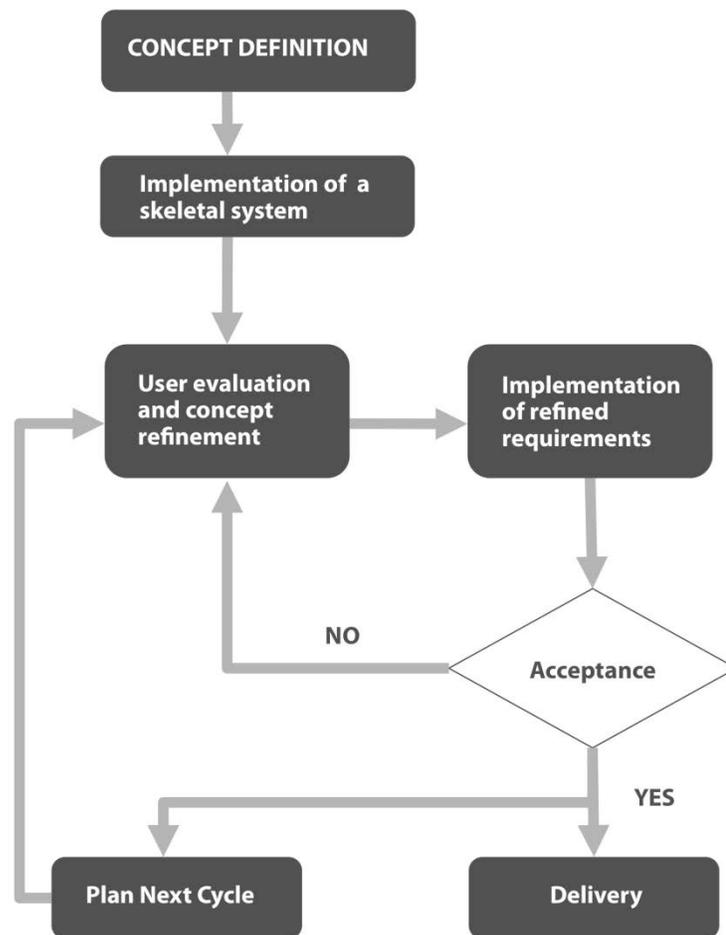


Figure 1. Rapid prototyping development cycle

¹² Wilson, B. G., Jonassen, D. H., and Cole, P. (1993). Cognitive approaches to instructional design. In G. M. Piskurich (Ed.), *The ASTD handbook of instructional technology* (pp. 21.1-21.22). New York: McGraw-Hill.

Rapid prototyping begins with “low fidelity” instruments such as paper and pen, and moves to higher fidelity prototypes using storyboards, wireframes and ultimately, a functioning computer-based tutorial.

III. Evaluation

The Kirkpatrick model will be used to plan an evaluation strategy for both e-learning and in-person learning opportunities.

The Kirkpatrick Model, a classic in the industry, is a framework for evaluating learning outcomes.¹³ The model is divided into four levels:

- Level One: Reaction – Student satisfaction, i.e., “did they like it?”
- Level Two: Learning – Skills and knowledge assessment via a pre-test/post-test assessment.
- Level Three: Transfer – Assessment of whether skills and knowledge were applied to jobs.
- Level Four: Results – Business results or return on investment (such as increased production, improved quality, or decreased costs).

To assist the NTC in designing the assessment instruments, we will utilize the Flashlight network. The Flashlight model is designed to help evaluate whether e-learning technologies contribute to principles of good practice in education.¹⁴ The model focuses on evaluating e-learning activities, the outcomes expected from that activity, and the technology used for the activity. To that end, the Flashlight network of higher education institutions has created the Flashlight toolkit. The toolkit contains 500 questions that can be used to create student assessment questionnaires.

By joining the Flashlight network, the NTC will be able to adapt questionnaires in the Flashlight database for use within NTC e-learning assessments. The questions include items related to active learning, collaborative learning, faculty-student interaction, time on task, expectations, engagement, learning outcomes, and the incorporation of real-world problems in the training. We will work with NLM and the NN/LM Outreach Evaluation Resource Center (OERC) to adapt the questions for assessments of the NTC self-paced tutorial products.

¹³ Kruse, Kevin. “Evaluating e-Learning: Introduction to the Kirkpatrick Model.” Accessed from http://www.e-learningguru.com/articles/art2_8.htm on April 2, 2010.

¹⁴ Flashlight Program. Accessed from <http://www.tltgroup.org/flashlightP.htm> on April 18, 2010.

Outcomes:

- Class participants develop the skills and knowledge needed to improve access to biomedical information.
- Learners receive instruction related to NLM products and services using the delivery method that best fits their needs.
- RML trainers utilize re-usable learning objects created by the NTC in their online training.
- E-learning instructional offerings are accessible to learners with disabilities.

Approach and Methodology:

1. The contractor shall create e-learning products for users of NLM systems. The products will be a combination of live training sessions (e.g., “Webinars”), and Web-based self-paced tutorials.
 - a. Collaborate with NLM to identify topics to cover and learning objectives. Training in the following NLM resources, or some combination of these resources, will be offered:
 - i. PubMed
 - ii. NLM Environmental Health and Toxicology databases
 - iii. NCBI databases

E-LEARNING STRATEGY OVERVIEW

We will develop an e-learning strategy that offers learners a variety of delivery methods for receiving instruction:

- Online classes using a “hybrid” approach: live web conferencing using Adobe Connect combined with self-paced hands-on exercises and discussion forums delivered via Moodle. The hybrid classes will be offered at particular times during the contract year, with deadlines set for completing the exercises;
- “Webinars” (live events);
- Self-paced web-based tutorials, which students may complete at any time;

- Mobile device e-learning opportunities; and
- “Blended” classes, which are defined as a combination of in-person and online classes (see Statement of Work #2).

We will develop and deliver e-learning training opportunities related to the following resources:

1. Clinical Trials.gov
2. NLM Gateway
3. PubMed
4. NLM Environmental Health and Toxicology Databases
5. NCBI databases

We will collaborate with NLM staff to identify e-learning topics to be covered, develop learning objectives for those topics, and utilize appropriate delivery formats. We will work with NLM to develop the live e-learning events schedule, and will register students using the NTC class registration system (see Statement of Work #8).

For all e-learning offerings, we will ensure:

- Adherence to best practices for instructional design and adult learning needs;
- Compliance with Section 508 accessibility requirements;
- Sound assessment and evaluation methods, developed in conjunction with the Outreach Evaluation Resource Center (OERC) and NLM;
- The availability of an archived version following each e-learning live event. The archived version will meet Section 508 requirements.

HYBRID DISTANCE EDUCATION CLASSES

In collaboration with NLM, we will develop and deliver hybrid e-learning events including classes related to PubMed, TOXNET, NCBI databases, and NLM Gateway and Clinical Trials.

Hybrid classes are a combination of live, synchronous “webinars” and asynchronous course work (exercises, assignments and discussion). NIH and NN/LM provide access to two delivery platforms that we will use initially to deliver hybrid classes:

- Adobe Connect: Adobe Connect is a web conferencing tool available through NIH at no charge to NN/LM. Features include: screen sharing display, including

PowerPoint presentations or display of any application on the trainer's computer; audio through Voice Over IP or integrated with a telephone conferencing system; video conferencing using low cost webcams; meeting recording; chat box for entering text messages; whiteboard; polling option for receiving feedback from students; and breakout rooms. See Figure 2 for a screen shot.

- Moodle: Moodle is an open-source course management system available to NN/LM through Web Services & Technology Operations Center (Web-STOC). Using Moodle, the trainer can organize all of the relevant course materials and assignments for students to access at any time. Students can post questions, thoughts about readings, and results of hands-on exercises in Moodle's discussion forums. Re-usable learning objects packaged as SCORM objects can be imported into Moodle. See Figure 3 for a screen shot. For increased student convenience, the MLE-Moodle plug-in (<http://mle.sourceforge.net/>) allows Moodle users to access course work through a mobile phone.

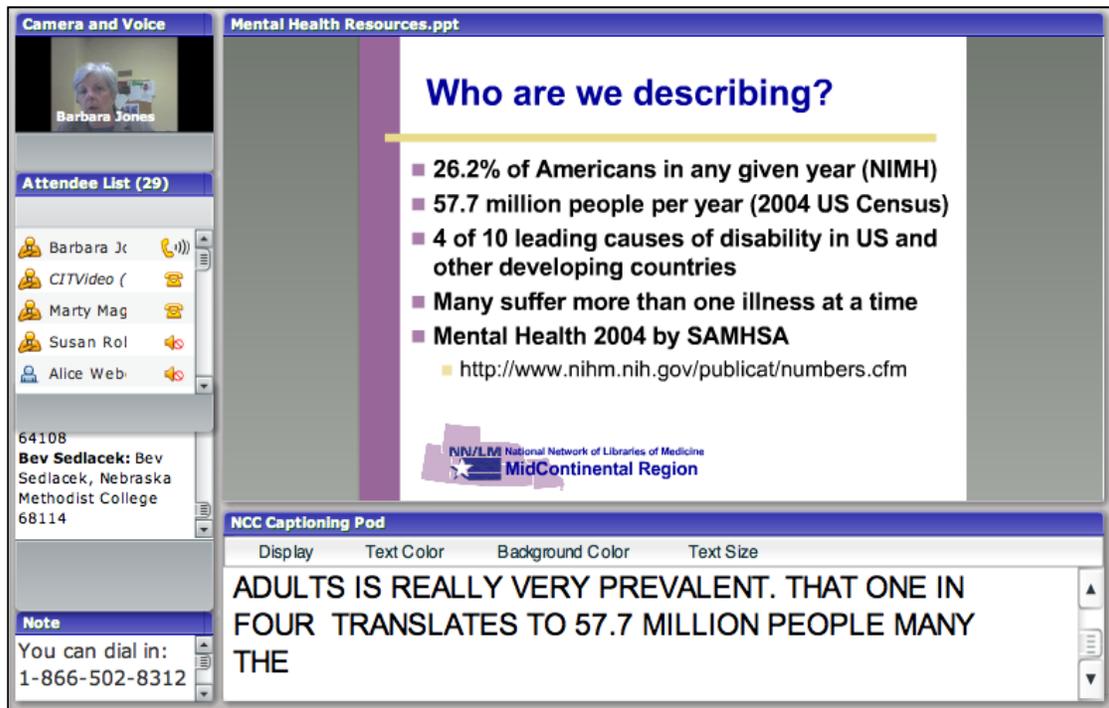


Figure 2. Adobe Connect Session example showing camera, chat, attendee list, captioning, and PowerPoint slides

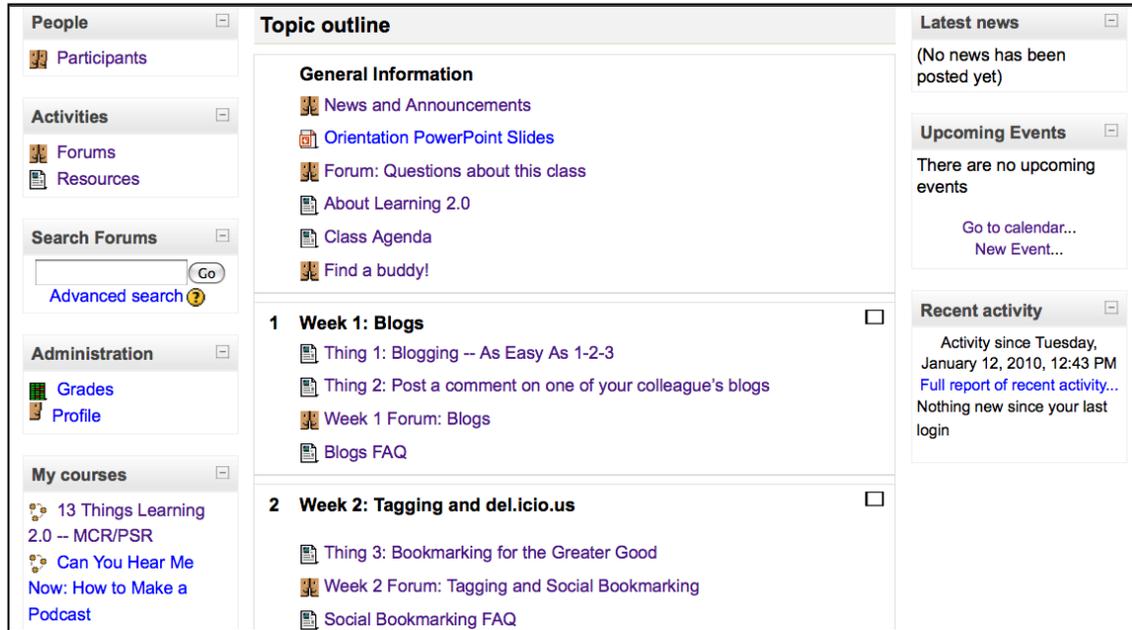


Figure 3. Moodle Course Page for the MCR/PSR RML class “Web 2.0: 13 Things”

As new e-learning technologies unfold, they will be reviewed for possible adoption.

Hybrid class sessions will require a minimum of 12 students and have a maximum enrollment of 30 students. Two trainers will share the responsibilities for each session.

The Adobe Connect portion of the sessions will be offered several times during the day to accommodate different time zones.

The hybrid classes will be promoted to health sciences librarians, public librarians, health professionals, and the public health workforce as part of the promotion plan described in Statement of Work #4.

Hybrid Topic 1: Clinical Trials

The first class to be developed and offered as an e-learning class will be the Clinical Trials.gov class, since the current NLM Gateway/Clinical Trials.gov class will no longer be offered by the NTC as an in-person class. The class will consist of a one-hour synchronous Adobe Connect session followed by a half hour of class work in Moodle. The live session will include a demonstration of the resource with time for class discussion and questions. The Moodle course work will include practice exercises as well as class discussion using Moodle forums.

The Adobe Connect live sessions will be required in order for the participants to receive MLA Continuing Education credit, but will also be recorded and archived so that students can refer back to them later.

NTC will utilize the most current NLM class workbook to develop the Adobe Connect session and Moodle content, and will work with NLM staff to receive approval for the content.

Hybrid Topic 2: NLM Gateway

The second class to be developed and offered as an e-learning class will be the NLM Gateway class, since the NLM Gateway/ClinicalTrials.gov class will no longer be offered by the NTC as an in-person class. The class will consist of two one-hour synchronous Adobe Connect sessions each followed by a half hour of class work in Moodle. The live session will include a demonstration of the resource with time for class discussion and questions. The Moodle course work will include practice exercises as well as class discussions using Moodle forums.

The Adobe Connect live sessions will be required in order for the participants to receive MLA CE credit, but will also be recorded and archived so that students can refer back to them later.

NTC will utilize the most current NLM class workbook to develop the Adobe Connect session and Moodle content, and will work with NLM staff to receive approval for the content.

Rationale for Offering ClinicalTrials.gov/NLM Gateway Hybrid Class

NLM currently offers a Quick Tour suite for ClinicalTrials.gov and has a Quick Tour suite under development for the Gateway.

The ClinicalTrials.gov and NLM Gateway class will no longer be offered as an in-person class after Year 5 of the current contract. We believe there is still a need for training related to these important NLM products. The Quick Tours provide one mechanism for training, but do not provide students the opportunity to ask questions and learn from other students in a class setting. The experience of the NTCC trainers shows that participants do have questions during the class.

In the new contract, the NTC will offer training utilizing interactive e-learning and distance education methods. We believe that this will allow the NTC to expand its training offerings and offer training to new audiences; for this reason, we feel it is appropriate to include ClinicalTrials.gov and NLM Gateway as e-learning classes even though it was not mentioned in the Statement of Work.

We propose to offer the ClinicalTrials.gov and NLM Gateway class as an asynchronous Moodle class, utilizing the Quick Tours for the didactic portion of the class and the current class workbook for class practice exercises. After completing the didactic portion and the practice exercises, students will be able to participate in class discussions utilizing Moodle.

The advantage of this approach is that the Moodle class content can be easily re-purposed from the Quick Tours and from the existing class workbook exercises, while offering students the option to learn about ClinicalTrials.gov and NLM Gateway in an interactive setting.

In addition, we will be able to offer the e-learning class very quickly after the start of the new contract. This will alert the Network that the NTC now includes distance education offerings in addition to the traditional in-person classes.

Hybrid Topic 3: PubMed

The third class to be developed for distance learning will be PubMed. NLM plans to transition the current 7.5-hour class into an 11-hour class. The class will be offered over a four-week period. It will consist of a 1.5-hour Adobe Connect live session each week, along with the expectation that the students will do one hour of class work in Moodle each week. A second one-hour wrap-up Adobe Connect session will be held in Week 4. The Adobe Connect live sessions will be required for MLA CE credit, but will also be recorded and archived so that students can refer back to them later.

NTC will utilize the most current NLM class workbook to develop the Adobe Connect session and Moodle content, and will work with NLM staff to receive approval for the content.

Hybrid Topic 4: TOXNET and Beyond

The fourth class to be developed for distance learning will be TOXNET and Beyond, which is eligible for 7.5 hours of MLA CE credit. The class will be offered over a three-week period. It will consist of a 1.5-hour Adobe Connect live session each week with the expectation that the students will do one hour of class work in Moodle each week. The Adobe Connect live sessions will be required, but will also be recorded and archived so that students can refer back to them later.

NTC will utilize the most current NLM class workbook to develop the Adobe Connect session and Moodle content, and will work with NLM staff to receive approval for the content.

Hybrid Topic 5: NCBI Databases

Teaching NCBI genetic and molecular databases requires trainers with specialized expertise. We have identified three librarians, Diane Rein (University at Buffalo), Gordana Lenart (University of Iowa), and Kristi Holmes (Washington University), experts in bioinformatics who currently develop and teach NCBI database classes and are willing to assist the NTC in developing a plan for NCBI database training. In Year 1, we will form a committee consisting of Dr. Rein, Dr. Lenart, Dr. Holmes, NTC staff, and NCBI staff to develop the plan. The committee will recommend specific content, form, and length for the classes, as well as identify qualified trainers to teach the classes. With the approval of NLM, we will begin offering the classes in Year 2.

NCBI staff is planning to offer in-person “Discovery Workshops” (http://www.ncbi.nlm.nih.gov/Education/discovery_workshops.shtml) at various locations around the country, as well as continue to offer webinars (<http://www.ncbi.nlm.nih.gov/Education/webinars.shtml>) for remote participants. The NTC committee members will work with NCBI training staff to coordinate NCBI training topics and schedules.

Techniques To Promote Interactivity

All hybrid classes will use a variety of techniques to encourage interactivity and “bond” the class as they would in an in-person environment. Techniques include:

- In the first synchronous Adobe Connect session, include class introductions with each student using the whiteboard to draw or write something about themselves;
- Use the Adobe Connect “break-out” rooms for short group practice exercises to simulate the current practice of having two or more people work together in the in-person class;
- Regularly ask verbal questions of the students during the Adobe Connect sessions;
- During Adobe Connect sessions, periodically conduct student “polls” with short multiple choice questions to assess student understanding of the content;
- Ask students to post biographical information and pictures of themselves (if they are comfortable doing so) in Moodle; and
- Set up discussion and question and answer forums in Moodle for each topic in the class.

We believe that these techniques will not only create engagement during the class, but also provide the opportunity for students to form professional bonds and friendships after completing the class, reflecting what happens when attending in-person classes.

WEBINARS

We will develop and deliver one-hour live “webinar” sessions using Adobe Connect to cover topics of immediate interest, such as updates to NLM products. The sessions may also cover other topics of interest not suitable for longer classes, such as how to set up RSS news feeds or access social networking updates for NLM products and services. Other potential topics include: the Unified Medical Language System® (UMLS®); and disaster management tools available from the Division of Specialized Information Services (SIS) (<http://disaster.nlm.nih.gov/>). All content for the live sessions will be approved by NLM.

We will develop and deliver a webinar covering adult learning principles and instructional design best practices. This webinar will assist librarians who are trainers as they design classes for adult learners. We will also develop and deliver a webinar about using authoring tools to create self-paced tutorials and re-usable learning objects. **The authoring tools Webinar will focus on criteria for evaluating features of authoring tools. Many products will be used in the examples and we will not endorse or promote a particular commercial product.**

Registration will be required for the webinars. We will utilize the NTC registration system (see Statement of Work #8). The NIH Adobe Connect license allows up to 200 participants; advance notice of an event is required when more than 50 participants are expected.

SELF-PACED TUTORIALS

Self-paced tutorials allow users to learn about NLM products on their own time, at their own speed of learning. We will develop two types of self-paced tutorials:

1. Longer form content that addresses a particular topic but has more than one learning objective. The PubMed tutorial (<http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/>) is an example.
2. Short “just-in-time” screencasts that answer a particular question or demonstrate a particular action. Examples include the 3-minute long “Search PubMed for an Author” (<http://www.nlm.nih.gov/bsd/viewlet/search/author/author.html>), which is part of the “PubMed QuickTours” series.

The tutorials will be engaging to the user by using multimedia (audio and video screencasts) as much as possible. Interactive features, such as short quizzes to access knowledge gained, will be included in the tutorials. Lessons or chunks of content that meet one learning objective within the tutorials will be exported as SCORM (Shareable Content Object Reference Model) packages so that they can be imported and re-used in course management systems such as Moodle.

NLM has already developed a variety of self-paced tutorials for many of its products, including PubMed (<http://www.nlm.nih.gov/bsd/disted/pubmed.html>), NLM Environmental Health and Toxicology Databases (<http://sis.nlm.nih.gov/enviro/toxtutor.html>), UMLS (<http://www.nlm.nih.gov/research/umls/online%20learning/index.html>), NLM Gateway (<http://gateway.nlm.nih.gov/gw/Cmd?Help.x>), and Clinical Trials.gov (<http://www.nlm.nih.gov/medlineplus/clinicaltrials.html>). There are specific aspects of the products that are candidates for shorter “just-in-time” tutorials and there are also other specific topics that are possibilities for self-paced tutorials.

Examples of shorter “just-in-time” tutorials include:

- Setting up a MyNCBI account.
- Creating custom filters in PubMed.
- Importing PubMed citations into free online citation programs such as CiteULike.

Examples of longer form self-paced tutorials include:

- Subheadings in PubMed: How does subheading explosion work and how to free float a subheading.
- Limits and filters in PubMed: how, why and when.
- PubMed search builders, MeSH® Database, Journals Database and the Search Builder in Advanced Search.
- The NLM Gateway Locker: how to customize your use of the Gateway.

In order to determine topics for the self-paced tutorials, we will develop a needs assessment in conjunction with NLM and OERC. The needs assessment will be conducted using SurveyMonkey and promoted through the RML and MLA listservs and other communication channels.

We will also work with NLM and OERC to identify appropriate sub-populations of the general public for the self-paced tutorial needs assessment. This may include public librarians and health educators. We will work with NLM and OERC to identify appropriate channels to promote the needs assessment questionnaire to the general public.

The RMLs may be planning development of Moodle classes related to the same topics, so we will also poll the RMLs to determine overlap and to avoid duplication of effort. In cases where the RML is working on a topic, we will suggest working with them to develop the content. Chunks of content related to a particular learning objective can be packaged as a SCORM learning object so that it can be imported into Moodle for use in an asynchronous class. This will allow RML trainers to avoid duplication of effort but still be able to customize the class for their region. NTC will also utilize the NN/LM staff wiki to provide information about content currently under development, so that all the RMLs are aware of NTC's development efforts at any given time.

In addition, other potential topics may include content from popular classes developed by the RMLs related to consumer health, technology, nursing resources, mental health resources, Spanish language resources, and public health information. We will work with the RML trainers to determine if content from these classes is suitable for development as a self-paced tutorial.

We will work with NLM staff to analyze the results of the needs assessment and choose topics for development. We will search for existing tutorials related to the selected topics by querying the RMLs as well as searching the MLA Educational Clearinghouse and MLA CORE Toolbox. If a suitable tutorial is found, we will work with the original author to receive permission to adapt the tutorial for NLM.

The tutorials will be developed using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) and the rapid prototyping model for the design, development and implementation phases.

Analysis: Defining learning objectives, learner characteristics, and learning constraints

For each tutorial, we will work with NLM staff to define the learning problem, learner characteristics, and learning constraints. During the analysis phase we will write learning objectives using the Bloom's Taxonomy methodology. We will also develop a timeline for completion of the tutorial.

Design: Define content, assessment activities, format and length

We will work with NLM staff to design the content and assessment activities that will meet the learning objectives identified in the analysis phase. Assessment activities may

include short multiple-choice quizzes or “drag and drop” games that require the users to organize information they have learned.

We will determine the appropriate length and format for the tutorial. “Just-in-time” screencasts will be produced for use within a longer-form tutorial and for use within the hybrid classes as well.

As per NLM requirements, the tutorials will be created to run on the current top three web browsers and HTML version listed on the NLM web development page (<http://www.nlm.nih.gov/web/documentation/>). The tutorials will use commonly available plug-ins such as Flash.

The tutorials will be developed using two authoring programs, ViewletBuilder / ViewletQuiz (<http://www.qarbon.com/presentation-software/viewletbuilder/>) and SoftChalk (<http://www.softchalk.com/>). NLM staff use ViewletBuilder to create the PubMed QuickTours, and the NTCC currently uses ViewletQuiz to create the pre- and post-tests for in-person classes. SoftChalk is used by the University of Utah Technology Assisted Curriculum Center (TACC) to create web-based lessons. Both tools are reasonably priced.

ViewletBuilder is a tool for capturing, editing, annotating, compiling and delivering screencasts. ViewletBuilder Enterprise also includes ViewletQuiz, which allows the developer to create quizzes in a variety of formats (multiple choice, short answer, Likert scale, click map, and drag and drop). ViewletBuilder content is published on the web in Flash format.

SoftChalk is an e-learning content creation tool for developing interactive web-based tutorials. SoftChalk allows the developer to create a lesson with text, audio, video, graphics, screencasts, quizzes, and other interactive activities without programming. Multiple lessons can be combined into a course. A scoretracker keeps student response data for later analysis. SoftChalk content is published on the web using the HTML and Flash formats. SoftChalk produces accessible content and provides information about how each SoftChalk component complies with Section 508 guidelines.

We will use ViewletBuilder for short “just-in-time” screencasts and for capturing screens as part of longer form tutorials. We will also use it to create quiz questions for the short screencasts and develop the pre- and post-test skills assessments for both in-person and e-learning classes.

We will use SoftChalk to develop longer form content utilizing a variety of media formats and lesson activities to keep the lesson interactive and engaging. SoftChalk lessons will incorporate text, hyperlinks, graphics, audio, video, and screencasts created by ViewletBuilder. SoftChalk lessons will also include self-assessment quizzes in multiple choice, short answer, matching, and drag and drop formats. SoftChalk allows for the

creation of other types of activities, including interactive illustrations, sorting and ordering activities, crosswords puzzles and flashcards.

SoftChalk supports the incorporation of “widgets,” or short chunks of web code, into the lessons. Widgets developed by the NTC or by others will be incorporated into the SoftChalk lessons. For example, the Centers for Disease Control and Prevention (CDC) has created widgets related to the H1N1 flu, tobacco use, diabetes, and other health topics (<http://www.cdc.gov/widgets/>). Widgets can also display the latest information from blogs or Twitter feeds.

Both tools will export to the SCORM format to create re-usable learning objects for import into course management systems.

Development: Produce the tutorial, conduct formative evaluation, and revise

The NTC development team will include NTC team members (the Assistant Director, the trainers, and web developer) as well as an instructional designer from the University of Utah Technology Assisted Curriculum Center (TACC). We will work with NLM on all phases of development.

Tutorial development steps using the rapid prototyping model will include:

- Storyboard development and approval by NLM.
- Initial rapid prototyping.
- NLM staff review and approval of the prototype.
- Iterative development, review, and formative evaluation in collaboration with NLM staff.

The complexity and time required to develop a particular tutorial will depend on the topic and expected length of the tutorial.

Working with NLM, the NTC team will develop storyboards for the selected topic. Once the storyboards are approved by NLM, the NTC will produce an initial rapid prototype of the tutorial for approval by NLM. The NTC and NLM will then participate in an iterative review, design and formative evaluation process. Formative evaluation is designed to ensure that the goals of the tutorial are being met, to identify problems and to suggest improvements to solve the problems. With NLM’s approval, NTC will recruit several NN/LM staff to participate in the formative evaluation.

Using flow charts or other visual aids for tutorial navigation can help users see the logic of the material and serve as an “advanced organizer” for the class.¹⁵ During the tutorial development phase, we will also explore creative presentation options for the tutorials so that they are engaging to users. For example, “Common Craft” short tutorials available on YouTube use animated “stick figure” drawings and a witty, “plain English” script to describe web 2.0 services (<http://www.commoncraft.com/>). Another example is the use of non-linear presentation systems such as Prezi (<http://prezi.com>). Prezi is a Flash-based application that allows the presenter to create a visual map containing words, links, images, etc.

Some tutorials may be programmed to allow personalized or adaptive learning. Adaptive learning programs “learn” about the skills and knowledge of the student, and then use that information to guide the student through the program. Students will have different experiences throughout the tutorial depending on their skill and knowledge levels. NTC will work with NLM to determine if this method of tutorial development will be appropriate.

Implementation: Tutorial release and promotion

Final release of the tutorial will occur after approval by NLM staff. The tutorial will be made available on NLM and NN/LM servers.

In addition, we will publish the short “just-in-time” tutorials on a YouTube channel. The YouTube format does not allow for interactivity; this will be for short screencasts only. The YouTube channel will have links to the NLM and NN/LM web sites. YouTube offers a comment section where users can leave feedback about the tutorials.

With approval by NLM, longer form content will be published on iTunesU through the University of Utah iTunes site. Content may include handouts in PDF format, audio files in the .MP3 format, or video files in the .MP4 format. A course may consist of any combination of these formats. iTunesU content does not allow for interactivity, but has the advantage that users can download the content for later off-line viewing. The NTC will work with NLM to determine which tutorials are appropriate for an iTunes format.

We will also export tutorial content to a SCORM package for re-use by other trainers. SCORM packages will be chunked into modules that support one learning objective within the tutorial. We will publish the SCORM packages on the NTC web site as well as linking to them from the MLA Educational Clearinghouse. In cases where the content is appropriate for health sciences educators, we will submit the tutorial to MedEdPortal (<http://services.aamc.org/30/mededportal/servlet/segment/mededportal/information>), a free online peer-reviewed publication service provided by the Association of American

¹⁵ “Presenting Course Outlines in a Flow Chart Format,” *T+D Magazine*, February 2010, 76-77.

Medical Colleges (AAMC), and MERLOT (<http://merlot.org>), a repository of teaching materials for higher education faculty and students.

The NTC will utilize the promotion mechanisms listed in Statement of Work #4 to promote the tutorials.

Evaluation: Summative evaluation

The assessment activities built into the tutorial will determine if the learner gained skills and knowledge from the tutorial. The results of the assessment activities will be stored for analysis by the NTC team and NLM staff. We will also adapt questions from the Flashlight network to assist with evaluating the technology activities in the tutorials. Summative evaluation will be assessed from the results of the analysis. The learning objectives and activities may be revised based on the results of the analysis.

MOBILE LEARNING PILOT PROJECT

We will conduct a pilot project to offer training using mobile devices. We will consult with NLM staff to develop the pilot project. One of the self-paced tutorials we develop will also be available on two additional platforms: the iPhone / iTouch and the iPad. All three platforms will contain the same content and have the same learning objectives and assessment activities.

We will enlist a group of thirty users to participate in a study to determine the effectiveness of various platforms. The users will be divided into three groups and required to complete the tutorial using one of the platforms. Participants will be required to complete a pre-test, post-test, and student satisfaction questionnaire. At the end of the study period, we will determine if mobile device users gained skills and knowledge equal to non-mobile delivery learners.

The iPad and iPhone platforms do not currently allow the use of Flash, so tutorials will have to be developed using an alternative interactive technology, such as HTML5. It is possible that NLM will update its approved HTML version list to include HTML5 by the time of this pilot project.

Upon completion of the pilot project, we will work with NLM staff to determine if additional tutorials should be made available on mobile platforms.

SECTION 508 COMPLIANCE

In order to eliminate any technical barriers to accessing information, to provide equal opportunities for people with disabilities, and to encourage the development of technologies that will help achieve these goals, all e-learning products will adhere to

Section 508 requirements during the planning, coordinating, delivering, and archiving of e-learning products and events.

For the live web classes, we will use the NIH Adobe Connect captioning services currently available for no charge to NN/LM. Self-paced tutorials in the Flash format will also have captions using captioning tools such as those built into ViewletBuilder, or external tools such as the Flash Accessibility Panel or Media Access Generator (MAGpie) from WGBH's National Center for Accessible Multimedia and Hi-Caption SE (<http://www.webaim.org/techniques/flash/text.php>).

To ensure that web pages, PowerPoint presentations, PDF documents, Word documents and other online documents are Section 508 compliant we will utilize the following resources:

- The Health and Human Services (HHS) checklists to verify online documents (<http://www.hhs.gov/web/508/checklists/index.html>)
- W3C WAI: Strategies, guidelines, resources to make the web accessible to people with disabilities (<http://www.w3.org/WAI/guid-tech.html>)
- W3C Web Accessibility Quick Reference (<http://www.w3.org/WAI/WCAG20/quickref/>)
- WebAIM PowerPoint Accessibility Techniques (<http://www.webaim.org/techniques/powerpoint/>)
- WebAIM WAVE, a free web accessibility evaluation tool (<http://wave.webaim.org/>)
- Dreamweaver CS 5 Built-in Accessibility Checker
- Adobe Acrobat Pro Built-in Accessibility Checker
- AccessColor: For checking color contrast of web sites for color-blind or vision impaired users (<http://www.accesskeys.org/tools/color-contrast.html>)

For the most current information about guidelines, tools and resources for Section 508 compliance and web accessibility we will refer to the following:

- Section 508.gov (<http://www.section508.gov/>)
- The Health and Human Services Section 508: General Information and Resources (<http://www.hhs.gov/web/508/index.html>)

- NIH Web Authors Group (WAG): Policy & Guidance on Web Site Development, Management, and Evaluation (<http://www.nih.gov/icd/od/ocpl/resources/wag/>)
- The National Library of Medicine Web Application/Site Development Guidelines (<http://www.nlm.nih.gov/web/documentation/index.html>)

1. b. Submit drafts of all e-learning products (e.g., outlines, storyboards, wire frames) for NLM review and approval prior to production;

We will submit drafts of all materials related to e-learning products, including hybrid classes, webinars, and self-paced tutorials, to NLM for approval prior to production. For the synchronous portion of hybrid classes and for webinars, we will submit PowerPoint presentations and outlines of the planned class. For the asynchronous portion of the hybrid classes, we will make the Moodle content available to NLM prior to announcing the class. For the self-paced tutorials, we will submit storyboards and rapid prototypes as described in Statement of Work 1. a.

For all e-learning activities, we will work with NLM in an iterative review process during the development of the class or tutorial.

1. c. Submit all raw development files (e.g., .fla, .cp, .qvp, .cam files) used to create the products with the production files to NLM;

We will submit all raw files developed as part of the tutorial production process to NLM, including those raw files created by the authoring system before exporting to the final web-based format. Examples are the Flash authoring format (.fla), the Captivate source file (.cp), the Camtasia source file (.cam), the ViewletBuilder project file (.qvp), and the SoftChalk project file. The raw files will be used for later editing during the maintenance and update processes.

1. d. Schedule live e-learning events in consultation with NLM;

Hybrid class schedules and webinar schedules will be planned in consultation with NLM. Live sessions will be repeated several times a day to accommodate different time zones. For a schedule listing the planned number of events, see Schedule on Page 37.

1. e. Register all students for live e-learning events;

The hybrid classes and live webinars will be open to all. Registration will occur through the NTC online registration system (see Statement of Work #8). The current registration system has an option to handle online class registration.

1. f. Record all live e-learning events for posting and archiving;

All hybrid class synchronous sessions and live webinars will be recorded using Adobe Connect's record feature. Links to the recordings will be posted on NTC's web site and in the MLA Educational Clearinghouse. Listings will include appropriate metadata to allow users to search recordings for particular topics.

1. g. Maintain and update self-paced products;

Regular maintenance of the self-paced tutorials produced by NTC will occur. We will review the tutorials at least once a year and update them with new content as appropriate. As we receive feedback from users regarding technical problems or content corrections and enhancements, we will make appropriate adjustments. We will also update the tutorials following new releases of NLM products. We will ensure that all delivery channels and repository records are updated as appropriate. All maintenance fixes and updates will be performed in consultation with NLM.

1.h. Design and conduct student knowledge and skills assessments for each product using a collection and reporting system approved by NLM (e.g., ViewletQuiz; SurveyMonkey). NLM must review and approve assessment tools prior to use by the contractor;

1. i. Design and conduct assessments of student satisfaction with each training product;

HYBRID CLASS AND LIVE WEBINAR EVALUATION

We will develop an evaluation strategy for the hybrid e-learning classes and live webinars using the four levels of the Kirkpatrick model. Currently, the NTCC has developed assessment tools for the in-person classes at Level 1 (assessment of student satisfaction) and Level 2 (knowledge and skills assessment). Level 1 assessments are conducted using a modified version of the MLA class evaluation form, with some NLM approved changes. For the e-learning classes, this assessment will be administered using SurveyMonkey. To receive MLA CE credit, participants must complete the evaluation. SurveyMonkey allows us to efficiently process the data and provide reports to NLM.

Level 2 assessments are currently conducted using pre- and post-training tests. We will design similar Level 1 and 2 assessments for the e-learning offerings, and administer them with approval from NLM. The pre- and post-test questionnaires will be developed using ViewletBuilder. Following current practice, the pre- and post-training evaluations will be administered approximately ten business days before and ten business days after the class.

We will conduct a Level 3 (knowledge transfer back to the job) assessment for all sessions of the e-learning and in-person classes in Year 2 of the contract. The post-training assessment will be designed with the assistance of the OERC and NLM. This assessment will be sent to students who have given us permission to follow up with them. We will use this assessment tool to determine if students improved their search skills and information retrieval, and if they in turn, taught others.

In Year 5 of the contract, we will work with OERC and NLM to design a Level 4 (return on investment) research study to examine a) return on investment (ROI); and b) other potential business consequences as a result of participating in the NTC classes.

We will compile the results of the Level 3 and Level 4 evaluations, and submit them for presentations and publications with national organizations and journals.

All evaluation and assessment results will be reported to NLM along with specific recommendations for improving learning outcomes and student satisfaction (see Statement of Work #5). We will work with NLM to ensure that assessment and evaluation results are part of a continuous feedback loop that will inform improvements to the e-learning offerings.

SELF-PACED TUTORIAL EVALUATION

We will conduct summative evaluations of the self-paced tutorials. The assessment activities built into the tutorials will determine if the learners gained skills and knowledge from the tutorials. We will also adapt questions from the Flashlight network to assist with evaluating the technology activities in the tutorials. The results of the assessment activities will be stored for analysis by the NTC team and NLM staff. Summative evaluation will be assessed from the results of the analysis. The learning objectives and activities may be revised based on the results of the analysis.

1. j. Provide NLM with any relevant raw data not submitted to the reporting system, and a summary report of the training activity within two weeks following each live e-learning event.

Student satisfaction assessments and student knowledge and skills assessments will be submitted to NLM within a month following the completion of e-learning sessions. We will provide NLM with any relevant raw data not submitted to the reporting system as well as a summary report of the training activity within two weeks following each e-learning session.

Performance Measures:

- At least one live one-hour Adobe Connect session will be held per quarter, starting with quarter two of Year 1, covering product updates and other topics of interest.
- At least one live one-hour Adobe Connect session will be held per year for RML trainers and other interested trainers, covering adult learning principles, instructional design best practices, and authoring systems.
- At least four NCBI distance education sessions will be held per year beginning in Year 2.
- One hybrid class session per quarter is offered for NLM Gateway, Clinical Trials.gov, PubMed, and TOXNET and Beyond beginning in quarter 3 of Year 2.
- Over 75% of hybrid class participants indicate that they are “Very Satisfied” with the class.
- Over 75% of hybrid class participants increase their knowledge and skills based on pre- and post-test scores.
- Over 70% of hybrid class participants indicate that the sessions met the learning objectives.
- Over 50% of hybrid class participants indicate in a follow-up questionnaire that they have improved their information retrieval skills as a result of the classes.
- Over 70% of webinar participants indicate that the learning objectives were met.
- Summative evaluation of the tutorial assessment activities shows that over 75% of tutorial users gain the skills and knowledge expected from the learning objectives.

- Summative evaluation of the mobile device tutorial assessment activities shows that over 75% of tutorial users gain the skills and knowledge expected from the learning objectives.
- At least six re-usable learning objects are incorporated into Moodle courses taught by RML trainers.
- All information required by NLM for each instructional session is sent within two weeks of the event.
- All NTC e-learning instructional offerings are Section 508 compliant.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Offer at least one one-hour live Adobe Connect session on topics of interest per quarter, starting with the second quarter.	X				
Offer least one live one-hour Adobe Connect session per year for RML trainers and other interested trainers, covering adult learning principles, instructional design best practices, and authoring systems.	X	X	X	X	X
Form the NCBI database class committee and begin planning class offerings.	X				
Develop a hybrid class for Clinical Trials.gov using Adobe Connect and Moodle.	X				
After approval from NLM, offer one session of the Clinical Trials.gov hybrid class per quarter (quarters 3 and 4).	X				
In consultation with NLM, conduct the self-paced tutorial needs assessment (quarter 3).	X				
Develop a hybrid class for NLM Gateway using Adobe Connect and Moodle.		X			

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
After approval from NLM, offer one session of the Gateway hybrid class per quarter (quarters 3 and 4).		X			
Develop a hybrid class for PubMed using Adobe Connect and Moodle.		X			
After approval from NLM, offer and deliver one session of the PubMed class per quarter (quarters 3 and 4).		X			
Develop a hybrid class for TOXNET and Beyond using Adobe Connect and Moodle.		X			
After approval from NLM, offer (and deliver) one session of the TOXNET and Beyond class per quarter (quarters 3 and 4).		X			
In consultation with NLM, choose and prioritize topics for self-paced tutorials based on the needs assessment results.		X			
Begin the self-paced tutorial development cycle for one tutorial using the ADDIE model, with release of the first topic by the end of quarter 2.		X			
Publish self-paced tutorial content to YouTube, iTunes, and learning object repositories as appropriate.		X			
Conduct the mobile learning pilot project and submit results to NLM.		X			
Offer and deliver at least one one-hour live Adobe Connect sessions on topics of interest per quarter.		X	X	X	X
Offer and deliver four sessions of the NCBI database class per year.		X	X	X	X

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Maintain and update the content for the hybrid classes, with NLM's approval.			X	X	X
Offer and deliver one session per quarter of the hybrid classes on Clinical Trials.gov, NLM Gateway, PubMed, and TOXNET and Beyond.			X	X	X
Continue to implement the self-paced tutorial development plan.			X	X	X
Publish self-paced tutorial content to YouTube, iTunes, and learning object repositories as appropriate.			X	X	X
Based on the results of the mobile learning pilot project, offer additional mobile learning tutorials.			X	X	X
Review current assessment tools with NLM and revise as needed; administer assessments, compile results, and report to NLM after each session.	X	X	X	X	X
Conduct a Level 3 follow-up assessment with NLM's approval.			X		X
Conduct a Level 4 follow-up assessment with NLM's approval.					X
Submit results of Level 3 and Level 4 assessments to a journal for publication.				X	X

Statement of Work #2

Statement of Work

2. The contractor shall conduct at least 20 in-person classes each contract year for trainers of NLM systems. These classes will be on PubMed (1.5 days in length, totaling 11 hours of instruction) and TOXNET and Beyond (1 day in length, totaling 7.5 hours of instruction). NLM will develop the instructional materials for these in-person classes offered by the NTC and by NLM in Bethesda. Specifically, the contractor shall undertake the following:

- a. Schedule classes to be held at the RMLs and other locations, as appropriate, taking into account equitable geographic distribution and demand for training in selecting the number and mix of classes per fixed site. The contractor will coordinate with staff at the training locations to develop the schedule and ensure that the facilities are appropriate, available and prepared for training;
- b. Register students for classes. Classes must have no fewer than 12 registrants to be held;
- c. Travel to the training sites and deliver classroom instruction. Two instructors shall conduct the training for each class;
- d. Design and conduct student knowledge and skills assessments for each class using a collection and reporting system approved by NLM (e.g., ViewletQuiz; SurveyMonkey). NLM must review and approve assessment tools prior to use by the contractor;
- e. Design and conduct assessments of student satisfaction with each class; and
- f. Provide NLM with a class roster, any relevant raw data not submitted to the reporting system, and a summary report of the training activity within two weeks following each class.

Objective & Rationale:

Objective:

In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, ~~health professionals, and the public health workforce through a variety of delivery methods.~~ **and other health professionals who conduct training on NLM resources.**

Rationale:

While the e-learning offerings described in Statement of Work #1 will meet the needs of many learners, there are other learners who prefer in-person classes. Health sciences librarians, **public librarians and other health professionals** with the budget and time to attend these classes, will be able to increase their skills and knowledge of NLM products

~~as well as train others within their institutions.~~ **This is viewed as a train-the-trainer opportunity.**

Health professionals, public health workers, and public librarians who do not have access to training from their institutions can also benefit from NTC training. The RMLs have developed relationships with health professional organizations that serve specific groups (such as nurses, physician assistants, public health workers, etc.) The NTC team will work with the RMLs to identify appropriate venues for training these groups.

A recent meta-analysis conducted by the U.S. Department of Education looked at studies over the last 12 years that compared online education with in-person courses.¹⁶ The findings showed that “blended” classes, which included both online learning and in-person instruction, produced the best results, most likely due to increased instruction time. Offering blended classes provides students an opportunity to attend in-person class, have time to absorb the skills and knowledge gained during the class, and then follow up with an e-learning session offering practice exercises and discussion.

Classroom videoconferencing technology has improved over the last few years, so it is now possible to deliver instruction with one trainer onsite and one trainer at a remote site. Systems such as Tandberg and Polycom offer high quality video and audio with minimal latency.

Outcome:

- Class participants develop the skills and knowledge needed to improve access to biomedical information.

Approach and Methodology:

2. The contractor shall conduct at least 20 in-person classes each contract year for trainers of NLM systems. These classes will be on PubMed (1.5 days in length, totaling 11 hours of instruction) and TOXNET and Beyond (1 day in length, totaling 7.5 hours of instruction). NLM will develop the instructional materials for these in-person classes offered by the NTC and by NLM in Bethesda.

Due to the increased resources and time needed to deliver e-learning instruction, the number of in-person classes will be reduced from an average of 50 per year in the 2006-2011 period to 20 per year. **Due to budget restrictions in Year 1, we have reduced the**

¹⁶ “Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies,” U.S. Department of Education Office of Planning, Evaluation, and Policy Development Policy and Program Studies Service, May 2009, Accessed from <http://www.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>.

number of in-person classes to 13 (nine PubMed® and 4 TOXNET® and Beyond). We have scheduled at least one class per region. In addition, we have retained the videoconferencing class pilot at the University of North Carolina, Chapel Hill; one instructor will be on site at the University of North Carolina and one instructor will teach remotely from Salt Lake City. We believe it is important to retain the videoconference pilot class since it may allow us to reduce travel costs in the future.

We have assumed that the PubMed class will be 1.5 days in length. In the future, if the PubMed curriculum changes to allow for a one day class, we may be able to offer additional in-person classes at that time. We will also add in-person classes if future budgets allow.

The schedule for the May – August 2011 in-person classes may be adjusted if the current NTCC contract is extended during that time.

The NTC team will deliver the 1.5 day PubMed and 1 day TOXNET and Beyond in-person classes using the instructional materials developed by NLM.

2. a. Schedule classes to be held at the RMLs and other locations, as appropriate, taking into account equitable geographic distribution and demand for training in selecting the number and mix of classes per fixed site. The contractor will coordinate with staff at the training locations to develop the schedule and ensure that the facilities are appropriate, available and prepared for training;

In-person classes will be scheduled with the eight RMLs to assure equitable geographic distribution based upon demand for training. The NTCC trainers who will be joining the NTC team have established relationships with 43 potential host sites that meet the requirements and have agreed to serve as training sites. (See Appendix D for Training Facility Letters of Agreement). In April and May 2010, the training sites also completed a facility information form that identified the number of computers available in the facility, maximum number of participants, and availability of videoconferencing. All sites agreed that there would be no charge for the use of their training facilities. The NTC will continue to update host site training facility information throughout the contract period.

The schedule will be developed with the following properties:

- Covers a 12-month period, May through April;
- Is submitted to NLM on June 30 of the prior year;

- Includes two sets of classes – those conducted at the nationally distributed training sites by the trainers from the NTC and those classes conducted at the NLM by trainers from the MEDLARS Management Section (MMS);
- Reflects an equitable geographic distribution; and
- Reflects the geographical locations that have received requests for classes by the RMLs and their Network members.

Additional classes may be scheduled ~~on a cost recovery basis, either in the event of requests for classes scheduled outside the NLM pre-approved schedule, or to replace a class canceled for insufficient registration (less than 12 participants)~~ **or as requested.** Tentative calendars of the proposed schedule and maps showing the geographic distribution of classes for Year 1 and Year 2 appear in Appendix B.

Two NTC trainers will teach each class. Classes with fewer than 12 participants enrolled will be canceled.

~~In addition, the NTC will work with the RMLs who have established relationships with health professional organizations to determine if training can be offered to these groups, whether at the host sites or as part of an organization's annual meeting. In addition, the RMLs will be establishing relationships with the Department of Health and Human Services Regional Extension Centers (RECs) (<http://www.hhs.gov/news/press/2010pres/02/20100212a.html>) to assist health professionals with implementing and using health information technology. This may offer the opportunity for the NTC to work with the RMLs to provide training to health professionals. Members of the NTC team also have contacts with national and regional public health groups. Based on these contacts, we will offer NTC training at annual meetings for health professionals. We plan to offer one class per year at a health professional conference and one class per year at a public health conference. We will also work with the RMLs to promote the classes to public librarians.~~

~~Health professionals and public health workers are often motivated to attend classes that offer continuing education credits granted by their professional organizations. Continuing Medical Education (CME) credits will be offered through the University of Utah Continuing Medical Education Office. We will offer Continuing Health Education Credits (CHEC) through the National Commission for Health Education Credentialing (NCHEC) organization; public health educators and health education specialists are accredited by this organization.~~

We propose to work with the Regional Extension Centers (RECs) and professional organizations to promote e-learning opportunities rather than in-person classes. As part of the new contract, the RMLs will be establishing relationships with the RECs; we will work with the RMLs to promote e-learning training opportunities to their contacts

within the RECs and other professional organizations. However, outreach to the RECs and public health workforce is the primary responsibility of the RMLs and should not take precedence over NTC SOW responsibilities. Since engagement with the RMLs is one of our guiding principles, we believe it is important to stay aware of possible collaborations with the RMLs.

Members of the NTC team also have contacts with national and regional public health groups; we will utilize these contacts to promote e-learning offerings to the public health workforce.

The NTC will utilize the promotion mechanisms listed in Statement of Work #4 to promote the in-person classes.

2. b. Register students for classes. Classes must have no fewer than 12 registrants to be held;

The NTC staff will manage and maintain a registration system for all NTC and NLM Bethesda training classes and live e-learning events. Registration will be conducted through a web-based registration system (<http://nmlm.gov/ntcc/classes/schedule.html>) for all in-person classes, including those scheduled in Bethesda, MD (see Statement of Work #8). Classes must have at least 12 registrants to be held. After the maximum number of registrants is reached, the registration system places potential registrants on a waiting list.

The registration database will be maintained on the nmlm.gov server. A report containing a list of posted classes and the number of registrants from each class will be compiled and analyzed weekly, and the report distributed electronically to NLM and NTC staff.

2. c. Travel to the training sites and deliver classroom instruction. Two instructors shall conduct the training for each class;

IN-PERSON CLASSES

The 1.5 day PubMed class and the 1 day TOXNET and Beyond class will be offered as in-person classes. Two trainers will be available to travel to each site to share training responsibility. Adequate back-up trainers will be available in case of unavailability of one or both trainers. NLM staff will develop the class learning objectives and instructional materials. The NTC team will formally confer with NLM staff via Adobe Connect at least twice a year to review the instructional materials. Additionally, NTC staff will receive database updates as they develop.

The adult learner characteristics described in Statement of Work #1 also apply to in-person classes. In 2006, MCR staff attended “Bob Pike’s Train-the-Trainer Boot Camp” (<http://www.bobpikegroup.com/pages.asp?pageid=14699>). The Boot Camp focused on applying adult learning theories to design and delivery of classes, and in particular on alternative activities to keep users engaged during a class. Techniques for opening, closing, and energizing students throughout the day were discussed. The NTC staff will review these ideas with NLM to determine if they can be incorporated into the in-person classes in order to keep students engaged and increase learning retention.

~~To increase student participation and engagement, we will incorporate the use of an Audience Response System (ARS). The ARS allows students to participate during the class by submitting responses to interactive questions using a hand-held keypad (“clicker”). The trainer can set up the ARS questions to test for current knowledge, deliver an opinion poll, or check that students have understood the material to date. The ARS is also a data collection and assessment tool; we will be able to assess and compare results for different classes and instructors. The ARS data will inform future improvements to classes.~~ **The Year 1 budget does not allow purchase of a physical Audience Reponse system; however, we will investigate the possibility of using free online polling tools (such as Poll Everywhere, <http://www.polleverywhere.com/>) that users can access through a web browser, cell phone text message, or Twitter.**

BLENDED CLASSES

“Blended” classes are defined as a combination of in-person and e-learning instruction. This contrasts to the hybrid classes described in Statement of Work #1, which are defined as using a combination of e-learning delivery methods.

The 1.5 day (11 hours of MLA CE credit) PubMed class is a good candidate for a “blended” class containing both in-person and e-learning instruction. We will create a 1 day (7.5 hour) in-person class followed by 3.5 hours of self-directed learning through the Moodle course management system. Students will be required to complete the Moodle coursework a week after the in-person class. This gives students the time to absorb what they have learned in the in-person class. By the time they participate in the Moodle portion of the course, they will likely have additional thoughts and questions. The Moodle coursework will help “cement” the skills and knowledge gained during the in-person class.

VIDEOCONFERENCING OPTION

From the training facility information form completed by the host sites, we have determined that twelve host sites currently have videoconferencing equipment available in the training classroom. In Year 1, we will pilot an in-person class via videoconferencing. One NTC trainer will be in Salt Lake City and one NTC trainer will be

at the University of North Carolina, Chapel Hill. The two trainers will share instruction time throughout the day.

Following this pilot videoconference class, we will administer a questionnaire to the students to determine their satisfaction with this form of instruction. If the response is positive, we will offer additional classes using videoconferencing where the host sites have appropriate equipment available.

- 2. d. Design and conduct student knowledge and skills assessments for each class using a collection and reporting system approved by NLM (e.g., ViewletQuiz; SurveyMonkey). NLM must review and approve assessment tools prior to use by the contractor;
- 2. e. Design and conduct assessments of student satisfaction with each class;

As with the e-learning hybrid classes, an evaluation plan will be developed using the Kirkpatrick Model (see Statement of Work #1).

Currently, the NTCC is using assessment tools for the in-person classes at Level 1 (student satisfaction) and Level 2 (knowledge and skills assessment). Level 1 assessments are conducted using a modified version of the MLA class evaluation form, with some NLM approved changes.

Level 2 assessments are conducted using a pre- and post-test. We will design similar Level 1 and 2 assessments for the in-person classes, and administer them with approval from NLM. The pre- and post-test questionnaires will be developed using Qarbon ViewletBuilder. Following current practice, they will be administered ten business days before the class and ten business days following the class.

We will conduct a Level 3 assessment for all sessions of the e-learning and in-person classes in Year 2 of the contract. The assessment will be designed with the assistance of the OERC and NLM. This assessment will be sent to students who have given us permission to follow up with them after the class. We will use this assessment to find out if students improved their search skills and information retrieval, and if they returned to their institutions to teach others.

In Year 5 of the contract, we will work with OERC and NLM to design a Level 4 research study to look at return on investment and business results from participating in the NTC classes.

We will compile the results of the Level 3 and Level 4 evaluations, and submit them for presentations and publications with national organizations and journals. In Year 1, we will apply for an Institutional Review Board (IRB) exemption for publication of the results of the Level 3 and Level 4 evaluations.

In addition, with approval from NLM, the NTC will develop a peer-review system for evaluating in-person classes. It will be modeled on the MLA peer-review class evaluation system, in which peer reviewers attend the class and rate the class based on pre-established criteria (knowledge of instructor, organization of the class materials, use of appropriate teaching methods, etc.). Peer reviews will be conducted once a year for both the PubMed and TOXNET and Beyond class.

All evaluation and assessment results will be reported to NLM along with specific recommendations for improving learning outcomes and student satisfaction (see Statement of Work #5). We will work with NLM to ensure that assessment and evaluation results are part of a continuous feedback loop that will inform improvements to the in-person classes.

2. f. Provide NLM with a class roster, any relevant raw data not submitted to the reporting system, and a summary report of the training activity within two weeks following each class.

Student satisfaction assessments and student knowledge and skills assessments will be submitted to NLM within two weeks following the completion of in-person classes. We will provide NLM with any relevant raw data not submitted to the reporting system as well as a summary report of the training activity within two weeks following each in-person class.

Performance Measures:

- ~~At least twenty in-person classes are offered per year.~~ **At least 13 in-person classes are offered in Year 1; at least twenty in-person classes are offered in Year 2, budget permitting.**
- ~~One in-person class at a professional health organization conference is offered per year beginning in Year 2.~~
- ~~One in-person class at a public health association conference is offered per year beginning in Year 2.~~
- The in-person class schedule reflects equitable geographic distribution.
- The 1.5 day PubMed class is offered as a blended class (combined in-person and e-learning).

- One in-person class presented as a video conference with two trainers, one at a remote site, is offered each year.
- Over 75% of in-person class participants indicate that they are “Very Satisfied” with the class.
- Over 75% of in-person class participants indicate that the sessions met the learning objectives.
- Over 75% of in-person class participants increase their knowledge and skills based on the pre- and post-test scores.
- Over 50% of in-person class participants responding indicate in a follow-up questionnaire that they have improved their information retrieval skills as a result of the classes.
- All information required by NLM for each instructional session is sent within two weeks of the event.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Deliver at least 13 (Year 1) and 20 (Year 2) in-person classes each year at selected training sites; class offerings will be the 1.5 day PubMed class and the 1 day TOXNET and Beyond class.	X	X	X	X	X
Register students for the classes using the online registration system.	X	X	X	X	X
Conduct one peer review of the PubMed and TOXNET and Beyond classes per year.	X	X	X	X	X
Review current assessment tools with NLM and revise as needed; administer assessments, compile results, and report to NLM after each session.	X	X	X	X	X
Offer the pilot in-person class using classroom	X				

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
videoconference technology.					
Deliver one class at a health professional organization conference.		X	X	X	X
Deliver one class at a public health association conference.		X	X	X	X
Offer at least one in-person class using classroom videoconference technology.		X	X	X	X
Work with NLM to deliver one 1.5 PubMed class as a blended in-person and e-learning class; if this is successful, increase the number of PubMed classes offered as blended classes.		X	X	X	X
Conduct a Level 3 follow-up assessment with NLM's approval.			X		X
Conduct a Level 4 follow-up assessment with NLM's approval.					X
Submit results of Level 3 and Level 4 assessments to a journal for publication.				X	X

Statement of Work #3

Statement of Work

3. Submit a tentative schedule for all training (both in-person and e-learning) by June 30th of each contract year in collaboration with NLM;

Objective & Rationale:

Objective:

In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods.

Rationale:

In order to plan for trainer time and promotion of classes, the NTC will provide NLM with a tentative schedule of both in-person and e-learning training by June 30th of each contract year.

Outcome:

- Class participants develop the skills and knowledge needed to improve access to biomedical information.

Approach and Methodology:

3. Submit a tentative schedule for all training (both in-person and e-learning) by June 30th of each contract year in collaboration with NLM;

In collaboration with NLM, the NTC will develop tentative schedules for in-person classes and e-learning offerings by June 30th of each contract year.

For in-person classes, the NTC staff will identify appropriately equipped training labs and secure cooperation of individual institutions willing to host a class. We will work with a contact at the host institution to provide local arrangements. Two NTC trainers will be available for both in-person and distance offerings.

Once the schedule has been finalized, we will make it available on the NTC web site and begin promotion plans for upcoming offerings (see Statement of Work #4).

See Appendix B for a tentative in-person class schedule for Year 1 and Year 2.

Performance Measures:

- NLM receives a tentative schedule of in-person and e-learning classes by June 30th of the contract year.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Plan in-person and e-learning schedules in collaboration with NLM by June 30 th of each contract year.	X	X	X	X	X
Assign trainers to the in-person and e-learning classes.	X	X	X	X	X

Statement of Work #4

Statement of Work

4. Develop marketing and promotion strategies connected with all activities and products (e.g., announcements on appropriate Web sites, ListServes, social networking, etc.) with NLM approval;

Objective & Rationale:

Objectives:

Utilize a variety of communication mechanisms, including social networking sites, to promote NTC activities.

Regions can find and use the materials on delivery methods and best practices to improve their own instructional resources.

Rationale:

Communication with the RMLs and other audiences served by the NTC is critical to the success of the NTC's activities. Communication will be frequent and repeated using a variety of mechanisms. Message recipients may need to receive a message up to seven times before the message is recalled.¹⁷

Traditional communication methods, such as the NTC web site and RML and MLA listservs, will be supplemented with new social networking tools such as Facebook, Twitter, and Delicious. This will allow the NTC to reach users "where they already are."¹⁸

Outcomes:

- Learners receive instruction related to NLM products and services using the delivery method that best fits their needs.
- The RMLs see NTC as a leader in providing information about educational best practices.

¹⁷ Miller, G. A. (1956). "The magical number seven, plus or minus two: Some limits on our capacity for processing information". *Psychological Review* **63** (2): 81-97.

¹⁸ Qualman, Erik. *Socialnomics: How Social Media Transforms the Way We Live and Do Business*. Wiley, 2009.

Approach and Methodology:

4. Develop marketing and promotion strategies connected with all activities and products (e.g., announcements on appropriate Web sites, ListServes, social networking, etc.) with NLM approval;

The NTC will develop effective and relevant marketing and promotion strategies for all training activities.

PROMOTION PLAN

In Year 1 of the contract, the NTC will design a promotion plan for approval by NLM. NTC will use a variety of communication mechanisms to push out messages related to:

- Announcements of upcoming in-person and e-learning training opportunities.
- Links to self-paced tutorials about NLM products (with NLM approval).
- Links to information about NLM products (with NLM approval).
- Availability of re-usable learning objects for import into course management systems.
- Links to resources about educational best practices, including instructional design and adult learning principles.

The plan will describe the following:

- Targeted population.
- Frequency of messages.
- Delivery mechanism for communication.
- Types of information to be communicated.

Methods of communication will include:

- *Listserve*s: we will send announcements to the RML and MLA listservs.
- *News Blog*: we will create a news and announcements blog on the NTC web site. The blog will use WordPress, which is available through nnlm.gov. Users may subscribe to blog content through an RSS news feed reader such as Google Reader.

- *Twitter*: we will create an NTC Twitter page for frequent, short (140 characters) announcements and links to resources. The Twitter account will “follow” the Twitter accounts of other NIH agencies, RMLs, and librarian organizations. Organizations that follow us back will “re-tweet” our messages, allowing us to reach people within those organizations.
- *Facebook*: we will create an NTC Facebook “fan page.” Content for the Facebook page will automatically be re-purposed from the blog and Twitter accounts using programs available on the web. Pictures of NTC activities, with permissions from the participants, will also be posted.
- *Delicious social bookmarking*: we will use the Delicious social bookmarking site (<http://www.delicious.com>) to save links to web resources related to educational technology, adult learning, and instructional design principles. Each resource will be indexed with keywords or “tags.” A “tag cloud” showing the most popular tags for the resources will be published on the NTC web site. We will invite RML staff members to add resources.
- *CiteULike references*: we will use the CiteULike web site (<http://www.citeulike.org>) to share references to scholarly papers of interest related to educational technology, adult learning, and instructional design principles. We will create a CiteULike group and invite RML staff members to add papers to the group.
- *RML newsletter articles*: the NTC will volunteer to write articles about adult learning, instructional design best practices, and new technologies for delivering instruction for the RML newsletters.
- *RML regional Adobe Connect presentations and All-RML monthly conference calls*: the NTC will volunteer to present at regional Adobe Connect updates (for instance, MCR’s monthly “Breezing Along with the RML” session or PSR’s monthly “Midday at the Oasis” sessions) as well as to the All-RML monthly conference calls. Possible topics include adult learning, instructional design best practices, new technologies for delivering instruction, and methods for assessing learning. With prior approval from NLM, we may also present updates and “tips and tricks” regarding NLM databases.

The Facebook, Twitter, and Delicious pages are publicly available. Users with accounts on those services will be able to send messages and give feedback to the NTC, providing an important two-way communication mechanism between the NTC and its users.

It is likely that new web 2.0 services may be available by Year 1 of the contract, and we will evaluate those services and add them to the plan as appropriate.

IN-PERSON CLASS MARKETING AND PROMOTION

NTC will collaborate with the RMLs and local host sites to develop a promotion plan appropriate for the host site. The goal of the marketing activities is to fill the class and to reach new potential learners. The marketing activities will be adjusted each year as we determine which techniques have been successful in bringing an audience to the class.

Health sciences librarians, who will participate in the class and then train others, remain the primary audience of the NTC. Classes are, however, also appropriate for health sciences professionals, public librarians, and the public health workforce. The NTC will work with the RML staff to determine appropriate contacts for these groups; if the RML staff wishes, NTC staff will personally communicate with the contact person.

The NTC staff will also send marketing messages to the RMLs that they can forward to listservs for health sciences librarian consortia, public or state librarians, local public health associations, or local health professional associations.

COMMUNICATION WITH NN/LM

It is important that the NTC staff stay abreast of developments within the Network and also has opportunities to provide information about NTC's activities to NN/LM colleagues. The NTC staff will participate in NN/LM meetings and conference calls including:

- Outreach/Education monthly conference call.
- Web-STOC monthly update conference call.
- OERC monthly update conference call.
- Director's meeting held prior to MLA and at mid-year.
- Web-STOC Developer meeting held prior to MLA.
- All-RML monthly conference calls.

In addition NTC staff will participate in the weekly Adobe Connect staff meetings held by the MidContinental Region in order to test marketing ideas on an RML and understand how the operations of an RML can be incorporated in the NTC's marketing plan.

The NTC team will also informally monitor developments and receive feedback within the NN/LM through personal contacts with the Education Coordinators and other RML staff. In Years 2 and 4, we will send a questionnaire to RML colleagues to determine if the educational best practices postings have been useful to them in their work.

PROFESSIONAL ACTIVITIES

NTC staff will submit proposals for presentations and posters at national meetings such as the annual meeting of the Medical Library Association (MLA). We will also submit articles for publication in library and educational technology journals. Topics may include new methods or best practices for e-learning, lessons learned while developing web-based tutorials, or assessment results based on Kirkpatrick's model.

Performance Measures:

- Postings to the news blog and social networking sites adhere to the frequency listed in the promotion plan.
- In-person and e-learning classes have adequate enrollment.
- At least one member of the NTC team submits an application to present a poster or paper at a professional meeting each year.
- RML colleagues who respond to a questionnaire indicate that NTC postings regarding educational best practices are useful to them.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Design a promotion plan describing methods and frequency of communication.	X				
Create the NTC news blog, Facebook page, Twitter page, and Delicious page.	X				
Implement the promotion plan, including frequent messages to listservs, the news blog, the Facebook page, the Twitter page, the Delicious page, and the CiteULike group.	X	X	X	X	X
Promote the in-person classes in conjunction with the RML.	X	X	X	X	X

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Write articles for RML newsletters and give presentations at the local RML Adobe Connect update sessions.	X	X	X	X	X
Attend monthly conference calls: Outreach/Education; Web-STOC; OERC; and all-RML.	X	X	X	X	X
Attend the Directors' meeting and Web-STOC Developer's meeting prior to MLA each year; attend the mid-year Directors' meeting.	X	X	X	X	X
Send a questionnaire to RML colleagues to determine if the educational best practices postings have been useful.		X		X	
Submit at least one presentation, poster, or paper per year to a national organization or journal.		X	X	X	X

Statement of Work #5

Statement of Work

5. Provide NLM with brief quarterly reports that include quantitative and qualitative analyses of the results of the student knowledge and skills and satisfaction assessments during that quarter and, as appropriate, specific recommendations for improving learning outcomes and student satisfaction. These reports are due no later than 30 days after the end of each quarter;

Objective & Rationale:

Objective:

In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods.

Rationale:

Annual and quarterly reports describing the assessment results of all activities are important to inform improvements in the training opportunities offered by NTC.

Activities will also be added to the NN/LM Outreach and Activity Reporting Form (OARF) system. Since we will train new populations outside of the RML staff, it is appropriate for the NTC data to be submitted to the OARF. We will use the OARF system to show the geographic distribution of the training participants and to track job function data of both online and in-person classes. This will provide NLM with valuable data about the training participants and assist the NTC with future program planning.

Outcome:

- Assessment results contribute to improved training offerings.

Approach and Methodology:

5. Provide NLM with brief quarterly reports that include quantitative and qualitative analyses of the results of the student knowledge and skills and satisfaction assessments during that quarter and, as appropriate, specific recommendations for improving learning outcomes and student satisfaction. These reports are due no later than 30 days after the end of each quarter;

NTC will report analyses of student assessments and include recommendations for improvement. We will provide NLM with brief quarterly reports, using the specified template, that include quantitative and qualitative analyses of the results of the student knowledge and skills and satisfaction assessments during that quarter and, as appropriate, specific recommendations for improving learning outcomes and student satisfaction. We will work with NLM to ensure that assessment and evaluation results are part of a continuous feedback loop that will inform improvements for all NTC offerings.

The reports will be submitted within 30 days after the end of each quarter.

We will submit data to the OARF system and run annual reports showing geographic distribution and job function data for both in-person and e-learning classes.

Performance Measures:

- Quarterly reports are submitted to NLM on time and with the complete information requested by NLM.
- OARF data is submitted in a timely fashion.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Prepare and submit quarterly reports to NLM within 30 days after the end of the quarter.	X	X	X	X	X
Submit OARF data within 2 weeks of the event.	X	X	X	X	X

Statement of Work #6

Statement of Work

6. Register all students for all sessions of the one-day UMLS Basics Course. NLM staff will develop the training materials and teach the UMLS classes;

Objective & Rationale:

Objective:

In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods.

Rationale:

The UMLS class is offered only at NLM in Bethesda and is taught by NLM staff. NTC will register students for the class using the NTC online registration system.

Outcome:

- Class participants develop the skills and knowledge needed to improve access to biomedical information.

Approach and Methodology:

6. Register all students for all sessions of the one-day UMLS Basics Course. NLM staff will develop the training materials and teach the UMLS classes;

The NTC online registration system (see Statement of Work #8) will be used to register students for the one-day UMLS Basics Class held in Bethesda, MD. The classes are scheduled by NLM.

Performance Measures:

- UMLS class participants successfully register using the NTC online registration system.

- UMLS instructors receive class lists and MLA CE certificates for each participant from the NTC staff.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Register students for the one-day UMLS Basics Class held in Bethesda, MD, using the NTC online registration system.	X	X	X	X	X
Produce class lists and MLA CE certificate.	X	X	X	X	X

Statement of Work #7

Statement of Work

7. Collaborate with MLA, NLM, NN/LM, and the NN/LM Web Services Technology Operator Center (Web-STOC) on MLA Educational Clearinghouse activities as it pertains to NN/LM RML and member library training materials in the MLA Educational Clearinghouse database and the MLA Educational Clearinghouse search interface (<http://cech.mlanet.org/>);

Objective & Rationale:

Objective:

RML and NN/LM member library CE classes and training products are reflected in the MLA Educational Clearinghouse.

Rationale:

The Educational Clearinghouse developed by the NTCC is a searchable database with links to web-based health education training materials (<http://nnlm.gov/ntcc/ch/index.html>). The Clearinghouse offers RML and member library staff a resource to list and locate training materials on particular topics and adapt them for use in their own classes. Additionally, any interested party may access and retrieve links to these materials for re-purposing. The Clearinghouse was previously managed by the NTCC and database records were stored on nnlm.gov servers.

In 2009, an agreement was reached between MLA, NLM, and the NTCC in which MLA would host the Clearinghouse on the MLANet web site. The NTCC Educational Clearinghouse will be merged into the MLA Educational Clearinghouse that is open to both MLA members and non-members. The MLA CORE Toolbox will remain on the MLANet web site; it is available only to MLA members. The NTCC agreed to continue to review NN/LM submissions to the new resource and to check links for those NN/LM resources twice per year.

Outcome:

- RML and NN/LM member library trainers adopt NN/LM developed materials as part of their own teaching activities.

Approach and Methodology:

7. Collaborate with MLA, NLM, NN/LM, and the NN/LM Web Services Technology Operator Center (Web-STOC) on MLA Education Clearinghouse activities as it pertains to NN/LM RML and member library training materials in the MLA Education Clearinghouse database and the MLA Education Clearinghouse search interface (<http://cech.mlanet.org/>);

The NTC will collaborate on MLA Educational Clearinghouse activities as they pertain to NN/LM RML and member library training material.

The current NTCC clearinghouse may be imported into the MLA Educational Clearinghouse in Year 5 of the current contract. At that time a process for submission and tagging of NN/LM records will occur.

~~We will review the progress of this project in Year 1 of the 2011 – 2016 contract period. If the records have not yet been imported into the MLA Educational Clearinghouse, we will review the current NTCC Clearinghouse records and turn off any outdated records. We will work with MLA to facilitate the transfer of records currently stored on the nlm.gov server. This will require mapping the fields in the NTCC Clearinghouse to those in the MLA Educational Clearinghouse; we will work with MLA to add fields or tags as needed.~~

~~If the NTCC records are available in the MLA Educational Clearinghouse in 2010-2011, the NTC staff will review the established practice for submitting and tagging NN/LM records in the MLA Educational Clearinghouse. At a minimum, records should be searchable by an “NN/LM” tag, perhaps in the “Course Type” field, which currently contains options such as “MLA AM Offerings,” and “Chapter Offerings.” We will work with MLA to make changes as needed.~~

It is our understanding that MLA will have finished the necessary changes to the MLA Educational Clearinghouse by February 2011. Following these changes, current NTCC staff and NLM staff will input the NTCC records into the MLA Educational Clearinghouse. We will therefore assume that no search status tags can be added after these changes are completed. We hope that at a minimum records will be searchable by an “RML Offerings” tag in the “Course Type” field, which currently contains options such as “MLA AM Offerings,” and “Chapter Offerings.”

Once the records are available in the MLA Educational Clearinghouse, the NTC will coordinate with the RMLs and MLA to ensure that:

- Clearinghouse records are accurate and up to date;

- NN/LM materials within the Clearinghouse are easily discoverable; and
- The Clearinghouse is regularly promoted to the RMLs, and, through the RMLs, to member libraries.

NTC staff will review the NN/LM submissions to the MLA Educational Clearinghouse, and will check links for those NN/LM resources twice per year. NTC will contact NN/LM authors with broken links in the Clearinghouse. If there is no response from the authors within 30 days, the NTC staff will recommend that the resource record(s) be turned off.

NTC will provide feedback from the RMLs about the usability and relevance of search results to MLA, and follow up with MLA to act on the feedback in a timely manner.

NTC will promote the resource to the RMLs through the communication channels described in Statement of Work #4. We will encourage the RMLs to promote the Clearinghouse to their member libraries, and offer to write newsletter articles or blog posts to help with the promotion.

NTC will develop a short screencast to promote the MLA Educational Clearinghouse database and to demonstrate for the RML staff and member libraries how to submit and search for NN/LM resources in the MLA Educational Clearinghouse. The NTC web site will include a prominent link to the Clearinghouse. Records describing the self-paced tutorials, re-usable learning objects, and “just-in-time” screencasts produced by the NTC will be entered into the Clearinghouse.

NTC staff will create an automated custom Google search to find new resources tagged as NN/LM. We will embed the search widget into the NTC web site for use by the RMLs and member libraries. The RMLs will be able to use this page to easily browse new Clearinghouse resources.

NTC will also work with the RMLs and Web-STOC to provide a secure area for RML staff to store and share course materials under development. Possibilities include using the NN/LM staff wiki or a collaboration tool such as SharePoint.

Performance Measures:

- NN/LM MLA Educational Clearinghouse records are reviewed twice a year.
- RML staff responding to a questionnaire in Year 3 indicates that they find the MLA Educational Clearinghouse useful for locating NN/LM training materials.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Promote the MLA Educational Clearinghouse as a resource for NN/LM training offerings to the RMLs.	X	X	X	X	X
Review the NN/LM submissions to the MLA Educational Clearinghouse, and check links for those NN/LM resources twice a year.	X	X	X	X	X
Publicize new NN/LM training materials added to the Clearinghouse to the RMLs.	X	X	X	X	X
Provide feedback about the Clearinghouse received from the RMLs and member libraries to MLA and follow up as appropriate.	X	X	X	X	X
Review the current status of the record transfer from the NTCC Clearinghouse to the MLA Educational Clearinghouse. If this has not been completed, work with Web-STOC, MLA and NLM to facilitate the import.	X				
Create a short screencast that shows how to submit and search for NN/LM records within the MLA Educational Clearinghouse.	X				
Create a custom Google search page on the NTC web site to allow users to easily browse new resources added to the Clearinghouse.	X				

Statement of Work #8

Statement of Work

8. Continue development and maintenance of the NLM Training Center Web site (<http://nnlm.gov/ntcc/index.html>);
 - a. The NTC Web site will include an online registration mechanism for all classes scheduled through the NTC;
 - b. Participate in usability studies on the NTC Web site, in collaboration with appropriate NN/LM Center staff;

Objective & Rationale:

Objectives:

The NTC web site reflects NTC's activities and services.

The web-based registration system is used to effectively and efficiently present class schedules and register class participants.

Rationale:

The NTC web site is our “face” to the world and as such must be attractive, easy to navigate, and clearly branded as an NN/LM Center. A seamless web-based registration process is critical for participants attending in-person and e-learning classes. A well-designed back-end database and registration management system also improves the efficiency of NTC administrative tasks and the ease with which class registration data can be analyzed.

Outcomes:

- The NTC web site and online registration system is intuitive.
- NTC staff and national class participants successfully utilize the regional web-based class registration system.

Approach and Methodology:

8. Continue development and maintenance of the NLM Training Center Web site (<http://nnlm.gov/ntcc/index.html>);

The NTC will develop and maintain the NLM Training Center web site and ensure that the web site meets Section 508 requirements.

The current NTCC web site will be updated to add new information and features:

- NTC quarterly and annual reports.
- Links to NTC's social networking pages (Facebook, Twitter, CiteULike, and Delicious).
- A news blog using nnlm.gov's version of Wordpress.
- Links to the self-paced web tutorials (including "just-in-time" screencasts and reusable learning objects).
- Links to recorded archives of hybrid classes and webinars.
- Links to videoconferencing facilities at NTC host training sites.
- Links and a customized Google search engine to the MLA Educational Clearinghouse (see Statement of Work #7).

The NTC Web Developer will receive an email once a week from a link checking program run by Web-STOC and will fix any broken links that appear on that list. The NTC staff will schedule a regular maintenance review of the web site once a year to check for outdated information.

The NTC web site will continue to utilize the nnlm.gov template so that the Center is clearly branded as part of the NN/LM. Web-STOC plans to eventually make a content management system (CMS) available so that it is easier for web site authors to edit web pages; NTC will adopt the CMS as soon as it is available.

8. a. The NTC website will include an online registration mechanism for all classes scheduled through the NTC;

NTC will adopt the current NTCC web-based registration system (<http://nnlm.gov/ntcc/classes/schedule.html>). We will utilize this system to register students for all NTC in-person classes and live e-learning events, and will continue to maintain and improve the system based on user feedback.

The system consists of an administrative interface and a public interface:

- The administrative interface allows trainers to add or edit class descriptions, host sites for in-person classes, and dates and times of individual classes. The interface utilizes simple web forms and does not require any technical knowledge on the part of the trainer. The administrative interface is available on the nnlm.gov staff wiki and requires a password to log on. All class information is stored in a MySQL database located on the nnlm.gov server.
- The public interface presents a schedule of classes to users. Users can click on the class information to see the class description, agenda and details about the class location. The schedule also includes online classes. The user registers for the class with a simple web form. After submitting the form, the registrant and the trainer receive confirmation emails. If the class registration is above the maximum number of allowable students, participants are placed on a waiting list. All registration information is stored on a MySQL database located on the nnlm.gov server.

Class Registration Form

Please fill in all fields.

First Name: required **Last Name: required**

Job Function: **Organization:**

Street Address: **City:**

State: **Zip:**

Phone (w/ area code): required **Fax:**

E-mail Address: required **Home ZIP (where you vote): required**

How did you hear about the class?

Web Page RML Newsletter

Word of Mouth Other

[PubMed@ class details](#)

Figure 4. Registration form in the national web-based registration system

The regional version of the web-based registration system allows users to view regional classes and NTC classes taught in that region in one screen view. The regional system allows users to search classes by location, region, sponsoring RML, and keyword. Users can also sort results by date, region, class name, or location. We will add these features to the NTC version of the registration system.

View Training Opportunities			
Search for all classes sponsored by the NN/LM, including classes held at the National Library of Medicine in Bethesda, MD, classes sponsored by the National Training Center and Clearinghouse , and regional classes.			
view results			
Keyword:	<input type="text"/> (Searches class name, description, and agenda; city/state; and instructor name)		
Limit results by:	Sponsoring RML/Center <input type="checkbox"/> National Training Center and Clearinghouse <input type="checkbox"/> Greater Midwest Region <input checked="" type="checkbox"/> MidContinental Region <input type="checkbox"/> Middle Atlantic Region <input type="checkbox"/> Pacific Southwest Region <input type="checkbox"/> South Central Region	Region <input type="checkbox"/> Bethesda <input type="checkbox"/> Greater Midwest <input type="checkbox"/> MidContinental <input type="checkbox"/> Middle Atlantic <input type="checkbox"/> New England <input type="checkbox"/> Pacific Northwest <input type="checkbox"/> Pacific Southwest <input type="checkbox"/> South Central <input type="checkbox"/> Southeastern Atlantic	Location <input type="checkbox"/> Online <input type="checkbox"/> Alabama(AL) <input type="checkbox"/> Alaska(AK) <input type="checkbox"/> Arizona(AZ) <input type="checkbox"/> Arkansas(AR) <input type="checkbox"/> California(CA) <input type="checkbox"/> Colorado(CO) <input type="checkbox"/> Connecticut(CT) <input type="checkbox"/> Delaware(DE)
Control-click to select or de-select multiple items			
Sort results by:	<input checked="" type="radio"/> Date <input type="radio"/> Offering region/center <input type="radio"/> Class name <input type="radio"/> Location		
<input type="button" value="Search"/> <input type="button" value="Clear"/>			

Figure 5. Public Interface of the regional web-based registration system: search for classes

Several regions also utilize the web-based registration system to register students for both regional classes and NTCC classes held in their region (see Statement of Work #9).

8. b. Participate in usability studies on the NTC Web site, in collaboration with appropriate NN/LM Center staff;

Web-STOC is planning a usability study of regional and Center web sites in the 2011 - 2016 contract. In Year 1, Web-STOC plans to propose a usability study for the national and regional web-based class registration system. ~~The class registration system has not previously undergone a usability review.~~

A usability study, conducted in 2007, tested use of the national registration system by the general public. As a result of the 2007 study, changes were made to the layout of the NTC site to enhance usability of the registration page, including edits to the overall site navigation and labeling. The study did not include the regional system or the back-end portion of the system that staff members use to input classes and manage class registrations.

We will propose to Web-STOC that the back end portion of national and regional web-based class registration system undergo a usability study as part of Web-STOC’s plans for a usability study in Year 1. NTC will work with Web-STOC and the contractor to identify appropriate tasks for the usability study.

Web-STOC will hire an outside contractor with expertise in usability studies to conduct the study. NTC will work with Web-STOC and the contractor to identify appropriate tasks for the usability study.

In Years 2-5, Web-STOC plans to conduct usability studies of regional and Center web sites. The NTC will participate in a usability study of the NTC web site during the year specified by Web-STOC.

The NTC staff will update or improve both the web site and public user interface of the registration system based on the results of the usability study.

Web-STOC also provides access to Google Analytics, which provides web site statistics such as number of page visits, geographic locations of visitors, amount of time spent on pages, and user search terms. NTC will review the Google Analytics data to determine usage patterns of particular web pages, and will update or maintain the site accordingly.

The NTC will conduct a focus group study in Year 3 to determine the usefulness of the NTC web site to the RML staff. Selected RML staff will be invited to participate in the focus group. The results of the focus group will be used to improve the content offered on the NTC web site.

Performance Measures:

- A questionnaire administered to class participants indicates that using the web-based registration system is a seamless process.
- A focus group study of RML staff indicates that the resources available on the NTC web site are useful to them in their work.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Add new information and features to the NTC web site.	X	X	X	X	X

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Maintain and update the NTC web site.	X	X	X	X	X
Maintain and update the NTC class schedule and registration system.	X	X	X	X	X
Participate in the web site usability review in the year determined by Web-STOC; update the web site based on the results.	X	X	X	X	X
Update the national web-based class registration with the search and sort features found on the current regional web-based class registration system.	X				
Participate in the web-based registration system usability study.	X				
Update the NTC web-based registration system to reflect the improvements suggested by the Web-STOC usability study.	X				
Begin using the content management system made available by Web-STOC to edit pages.		X			
Administer a questionnaire to class registration users to determine if the online registration process is seamless.		X			
Hold focus groups with selected RML staff to determine if the web site provides resources useful to them in their work.		X		X	

Statement of Work #9

Statement of Work

9. Participate and collaborate with RML staff on Web pages related to NTC training efforts (e.g., the National Training page) and apprise NLM of these activities;

Objective & Rationale:

Objective:

The web-based registration system is used to effectively and efficiently present class schedules and register class participants.

Rationale:

In 2007, MCR's Technology Coordinator began service as the shared Technology Coordinator for both the MidContinental Region and the Pacific Southwest Region (PSR). This pilot shared position was proposed to investigate the potential for the development of cross-regional technology projects and activities. To further the nature of inter-regional collaboration, the MCR/PSR Technology Coordinator assumed responsibility for creating a web-based class registration and scheduling system for both MCR and PSR. Ideally, the system would incorporate both regional classes and the NTCC classes held in each region. The previous methods used by MCR and PSR to register students required rebuilding an e-mail form each time a new class was announced, and then laboriously compiling the e-mails into a class registration spreadsheet.

The NTCC saw the idea of establishing a National Registration and Training page as a cost effective method of streamlining a time consuming and complex system. NTCC was most willing to work with PSR and MCR to adopt its web-based registration system to include the NTCC classes as well as regional classes. The MCR/PSR Technology Coordinator and the Associate Directors for MCR and PSR worked with the NTCC staff and the other Associate Directors to identify requirements for a regional system based on the NTCC programs. The NTCC programmer adjusted the web page programming and the back-end database so that each region could manage regional classes without additional programming. The public interface of the class schedule and registration retains the "branding" for each individual region even though it uses the NTCC programming in the background.

In 2009, MCR and PSR began successfully using the system. The system saves the regional web developer and the trainers a great deal of time. The trainer or the web developer can easily add classes to the database using a simple web form. The class appears immediately on the regional class schedule page. Users can see all of the classes

that will be held in the region, including the NTCC classes. Users can search for classes by region, sponsoring RML, keyword, or location.

Search Results				
Offered By	Class Name	Date	Site	Register
National Training Center and Clearinghouse	PubMed® (1 day) details	Wednesday May 12, 2010 8:30 AM PDT	Berkeley, CA	Register
National Training Center and Clearinghouse	PubMed® (1 day) details	Thursday May 13, 2010 8:30 AM PDT	Berkeley, CA	Wait List Only
National Training Center and Clearinghouse	TOXNET® and Beyond (1 day) details	Friday May 14, 2010 9:00 AM PDT	Berkeley, CA	Register
Pacific Southwest Region	Community Assessment Webinar (3 hours) details	Thursday May 27, 2010 1:00 PM PDT	Online	Register
Pacific Southwest Region	Podcasting for Advocacy (2 hours) details	Sunday June 6, 2010 10:00 AM PDT	Online	Register
Pacific Southwest Region	PubMed Clinics of North America (4 hours) details	Tuesday July 6, 2010 9:00 AM PDT	Downey, CA	Register

Figure 6. Pacific Southwest Classes, sorted by date, showing both NTCC and regional classes (both in-person and online)

Users complete a web form to register for classes. The trainer receives an email with the registration information, and the information is also saved in a database on the nnlm.gov server. The trainer can download a spreadsheet with the participants' information at any time. This makes it easy for the trainer to build e-mail lists for contacting students and to pull out zip codes for use in the Outreach Activities Reporting Form (OARF).

In 2010, the South Central Region (SCR) began to use the system. Other regions are planned as beta sites for later in 2010.

In addition to the public user interface, regions can use the system to identify particular areas of regional expertise and to collaborate on training related to specific topics.

Outcome:

- RML staff and regional class participants successfully utilize the regional web-based class registration system.

Approach and Methodology:

9. Participate and collaborate with RML staff on Web pages related to NTC training efforts (e.g., the National Training page) and apprise NLM of these activities; and

In Year 5 of the current contract, other regions besides MCR, PSR, and SCR can begin to use the regional class schedule and registration system. In Year 1 of the new contract, NTC will assess the use of the system and work with any remaining regions that wish to start using it.

NTC staff will hold quarterly meetings with at least one representative from each region using the system. Announcements about the system will also be incorporated into the monthly NN/LM Outreach/Education conference calls as appropriate. This will be an opportunity for regions to ask for improvements or request new system features. The implementation schedule for adding the improvements will depend upon the complexity of the programming needed. Improvements will also be made following the Web-STOC usability tests.

Web-STOC plans to transition the public web site, staff wiki, and internal systems to a content management system. We will work with Web-STOC to port the class registration system to the content management system once it is available. The use of the CMS will make it easier to maintain and update the system.

The NTC will maintain and update class registration system documentation on the NN/LM staff wiki.

The Web Developer will also respond to trouble tickets (reports of bugs or problems with the system requiring immediate attention) within 24 business hours after being notified of problems.

Performance Measures:

- NTC responds to trouble tickets regarding the regional class registration system within 24 business hours.
- RML staff utilizing the regional class registration system expresses satisfaction with the system.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Maintain the regional class schedule and registration system in collaboration with the regions; respond to trouble tickets within 24 business hours.	X	X	X	X	X
Maintain and update class registration system documentation on the staff wiki.	X	X	X	X	X
Add new features and make improvements to the regional class registration system based on feedback from regional representatives.	X	X	X	X	X
Work with any remaining regions that wish to use the regional class registration system.	X				

Statement of Work #10

Statement of Work

10. Participate in a review of the NTC by selected representatives from NLM and the RMLs.

Objective & Rationale:

Objective:

In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods.

Rationale:

Regular reviews by NLM and the RMLs are critical to help the NTC improve its activities and services. Internally, the NTC will utilize a logic model as a systematic method for planning its activities. The logic model will articulate the goals, objectives, activities, and desired outcomes of the NTC. It will also contain an evaluation plan that defines how success and impact will be measured. The MidContinental Region has successfully used a logic model to guide its work and to set forth the goals, objectives, outcomes, and measurable indicators of its activities. The logic model approach will allow the NTC to continually review its progress towards reaching the goals, objectives and outcomes set forth in this proposal.

Outcome:

- NTC activities and operations are improved based on participation in regular reviews from NLM and the RMLs.

Approach and Methodology:

10. Participate in a review of the NTC by selected representatives from NLM and the RMLs.

INTERNAL REVIEW: LOGIC MODEL

The NTC will develop a logic model to serve as a mechanism for regular internal review (see Appendix A). The logic model consists of: goals, objectives, outcomes, performance

measures, and activities. The logic model provides a “road map” that will be reviewed on a quarterly basis by the NTC team to determine progress towards meeting NTC goals. The logic model will be updated each year by the NTC team at an in-person planning meeting.

EXTERNAL REVIEW: ADVISORY GROUP

The NTC will form an advisory group consisting of two NTC staff, one member from each NN/LM region and Center and at least two NLM staff members. Advisory group members will serve 2-year terms. The group will meet twice a year via Adobe Connect. The NTC will improve its services and activities based on recommendations and feedback received from the advisory group. We will report the advisory group recommendations and subsequent action items to NLM.

EXTERNAL REVIEW: PARTICIPATE IN A SITE VISIT

Prior to the site review, we will prepare a report for NLM and NN/LM representatives to use during the review. We will host the site review meeting via Adobe Connect web conferencing, but will also request that NN/LM schedule the site review prior to or after the MCR site visit, so that NN/LM and NLM staff can attend the site visit in-person at the Spencer S. Eccles Health Sciences Library.

During the site visit, the NTC team will give a presentation outlining the progress towards the measurable indicators as outlined in the logic model as well as summarizing the results of the student satisfaction and skills assessment instruments. We will respond to questions from committee members during the presentation and submit a written report incorporating comments and suggestions offered during the presentation. Suggestions for improvement and feedback gathered during the site visit will be incorporated into the future operation of the NTC.

Performance Measures:

- Recommendations from the advisory group are incorporated into the activities and operations of the NTC.
- Recommendations from the site visit review are incorporated into the activities and operations of the NTC.

Schedule:

Task or event	Year 1	Year 2	Year 3	Year 4	Year 5
Develop an annual NTC logic model; review activities and success measures quarterly.	X	X	X	X	X
Identify individuals to serve as members of an Advisory Group for the NTC and invite their participation.	X				
Meet semi-annually with the Advisory Group via Adobe Connect to review Center plans and activities.		X	X	X	X
Incorporate suggestions for improvement from the Advisory Group into the future operations of the NTC.		X	X	X	X
Prepare responses to questions submitted by the NLM site review committee; participate in the site review when scheduled.			X		
Incorporate suggestions for improvement from the site review into future operations of the NTC.			X	X	X

Appendix A. Logic Model

Goal 1: To support the effective use of NLM information products and services by health sciences librarians, health professionals, and the public health workforce

Statement of Work	Objective	Outcomes	Summary of Activities
<p>1. The contractor shall create e-learning products for users of NLM systems. The products will be a combination of live training sessions (e.g., “Webinars”), and Web-based self-paced tutorials.</p>	<p>In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods</p>	<p>Class participants develop the skills and knowledge needed to improve access to biomedical information</p> <p>Learners receive instruction related to NLM products and services using the delivery method that best fits their needs</p> <p>RML trainers utilize re-usable learning objects created by the NTC in their online training</p> <p>E-learning instructional offerings are accessible to learners with disabilities</p>	<p>Develop and deliver hybrid classes (Adobe Connect and Moodle) for NLM Gateway / Clinical Trials.gov, PubMed, and TOXNET and Beyond</p> <p>Offer one-hour live Adobe Connect sessions on product updates and other topics of interest</p> <p>Offer one-hour live Adobe Connect sessions on adult learning principles, instructional design best practices, and authoring systems</p> <p>Form the NCBI database class committee and offer classes</p> <p>In consultation with NLM, conduct the self-paced tutorial needs assessment and prioritize topics for self-paced tutorials based on the results</p> <p>Develop, release and evaluate self-paced tutorials using the ADDIE model</p> <p>Package components of the self-paced tutorials as re-usable learning objects for import into course management systems</p> <p>Review current assessment tools with NLM and revise as needed; administer assessments, compile results, and report to NLM after each session</p> <p>Conduct the mobile learning pilot project and submit results to NLM; if successful, offer other mobile tutorials</p>

Statement of Work	Objective	Outcomes	Summary of Activities
<p>2. The contractor shall conduct at least 20 in-person classes each contract year for trainers of NLM systems. These classes will be on PubMed (1.5 days in length, totaling 11 hours of instruction) and TOXNET and Beyond (1 day in length, totaling 7.5 hours of instruction). NLM will develop the instructional materials for these in-person classes offered by the NTC and by NLM in Bethesda.</p>	<p>In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods. and other health professionals who conduct training on NLM resources.</p>	<p>Class participants develop the skills and knowledge needed to improve access to biomedical information</p>	<p>Deliver at least 13 (Year 1) and 20 (Year 2) in-person classes on PubMed and TOXNET at RML training sites, health professional conferences, and public health conferences</p> <p>Register students for the in-person classes</p> <p>Review current assessment tools with NLM and revise as needed; administer assessments, compile results, and report to NLM after each session</p> <p>Conduct peer review of classes</p> <p>Conduct videoconferencing pilot</p> <p>Conduct blended class (in-person followed by exercises using Moodle)</p>
<p>3. Submit a tentative schedule for all training (both in-person and e-learning) by June 30th of each contract year in collaboration with NLM;</p>	<p>In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods</p>	<p>Class participants develop the skills and knowledge needed to improve access to biomedical information</p>	<p>Plan in-person and e-learning schedules in collaboration with NLM by June 30th of the contract year</p>

Statement of Work	Objective	Outcomes	Summary of Activities
<p>4. Develop marketing and promotion strategies connected with all activities and products (e.g., announcements on appropriate Web sites, ListSrvs, social networking, etc.) with NLM approval;</p>	<p>Utilize a variety of communication mechanisms, including social networking sites, to promote NTC activities</p>	<p>Learners receive instruction related to NLM products and services using the delivery method that best fits their needs</p>	<p>Design a promotion plan describing methods and frequency of communication</p> <p>Implement the promotion plan, including frequent messages to listservs, the news blog, the Facebook page, the Twitter page, and the Delicious page</p> <p>Promote the in-person classes</p> <p>Attend NN/LM conference calls and meetings</p> <p>Submit at least one presentation, poster, or paper per year to a national organization or journal</p>
<p>5. Provide NLM with brief quarterly reports that include quantitative and qualitative analyses of the results of the student knowledge and skills and satisfaction assessments during that quarter and, as appropriate, specific recommendations for improving learning outcomes and student satisfaction. These reports are due no later than 30 days after the end of each quarter;</p>	<p>In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods</p>	<p>Assessment results contribute to improved training offerings.</p>	<p>Prepare and submit quarterly reports to NLM within 30 days after the end of the quarter.</p> <p>Submit data to and analyze results from the Outreach and Evaluation Reporting Form (OARF)</p>

Statement of Work	Objective	Outcomes	Summary of Activities
6. Register all students for all sessions of the one-day UMLS Basics Course. NLM staff will develop the training materials and teach the UMLS classes;	In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods	Class participants develop the skills and knowledge needed to improve access to biomedical information	Register participants for the one-day UMLS Basics Class held in Bethesda, MD.
7. Collaborate with MLA, NLM, NN/LM, and the NN/LM Web Services Technology Operator Center (Web-STOC) on MLA Educational Clearinghouse activities as it pertains to NN/LM RML and member library training materials in the MLA Educational Clearinghouse database and the MLA Educational Csearch interface (http://cech.mlanet.org/);	RML and NN/LM member library CE classes and training products are reflected in the MLA Educational Clearinghouse.	RML and NN/LM member library trainers adopt NN/LM developed materials as part of their own teaching activities.	<p>Work with MLA and NLM to facilitate adding records to the MLA Educational Clearinghouse.</p> <p>Create an short screencast that shows how to submit and search for NN/LM records within the MLA Educational Clearinghouse</p> <p>Create a custom Google search page on the NTC web site to allow users to easily browse new resources added to the MLA Educational Clearinghouse</p> <p>Promote the MLA Educational Clearinghouse as a resource for NN/LM training offerings to the RML and member libraries</p> <p>Review the NN/LM submissions to the MLA Educational Clearinghouse, and will check links for those NN/LM resources twice per year.</p> <p>Publicize new NN/LM training materials added to the MLA Educational Clearinghouse to the RMLs and member libraries</p>

Statement of Work	Objective	Outcomes	Summary of Activities
<p>8. Continue development and maintenance of the NLM Training Center Web site (http://nmlm.gov/ntcc/index.html);</p>	<p>The NTC web site reflects NTC's activities and services</p> <p>The web-based registration system is used to effectively and efficiently present class schedules and register class participants</p>	<p>The NTC web site and online registration system is intuitive</p> <p>NTC staff and national class participants successfully utilize the regional web-based class registration system</p>	<p>Add new information and features to the NTC web site in Year 1.</p> <p>Maintain and update the NTC web site and class schedule and registration system.</p> <p>Update the national web-based class registration with the search and sort features found on the current regional web-based class registration system.</p> <p>Participate in the web site usability review in the year determined by Web-STOC; update the web site and class registration system to reflect the improvements suggested by study.</p>
<p>9. Participate and collaborate with RML staff on Web pages related to NTC training efforts (e.g., the National Training page) and apprise NLM of these activities;</p>	<p>The web-based registration system is used to effectively and efficiently present class schedules and register class participants</p>	<p>RML staff and regional class participants successfully utilize the regional web-based class registration system</p>	<p>Work with any remaining regions that wish to use the regional class registration system to bring the system live for them</p> <p>Maintain the regional class schedule and registration system in collaboration with the regions; respond to trouble tickets within 24 business hours</p> <p>Maintain and update class registration system documentation on the staff wiki</p> <p>Add new features and make improvements to the regional class registration system based on feedback from regional representatives</p>

Statement of Work	Objective	Outcomes	Summary of Activities
10. Participate in a review of the NTC by selected representatives from NLM and the RMLs.	In collaboration with NLM, provide high-quality instructional offerings to health sciences librarians, public librarians, health professionals, and the public health workforce through a variety of delivery methods	NTC activities and operations are improved based on participation in regular reviews from NLM and the RMLs	Utilize a logic model for yearly planning and success measures Form an NTC Advisory Group and meet by Adobe Connect Meet semi-annually with the advisory group via Adobe Connect to review Center plans and activities Incorporate suggestions for improvement from the advisory group into the future operation of the NTC Incorporate suggestions for improvement from the Advisory Group and site review into the future operation of the NTC

Goal 2: To provide leadership to the NN/LM regions related to e-learning delivery methods and instructional best practices for adult learners

Statement of Work	Objective	Outcomes	Summary of Activities
4. Develop marketing and promotion strategies connected with all activities and products (e.g., announcements on appropriate Web sites, ListSrvs, social networking, etc.) with NLM approval;	Regions can find and use the materials on delivery methods and best practices to improve their own instructional resources	The RMLs see NTC as a leader in providing information about educational best practices	Post frequent messages about instructional best practices and e-learning delivery methods using social networking tools Participate in NN/LM conference calls and meetings Submit at least one presentation, poster, or paper per year to a national organization or journal

Statement of Work	Objective	Outcomes	Summary of Activities
<p>7. Collaborate with MLA, NLM, NN/LM, and the NN/LM Web Services Technology Operator Center (Web-STOC) on MLA Educational Clearinghouse activities as it pertains to NN/LM RML and member library training materials in the MLA Educational Clearinghouse database and the MLA Educational Csearch interface (http://cech.mlanet.org/);</p>	<p>RML and NN/LM member library CE classes and training products are reflected in the MLA Educational Clearinghouse.</p>	<p>RML and NN/LM member library trainers adopt NN/LM developed materials as part of their own teaching activities.</p>	<p>Work with MLA and NLM to facilitate the import of records.</p> <p>Create an short screencast that shows how to submit and search for NN/LM records within the MLA Educational Clearinghouse</p> <p>Create a custom Google search page on the NTC web site to allow users to easily browse new resources added to the MLA Educational Clearinghouse</p> <p>Promote the MLA Educational Clearinghouse as a resource for NN/LM training offerings to the RMLs and member libraries</p> <p>Review the NN/LM submissions to the MLA Educational Clearinghouse, and will check links for those NN/LM resources twice per year.</p> <p>Publicize new NN/LM training materials added to the MLA Educational Clearinghouse to the RMLs and member libraries</p>

