



Advancing Online Public Health Training Systems: Challenges and Opportunities

October 2016

Abstract. A substantial body of studies documents the increasing need for continuous, competency- and evidence-based learning that meets the pragmatic, skills-based needs of the changing public health workforce. Online learning has proven effective in addressing professional training and continuing education needs. A range of online learning systems have arisen to facilitate translation of knowledge from online courses to learner—in public health, healthcare, education, and the private sector.

Completed for the Public Health Learning Network, this report provides the first step in reviewing the current landscape of online public health learning systems, identifying components of systems that are effective in making learning more efficient, and providing promising practices to emulate in modernizing the nation's public health training delivery system.

Support for this work was provided by the National Coordinating Center for Public Health Training (NCCPHT). The NCCPHT is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number 1 UB6HP274350100, Affordable Care Act (ACA) Public Health Training Centers, for grant award of \$3,384,657, comprised of 100% Federal funds. This information or content and conclusions are those of NNPHI and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.



**National Center for Education
in Maternal and Child Health**
Georgetown University



ABOUT THE AUTHORS

JOHN RICHARDS, a research professor in the McCourt School of Public Policy, currently serves as Principal Investigator for the MCH Navigator and the HealthCheck Training and Resource Center. He has led 5 distance learning grants over the past 18 years. He received Georgetown University's President's Excellence Award for "expertise in technology, discipline-specific knowledge, and creativity in product development" and HRSA's Young Leadership Award for "significant contributions to Maternal and Child Health (MCH)." He has helped HRSA/MCHB develop national performance measures for distance learning and workforce development and has authored over 20 online curricula and articles on eLearning.

ROCHELLE MAYER, a distinguished research professor in the McCourt School of Public Policy, has led the National Center for Education in Maternal and Child Health (NCEMCH) since 1986, and served as Principal Investigator for the Commonwealth Fund Project on Pediatric Care Linkages and the National Consortium to Advance Education and Public Policy Development. She received HRSA's Administrator's Citation "for building an outstanding information resource to expand knowledge in the MCH community throughout the Nation." The hallmark of Dr. Mayer's leadership is her dedication to advancing MCH through partnership.

SUSAN BRUNE LORENZO has spent over two decades as a researcher and librarian at NCEMCH, and is the author of NCEMCH's knowledge paths. She serves as project lead for the National Action Plan to Promote Safe Sleep (NAPPSS), a coalition of partners to reduce infant mortality by making safe sleep and breastfeeding a national norm.

KEISHA WATSON has led evaluations of national HRSA-funded initiatives, including grants funded under the HIV/AIDS Bureau and MCHB. She provides consultation to state public health agencies on professional development. Her research focuses on self-efficacy in health-seeking behaviors and health services program evaluation

Acknowledgements. The authors would like to thank special advisors Cynthia Lamberth, MPH, CPH, Co-Director of the Kentucky Population Health Institute and Kathleen Wright, EdD, MPH, Associate Professor, Louisiana State University. This report would not have been possible without the guidance and support of Jennifer McKeever, Dorothy Evans, Chris Kinabrew, and Mikhaila Richards of NNPHI. We are also indebted to the key informants and members of the public health workforce whose insights and experiences form the basis of this monograph.

Cite as: Richards J, Mayer R, Lorenzo SB, Watson, K. 2016. *Advancing Online Public Health Training Systems: Challenges and Opportunities*. Washington DC: National Center for Education in Maternal and Child Health; for the National Network of Public Health Institutes.

Appendices: Please contact training@nnphi.org to access full appendices, including survey and key informant interview instruments.



CONTENTS

Executive Summary 4

I. Introduction 8

II. Topology and Topography of Online Learning Systems 10

III. Methodology 13

IV. Findings 14

V. Recommendations 30

 A. Recommendations to Advance Standards (Tools)..... 32

 1. Utilize quality standards, competencies, and adult learning principles.

 2. Formalize vetting protocols.

 3. Improve technical standards and navigation.

 4. Develop standard course descriptions.

 B. Recommendations to Advance Coordination (Partners) 36

 1. Standardize data collection, reporting, and evaluation.

 2. Simplify registration and login.

 3. Coordinate marketing and communication activities.

 4. Provide comprehensive reference services.

 C. Recommendations to Advance Systems (Infrastructure)..... 40

 1. Increase access to continuing education.

 2. Support a community of learners approach to learning.

 3. Incorporate a system to match learner needs to appropriate learning opportunities.

 4. Develop a curated portal to prove a course catalog and services for online learning.

VI. Discussion of Issues and Next Steps 46



EXECUTIVE SUMMARY

INTRODUCTION. A substantial body of studies document the increasing need for continuous, competency—and evidence-based learning that meets the pragmatic, skills-based needs of a changing public health workforce. Online learning has proven effective in addressing professional training and continuing education needs. A range of online learning systems have arisen to facilitate translation of knowledge from online courses to learner—in public health, healthcare, education, and the private sector.

The National Coordinating Center for Public Health Training (NCCPHT) at the National Network of Public Health Institutes partnered with the NCEMCH at Georgetown University to conduct a rapid and comprehensive environmental scan to develop a complete picture of delivery and dissemination systems for public health training with the overarching goal of developing a strategy to better connect public health practitioners with training, tools, and resources to advance public health practice.

This report describes those efforts by summarizing an environmental scan of 70 online public health learning systems, an online survey of 90 public health professionals, and 20 key informant interviews with leaders from the field (gathered from 15 separate interviews and written responses). The report highlights 50 findings that emerged from the study and presents a set of 12 recommendations. Specifically, the report:

- Describes the context in which public health professionals access learning.
- Provides a typology of the online learning systems currently in the field and elsewhere.
- Identifies key findings to support the successful provision of online learning.
- Puts forth recommendations and next steps for improving online learning for the diverse professionals that make up the public health workforce.

FINDINGS. Key findings from the environmental scan of online training systems, a survey, and key informant interviews are summarized as follows:

A. Environmental Scan Findings

1. Findings Related to Technical, Quality, and Procedural Information

- 1.1 The most engaging sites contained advanced features such as an identifiable learning management system (LMS), integration with other sites, and social media.
- 1.2 There were popular categories of learning opportunities: archived webinars, recorded audio/video presentations with slides, and video trainings were the most abundant.
- 1.3 Most sites required registration and login of some form.
- 1.4 Few sites had detailed technical and logistic information, including accessibility.
- 1.5 Few sites explained quality and currency standards, while most sites indicated that quality and timeliness of learning materials were important.

2. Findings Related to Content Description/Organization and Continuing Education

- 2.1 An equal number of sites provided access to their own content, content linked to from other sites, and a combination of materials developed in-house and elsewhere.
- 2.2 Well-developed sites typically included annotations of trainings, and to a lesser degree, learning objectives.
- 2.3 Despite much emphasis found on sites related to competency-based learning and adult learning principles, few systems routinely track trainings to these ideals.
- 2.4 Continuing education was offered to a lesser extent than would have been expected.



3. Findings Related to Critical Site Features

- 3.1 Advanced organizational systems were critical for effective training systems.
- 3.2 Many learning systems have active newsletters and social media presences to disseminate training information.
- 3.3 Most systems did not include instructions on how to use their website.
- 3.4 Course rating systems were identified as a “high-end” feature on several learning systems.
- 3.5 The ability to search for trainings was prevalent in more advanced systems.
- 3.6 Information on training modality also was observed in robust systems.
- 3.7 Supplemental resources were included in some systems, but not consistently across the spectrum.
- 3.8 The ability for learners to ask questions and/or receive technical assistance (TA) was present in many learning systems, but often was not prominently featured.
- 3.9 Learner self-assessments and other tools to assist users in identifying their learning needs were surprisingly lacking across systems.
- 3.10 Online communities of learners were sparse, despite feedback from the field that communal learning was important.

B. Online Learner Survey Findings

1. Findings Related to Quantitative Data

- 1.1 Respondents showed an appreciable interest in online learning, knew where to find trainings, and preferred a variety of training modalities.
- 1.2 The demographics of the survey sample aligned with what is known about the public health workforce.

2. Findings Related to Qualitative Data

2.1 General Findings

- 2.1.1 Many users are satisfied with the quality of online training from trusted sources, and usually rely on external guidance to find quality learning opportunities.
- 2.1.2 Learners presented clear convictions of components that comprise quality online trainings.
- 2.1.3 Learners indicated that they are most comfortable with taking trainings when the description of content provides credible, relevant information.

2.2 Findings Related to Issues/Barriers

- 2.2.1 The most consistent issue reported when users had to search for their own trainings was a “clutter” of too many courses, often with duplication of topics across multiple systems and no easy way to determine quality.
- 2.2.2 Incomplete information on individual trainings was cited as an ongoing issue.
- 2.2.3 There was considerable frustration expressed with registrations, especially multiple registrations and difficult, time-consuming processes.
- 2.2.4 There was still considerable difficulty with technology issues and security barriers to access online trainings.
- 2.2.5 Users expressed that site organization and search features needed to be improved and that site maintenance was an important issue.
- 2.2.6 Other issues were identified as barriers to online learning.



2.3 Findings Related to Promising Practices

- 2.3.1 The desire for a “one-stop shop” to provide access to high quality public health training emerged.
- 2.3.2 Respondents wanted to have a sense of the quality of the training before pursuing it further.
- 2.3.3 Learners expressed a definite need for more continuing education opportunities.
- 2.3.4 Respondents provided many pieces of specific advice, best summarized in wish lists.

C. Key Informant Interview Findings

1. Findings Related to the Landscape of Public Health Training

- 1.1 The development of a best-in-class online public health training system requires collaboration and investment from major stakeholders.
- 1.2 Public health online training is “under construction.”

2. Findings Related to Current Challenges

- 2.1 The quality of online training is a major issue, and the effort to define and apply quality standards is critical.
- 2.2 Clutter—the overwhelming volume of online courses without a clear pathway to finding the best (most relevant, up-to-date, accurate) content—is a critical barrier.
- 2.3 Duplication of effort is pervasive.
- 2.4 The need to customize training based on local requirements is an ongoing reality.
- 2.5 New and different content is needed to address cross-cutting competencies for a changing workforce.
- 2.6 LMSs should be more user-friendly.
- 2.7 Ideas abound for improving LMSs.
- 2.8 Collecting and reporting are essential functions of LMSs.
- 2.9 Self-assessment is a highly desirable feature of an exemplary LMS.
- 2.10 Learning communities are important to the e-learning experience.
- 2.11 Training is needed in different formats for different learning needs.
- 2.12 Look to corporate examples of online training.
- 2.13 Marketing and branding are important for learners to remember the LMSs in the national learning network.
- 2.14 Workgroups should be tapped for ongoing advice.

3. Advice from the field. Thoughtful suggestions from public health professionals in the field and the developers of online training systems were collected and aggregated by topic area into “wish lists” for online learning, course developers, and the work environment using the online survey and the key informant interviews. In addition, a list of suggestions for coordination and collaboration was compiled to further guide ongoing development of systems that provide training to the workforce.

RECOMMENDATIONS AND DISCUSSION. The final two sections of the report present 12 recommendations in 3 thematic areas to advance standards, coordination, and systems in the larger context of improving an online system to provide training for public health practitioners. Each recommendation includes further discussion and promising practices to use as examples:



A. Recommendations to Advance Standards (Tools)

- A.1 Utilize quality standards, competencies, and adult learning principles.
- A.2 Formalize and standardize quality vetting protocols.
- A.3 Improve technical standards and navigation.
- A.4 Develop standard course descriptions.

B. Recommendations to Advance Coordination (Partners)

- B.1 Standardize data collection, reporting, and evaluation.
- B.2 Simplify registration and login requirements.
- B.3 Coordinate marketing and communication activities.
- B.4 Provide comprehensive reference services.

C. Recommendations to Advance Systems (Infrastructure)

- C.1 Increase access to continuing education.
- C.2 Support a community of learners approach to learning.
- C.3 Incorporate a system to match learner needs to appropriate learning opportunities.
- C.4 Develop a curated portal to provide a course catalog and services for online learning.

The discussion section includes description of a phased approach at local or course developer, state, and national levels to improve online learning for the public health workforce.

ONLINE TOOLKIT. To augment findings presented in this report, an online toolkit has been developed and is available at <http://ncemch.org/toolkits-training/training-systems.php>. It includes a series of Choose-and-Use guides that allow searching the 70 online learning systems by category, technical details, site features, and continuing education formats. Note that details in the Choose-and-Use guides are based on *user observation* from the scan conducted in May 2016 and may not include features that are not immediately visible on each website or are added after May 2016.

Note: Please email training@nnphi.org to request access to the online toolkit.



I. INTRODUCTION

Overview of the problem. The U.S. Department of Health and Human Services states that the “current public health workforce is inadequate to meet [U.S.] health needs and shortages are projected to reach 250,000 by 2020. Since much of the public health workforce is employed at the state and local level, this group has been particularly impacted by the economic downturn and shrinking state budgets.”¹ This statement draws into focus the findings of a recent needs assessment: “workforce development needs [are] made urgent in a severe economic downturn, with state budgets strained and public health agencies furloughing staff that are already stretched to their limits.”²

Data from the Association of State and Territorial Health Officials (ASTHO) 2014 Public Health Workforce Interests and Needs Survey (PH WINS) suggest that the public health workforce needs to be increasingly skilled in competency-based topics that are “underrepresented in governmental agencies” and needs to be trained on core professional leadership competencies to be more “politically savvy, innovative, adaptive, and motivated” amidst a quickly evolving landscape of health systems change, health care reform, increasing emphasis on partnerships, accreditation of public health agencies, and greater public health attention to social determinants of health.² PH WINS data indicate that “there exists an urgent need to enhance management and leadership skills [through] increased training of the public health workforce.”³ In response to PH WINS, the Health Resources and Services Administration (HRSA) has stated that the nation’s limited public health resources should be “effectively directed to address issues of highest impact...such as real-time/on-the-job/just in time learning.”⁴

These studies are reinforced by government support and policy. HRSA’s strategic plan (2016–2018) includes a broad goal on strengthening the health workforce (goal 2) and an objective (2.1) on advancing the competencies of the healthcare and public health workforce by supporting curriculum development, training, and TA to provide high-quality, culturally and linguistically appropriate services. A recent G20 report broadly supports HRSA’s plans. It states, “equipping the workforce with the skills required for the jobs of today ... is a strategic concern, especially in times of economic hardship.”⁵

As part of the public health agency accreditation process, the Public Health Accreditation Board (PHAB) Standards and Measures bring the need for workforce development into sharp focus by creating a standard (8.2) that instructs local health agencies to “ensure a competent workforce through the assessment of staff competencies, individual training and professional development.”⁶

Specific needs and barriers. Research finds that while 74% of state programs collect information on staff training needs, “only 1% of programs reported that they have the capacity to provide appropriate and accessible training in all areas.”⁷ The study also found that both graduate education for emerging professionals and continuing education (CE) for practicing public health professionals is lacking. In fact, “80% of public health workers have not received formal training in their specific job functions [at a time when] state public health agencies ... are being substantially downsized as a result of unparalleled state deficits ... and the dilemma of an aging workforce.”⁸ Additionally, only 17% of the public health workforce has a degree in public health at any level.⁹

Given the educational makeup of a busy public health workforce, research findings highlight the need for providing a broad framework of education and training that incorporates adult learning theory that “facilitates the learners’ engagement” and competencies that “facilitate adults’ engagement in the learning process.”¹⁰ Competency sets such as the Core Competencies for Public Health Professionals have been developed to facilitate acquisition of knowledge and skills that “reflect foundational skills desirable for [public health]



professionals.”¹¹ Research further indicates that “it is critical for the busy public health workforce to access training in settings other than full-time degree programs.”¹²

It is predicted that 38% of the current workforce will have left government public health by 2020 and that 18% intend to leave their positions within the next 12 months.¹³ Currently, 12% of state public health positions are vacant.¹⁴ Nationally, 91% of all state health agencies have reported job losses resulting from layoffs and attrition; only 28% of vacant positions are currently being considered for recruitment.¹⁵ State budgets are a constraint on training; 38% of all local health departments (43% serving rural areas) currently do not have a line item in their budget for workforce training.¹⁶

Looking deeper into the training needs of the public health workforce, there is a defined need for online training. While blended learning approaches and conferences with skill-building workshops have been identified as preferred modalities for graduate education and continuing education, respectively, many barriers prevent these modalities from being a “one-size-fits-all” solution. A lack of career opportunities, insufficient agency support, and inability to take leave for long-term education are barriers to pursuing graduate work. Similarly, travel restrictions, time away from work, costs, and geographic factors are recurring hurdles to pursuing CE opportunities. Together, these are the barriers for those professionals who *can actually attend* face-to-face meetings; a large number of public health workers are *unable to travel* to meetings or ongoing classes. The number of workers denied access to in-person trainings will only increase as budgeting becomes more challenging.¹⁷

To counterbalance barriers to in-person training, an “appreciable interest, capacity, and preference” has been identified for online learning at state and local levels. Three-fourths of agencies surveyed had the capacity to access web-based programs, and two-thirds reported having agency approval to use the web for CE during work hours.¹⁸ Training needs have also shifted over the years, with personal leadership skills rather than organizational skills indicated as a major emphasis for the public health workforce.¹⁹

Information technology (IT), with a focus on online learning, in the public health sector is “increasingly viewed as the most promising tool for improving overall quality, safety and efficiency of the health delivery system.”²⁰ However, there is a documented gap between federal investment in IT and professionals’ skills in using it to advance public health.²¹ In recognition of this fact, the redesigned U.S. Public Health Service’s goals include a recommendation to “improve IT skills among public health professionals and medical practitioners.”²²

While online learning offers a promising solution to the barriers of in-person training, it presents challenges as well. With the dramatic increase in information available on the Internet (including training opportunities), public health professionals currently face a new level of information overload. Methods of seeking and sharing information have changed dramatically over the past decade, but the public health community still faces the same problem of trying to access the right information at the right time. Learners must now sift through mountains of material to find what is useful. For example, a Google search for the keywords “leadership training” yields 6,920,000 resources; a search for “program evaluation” yields 5,500,000 hits.²³

Studies have found that a large percentage of the content expertise needed to train the public health workforce already exists. Reports indicate that what is needed is “to utilize technology to develop innovative collaborative learning experiences” to improve knowledge, skills, and promote a sense of community.²⁴

These data indicate that there is an “urgent need to equip the people currently working in state public health programs and those who will be entering public health ... with the knowledge and skills necessary” to promote public health programs.²⁵ The Trust for America’s Health summarizes the need succinctly: “As employers, the federal, state, and local



government health agencies should support and fund ongoing professional development training for public health workers. This will ensure that public health workers are prepared to handle the constantly changing public health needs in communities, skills are kept up-to-date, and opportunities are provided for career advancement.”²⁶

Addressing the need. The National Coordinating Center for Public Health Training (NCCPHT) at the National Network of Public Health Institutes was funded in 2014 by the Health Resources and Services Administration (HRSA) to work with ten Regional Public Health Training Centers (RPHTCs) and 40 Local Performance Sites (together known as the Public Health Learning Network – PHLN) to “improve the nation’s public health system by strengthening the technical, scientific, managerial, and leadership capabilities of the current and future public health workforce.”²⁷ A key activity to accomplish this goal is the “co-creating and modernizing a best-in-class public health training system that is easily accessible to all communities and Tribes.”²⁸ Together, with its partners, the PHLN aims to ensure that all public health learners have easy access to quality training that meets their needs.

The field of public health online learning is experiencing a period of great change and promise. New technologies allow for interactive, engaging access at a time when more people are online than ever before, agencies recognize the utility of distance-based learning, and shrinking budgets are forcing creative solutions to keeping knowledge, skills, and professional accreditations current. In order to inform future directions, NCCPHT partnered with the NCEMCH at Georgetown University to conduct a rapid yet comprehensive environmental scan to develop a complete picture of delivery and dissemination systems for public health training with an overarching goal of developing a strategy to use technology “to connect public health practitioners with training, tools, and resources to advance public health practice.”²⁹ This report describes those efforts by summarizing an environmental scan of 70 online public health learning systems, an online survey of 90 public health professionals, and 20 key informant interviews with leaders from the field (gathered from 15 separate interviews and written responses). The report highlights 50 findings that emerged from the study and presents a set of 12 recommendations.

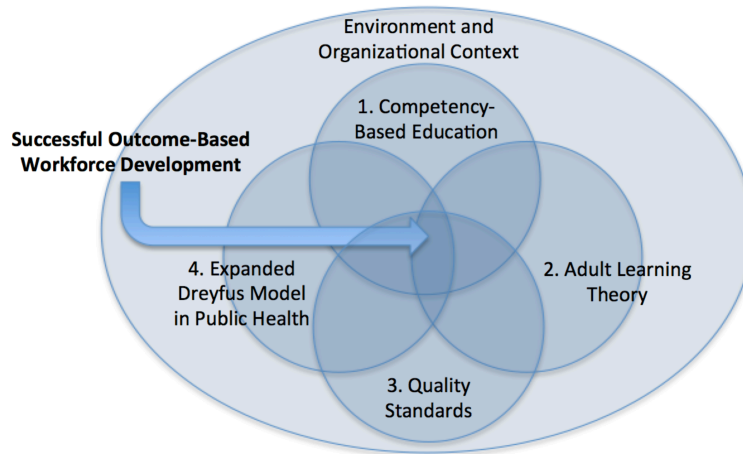
II. TOPOLOGY & TOPOGRAPHY OF ONLINE LEARNING SYSTEMS

Topology of how online learning systems fulfill a need. Before describing the landscape of online learning systems, it is important to look at the need they address and why they fulfill the training needs of the public health workforce. A quality-based adaptation of the Integrated Model for Outcome-Based Workforce Development (Figure 1) posits that successful outcome-based workforce development integrates (1) competency-based education, (2) adult learning theory, (3) an expanded Dreyfus model of the stages involved in the acquisition of public health skills, and (4) quality standards.³⁰ The most effective workforce development and education programs operate within the intersection of these constructs. “This framework provides a context for designing and developing high-quality, outcome-based workforce development efforts and for evaluating their impact.”³¹

Effective online learning systems are critical because the content and support they provide directly address learner needs within the overlap of these organizing principles, thus providing successful outcome-based workforce development that is guided, comprehensive, trusted, and curated based on defined standards.



Figure 1: Adapted Model: Quality Outcomes Based Education, Expanded Dreyfus Workforce Development Levels



1. Competency-based education. “Competencies target and make explicit the expected outcomes of the educational experience. They are the structural tools that facilitate adults’ engagement in the learning process.”³² In adult learning, they are used to develop, deliver, and evaluate learning activities; identify job responsibilities; and assess capacity at an individual and organizational level. Online learning systems that utilize established competencies and develop/collect learning opportunities based on needs assessments are effective in that they pre-select content that is competency- and need-based and provide a curated experience for the learner. Learning systems serve as a matrix for connecting learners to learning opportunities that address competencies and needs, providing the tools to strengthen gaps in knowledge and skills.

2. Adult learning theory. “Designing public health educational programs that consider adult professionals’ learning needs is critical.”³³ Learning that is active, reflective, and interactive; shows immediate relevancy; mirrors the complexities of the workforce; and engages previous experiences of learners are all traits of successful adult learning. Online learning systems employ short, directed trainings tied to interdisciplinary competencies that public health professionals need to effectively carry out their work.

3. Quality standards. Busy professionals report that a barrier to learning is not having time to weed out learning materials that are irrelevant, outdated, or of poor quality. Online learning systems have the potential to make a contribution in curating high quality trainings in light of the explosion of resources available on the Internet, many of which are of lower quality.

4. Expanded Dreyfus model of skills acquisition. The Dreyfus model (adapted for public health) helps to define stages of learning and provides a clear path to advance from one stage to the next. The “proliferation of competencies in public health creates challenges for the educator attempting to select appropriate competencies to target training.”³⁴ The Dreyfus model “divides skills acquisition into stages [and] facilitates the identification of longer-term outcomes...by providing a larger context to consider when selecting the level of sophistication of a target competency.”³⁵ Online learning systems directly support this model by providing a curated body of courses and resources for the learner, so that they can select trainings that are appropriate to their needs, knowledge, and skill level.

Defining terminology. As with any professional field, online learning and workforce development use language that has specific, sometimes highly nuanced meanings. Throughout this report, terms such as trainings, learning opportunities, competencies, and LMSs are used as clearly as possible with meanings that align with generally-accepted use. It should be noted



that when the report discusses the RPHTCs, it is referring to the 10 HRSA-funded training centers.

Surveying the systems. The 70 online training systems reviewed range from simple to complex, budget-friendly to extremely well-funded. In general, there appear to be a hierarchy of sites, which consisted of:

- Repositories
- Public health/health care/education training systems
- Continuing Medical Education (CME) providers
- Commercial/high-end training sites, often Massive Open Online Course (MOOCs)

The repositories most often include courses (and in many cases, webinars) that were developed by the hosting organization, are not housed within an LMS, and do not contain advanced searching or reporting features. Among public health learning systems, there is surprising consistency in features that are offered, including advanced organization by topic, announcement of new content via electronic newsletters, and links/integration with external LMSs. The overall quality of online public health learning systems is high even when compared to higher-end commercial sites. With a proliferation of public health sites, though, it quickly becomes difficult to keep them distinguished, and easy access to specific online courses becomes difficult. CME provider sites are quite distinguishable, following a pay-for-play model. Of note, several high-end commercial sites (e.g., Lynda, EdX) provide visually engaging layouts that could be used as promising practices for future development or upgrades to public health sites.

Topographical markers of the field and systems. The findings and recommendations of this report provide a detailed roadmap that leads to a modernized public health training system. Sections of this report serve as landmarks in the workforce development landscape and indicate those areas that are important to the field. From the findings we know that technical access, perceived quality, and defined procedures are critical to online learning systems. We also know that many online learners desire continuing education credits and are eager to access online training when access is easy and their path is guided through trusted sources. This report delineates critical features that are present in the most effective sites and also explores the technical, quality, and organizational barriers that online learners face. Promising practices are identified that will help overcome barriers, collect data, and allow for collaboration to improve methods for providing workforce development. Report recommendations serve as the final guide to topography by identifying specific activities needed to advance online training standards, coordination among partners, and the larger systems that serve as the infrastructure in this landscape.



III. METHODOLOGY

Introduction. A descriptive research methodology was used to conduct an inventory of online training delivery systems. Data was collected using a 3-pronged approach utilizing quantitative and qualitative research methods and comprised an: (1) environmental scan of online learning systems; (2) online survey of public health professionals; and (3) key informant interviews. The project timeframe consisted of a 12-week period with weekly milestones.

Environmental scan. The environmental scan consisted of the creation and population of an online database of training delivery systems. In weeks 1 and 2 of the project, search strategies were developed, database structures were determined, and the identification of training delivery systems was completed. Over 120 systems were initially reviewed; more than 50 of these systems were excluded due to duplication or too narrow scope. During weeks 3 through 5, staff reviewed the 70 remaining training delivery systems and recorded over 30 variables of data per review.

Online learner survey. The online learner survey was developed during week 2 of the project and distributed during week 5 to a purposive sample of public health professionals nationwide. The sample targeted various types of public health settings to gain the broadest range of online learners' experiences with LMSs. The instrument consisted of 20 questions across 5 domains and was developed and distributed through the Survey Monkey platform. Ninety responses were collected and included in the data analysis.

Key informant interviews. Information from 20 high-level professionals involved in the development of online learning systems was collected through 15 semi-structured interviews and 1 set of written feedback. An initial roster of individuals to recruit for the interviews was developed in week 1 and a questionnaire with corresponding PowerPoint slides that provided a visual guide to questions were completed during weeks 2 through 3 of the project. The slides were used during the interviews to provide structure for the conversations. These in-depth phone/video interviews were conducted during weeks 3 through 5 using the ZOOM platform to support the collection of qualitative data. Interviews were recorded so key data could be extracted.

A process of documenting thematic saturation from the data collected was employed. Common themes emerged from each collection method. Each source of information reinforced the others and iteratively refined the study process. As information was uncovered, research methodologies were adjusted. For example, discussion with a key informant often led to the identification of new contacts to interview or a new system to add to the inventory. As information emerged, the environmental scan database was refined, new questions were added to the interviews, and the survey tool was distributed to new audiences. This organic, relationship-based approach capitalized on the collective expertise and shared perspectives of multiple stakeholders.

During weeks 6 and 7, data from the scan, survey, and interviews were analyzed and compiled into a set of 50 findings, organized by themes that define the field and presented in Section IV. These findings were then organized into mutually reinforcing groups during weeks 8 and 9. These groups of findings formed the evidence base for a set of 12 recommendations, outlined in Section V.



IV. FINDINGS

Findings are presented separately for each data collection method: environmental scan, online survey, and key informant interviews. Overlap of findings between sections, while repetitive, shows consensus among what is observed in the training systems (environmental scan), what is expressed by the public health workforce (online survey), and what is indicated by the developers of systems that provide training (key informant interviews).

A. ENVIRONMENTAL SCAN

Summary. Overall, 44 of the 70 systems analyzed were public health oriented: 16 focused on health care; 12 were general educational portals; and 10 were commercial (non-mutually exclusive categories). Funding for these sites varied: 27 were government funded; 5 were supported by foundations; 14 were commercial; and 7 were academic/attached to universities. Because this work was conducted to inform the PHLN, the 10 RPHTCs who are part of the PHLN were included in this scan, and findings related specifically to RPHTCs are highlighted in each section.

The format for these systems fell into 7 non-mutually exclusive categories, representing a full range of sites from simple to complex: 40 were basic websites that served as static collections/warehouses for trainings; 6 focused on mobile access to trainings; 13 heavily relied on social media; 28 sites were considered “advanced” and included an LMS to organize trainings; 4 utilized a self-assessment (only the MCH Navigator integrated that self-assessment into trainings through a personalized learning plan); 7 utilized MOOC formats; and 9 were video-based learning platforms. See charts below for summaries.

Chart 1: Sites by Type/Industry

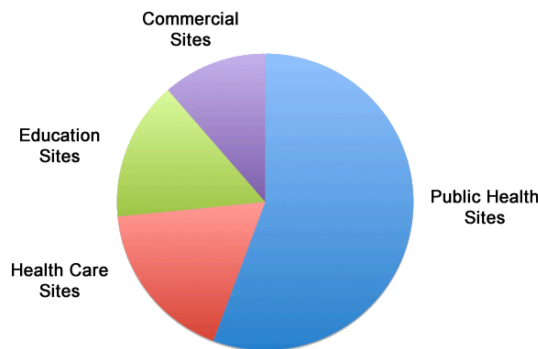


Chart 2: Sites by Funding Stream

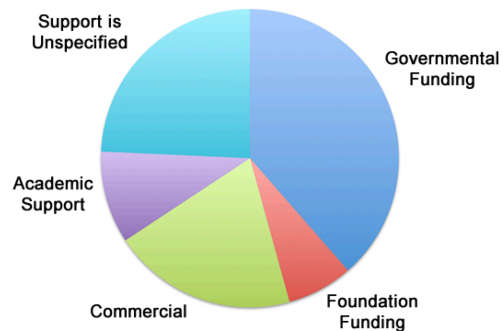
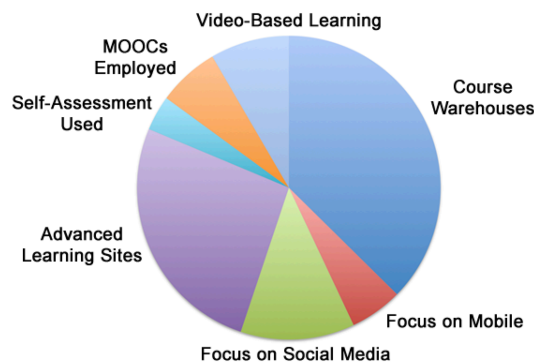


Chart 3: Sites by Modality





1. Findings Related to Technical, Quality, and Procedural Information

1.1 The most engaging sites contained advanced features such as an identifiable LMS, integration with other sites, and social media. Forty of the sites analyzed were clearinghouses of trainings, often unsorted other than by date or alphabetically. They generally only provided access to courses that the parent organization had developed and housed on the site itself. While the content in these sites often appeared to be of high quality, there were few supports to help users access trainings easily. Conversely, the 30 sites that included advanced features and graphical interfaces were clearly more engaging and provided a richer user experience by inviting users to dig deeper to find learning opportunities that were not immediately visible. The 33 sites with an LMS provided users the ability to search for trainings, record which trainings they had taken, and often allowed for course/site feedback. Ten of the sites had clear interfaces with other training systems (most often TRAIN.org or local sites within a RPHTC), providing access to additional trainings through their system; these sites were noticeably enriched by this additional content. Specific features of note will be discussed in Section 3.

1.2 There were popular categories of learning opportunities presented by the systems: archived webinars, recorded audio/video presentations with slides, and video trainings were the most abundant. Archived webinars were present in nearly every system other than high-end commercial and CME-awarding sites. Almost equally as prevalent were pre-recorded audio/video presentations that often included PowerPoint slides; many of these had been uploaded to video hosting sites (e.g., YouTube, Vimeo) to allow for easy access. Among commercial sites, the preferred mode of presentation was staged and scripted video presentations; quality of these videos was exceptionally high, but often required additional software to be downloaded from the site.

1.3 Most sites required registration and login of some form. Fifty-eight sites out of 70 required at least a basic registration. Twenty sites required registration for access to the entire site; 29 for an individual course; and 9 for special features. Twelve sites did not require registration/login, and these sites were mostly webinar repositories. As a group, there was no uniform registration for the RPHTCs. Registration for the various TRAIN sites is universal; however, sometimes external registrations are also required for courses listed in TRAIN. Registrations for learning systems varied from basic user information to up to 20 identification and demographic questions and passwords.

1.4 Few sites had detailed technical and logistic information, including information on accessibility. Only 13 out of 70 systems listed explicit technical requirements to access courses; 6 sites presented courses in SCORM format as a technical option. Nine sites were explicit that their system integrated with an external LMS. Ten sites were accessible for users with different abilities. Closed captions and material in non-English languages were the most common accessibility features. Only one site specifically addressed meeting requirements of Section 508 of the Americans with Disabilities Act (MCH Navigator). Three of the RPHTCs listed explicit technical requirements (the Region 2 RPHTC, Region III Mid-Atlantic RPHTC, and Region X Northwest RPHTC) and two clearly explained or linked to their accessibility standards and/or tools (Region 2 RPHTC and Region VII Midwest RPHTC).

1.5 Few sites explained quality and currency standards, while most sites indicated that quality and timeliness of learning materials were important. Only 14 sites listed quality standards for the materials contained on their sites, whether developed by the site authors or linked to from other sites. Only 8 sites provided inclusion criteria and explained a process of sunseting or retiring trainings. Most of these sites focused on quality and retention of materials in fulfillment of CME requirements. In most instances, it was difficult to determine when training materials were developed and if there was a review process whereby old materials were removed from the site. Seven sites included user rating systems, giving users the ability to rate each course and see what other people have said about the course. This feature was only included in



TRAIN and high-end commercial sites. Four of the RPHTCs listed their quality standards (The Region 2 RPHTC, Region IV RPHTC, Region 6 South Central RPHTC, and Region VIII Rocky Mountain RPHTC) none explained their inclusion criteria or sunseting procedures.

2. Findings Related to Content Description/Organization and Continuing Education

2.1 An equal number of sites provided access to their own content, content linked to from other sites, and a combination of materials developed in-house and elsewhere. Sites were diverse in the learning opportunities they presented. Of the sites that developed their own materials, 28 provided access to materials that they developed exclusively; 41 provided access to content that they developed as well as to other trainings from partners or the field in general; 17 sites did not develop their own content but linked exclusively to materials developed by partners or others; and 11 sites focused on “best-of” materials from the field. Providing multiple access points to trainings was consistently stressed by systems, regardless of who originally developed the content. This was particularly evident with the RPHTCs, all of which provided access to trainings developed by others including local partner training centers.

2.2 Well-developed sites typically included annotations of trainings, and to a lesser degree, learning objectives. Forty-five of the systems consistently included annotations, following several standards: text taken from the trainings themselves; 2-3 summary sentences written by the system developers; or 1-2 paragraph descriptions that include overviews, key topics, speaker biographies, target audience(s), and additional resources written by the course developers. Several commercial sites and MOOCs used short videos innovatively to provide introductions to courses (e.g., EdX). Two of the RPHTCs included annotations consistently (Region 2 RPHTC and Region 6 South Central RPHTC). Just 25 of the 70 systems consistently included learning objectives with their trainings; often these are taken directly from the trainings or accompanying resources (usually PowerPoint presentations). Half of the RPHTCs routinely included learning objectives.

2.3 Despite much emphasis found on sites related to competency-based learning and adult learning principles, few systems routinely track trainings to these ideals. Fewer than 20% (17/70) of sites linked trainings directly to specific competencies. TRAIN utilizes the Core Competencies for Public Health Professionals as well as other competency sets; course developers can use the competencies when creating the course description, and trainings that are tagged with competencies can be searched for by user.

Notably, 3 of the RPHTCs explained that they utilize the Core Competencies in developing/ highlighting courses (Region 2 RPHTC, Region III Mid-Atlantic RPHTC, and Region V Great Lake RPHTC). While it was assumed that many, if not most, of the systems analyzed employed some form of adult learning principles in the development of their courses (based on consistency among courses, use of learning objectives, and expertise of speakers), only 9 systems directly explained the principles that were employed.

2.4 Continuing education was offered to a lesser extent than would have been expected.

Thirty-six systems offered some type of continuing education units, credits, or certifications, including CE, CEU, CME, CNE, and certificates. The type of continuing education varied widely, although it should be noted that 7 systems reviewed focused primarily on providing CMEs to healthcare providers; 9 systems consistently required payment for continuing education, while a number of other sites linked to individual courses that may require payment; 12 sites provided credit themselves while 15 relied on a third party to provide credit. Of the systems where access did not require immediate payment, it could be observed that 13 systems used pre- and/or post-tests to track learning. Many of the RPHTCs offered continuing education on a broad scale (Region I New England RPHTC, Region 2 RPHTC, Region IV RPHTC, Region V Great Lakes RPHTC, Region 6 South Central RPHTC, Region VII Midwest RPHTC, and Region IX Western Region RPHTC); it is possible that additional centers offer continuing education for



specific courses. By and large, it appeared that most utilize third-party organizations to provide credit.

3. Findings Related to Critical Site Features

3.1 Advanced organizational systems were critical for effective training systems. To aid learners in finding relevant, timely courses, 40 systems organized courses by popularity and/or broad themes: 34 provided detailed topic areas, audience, or geographical significance under which to organize courses and 21 included “what’s new” sections on their site to highlight new trainings and emerging issues. Many systems employed two or more of these strategies. These organizational features provided an easy passage for the learner to browse and access courses that they might otherwise have passed over in a simple list or by keyword searching. Most of the organizational systems were graphically pleasing, combining images with trainings, speaker photographs, and icons to assist in navigating through the site and choosing a course to access. Nearly all of the RPHTCs provided access to a combination of popular courses/topical organization schemes; about half provided access to new courses on home pages.

3.2 Many learning systems have active newsletters and social media presences to disseminate training information. Thirty-one systems prominently market online newsletters, with varied frequencies (weekly, monthly, quarterly, as materials are developed) to keep learners informed of project updates and new/upcoming learning opportunities. Thirty-three systems employ some form of social media, with the most popular being Facebook and Twitter, as current awareness mechanisms. Many sites also include social media sharing on their sites where learners can “like” a page/training and share it via a variety of social media platforms. The majority of RPHTCs utilize electronic newsletters, while 3 have strong social media presences (Region 2 RPHTC, Region VII Rocky Mountain RPHTC, and Region X Northwest RPHTC).

3.3 Most systems did not include instructions on how to use their website. Only 14 systems included information on “how to use” the site, instead relying on learners to use their own search skills to locate information. While many features were common on sites (e.g., search boxes, highlighted courses), not having instructions consistently slowed down the process of finding trainings. The MCH Navigator contained detailed instructions on how to use the site in different scenarios (e.g., looking for self-directed learning, semi-structured learning bundles, directed) and gave examples of how others (including state systems) could use the site. Of the RPHTCs, the Region 2 RPHTC and the Region X Northwest RPHTC provided detailed instructions on how to navigate the site.

3.4 Course rating systems were identified as a “high-end” feature on several learning systems. While not widely prevalent (9 systems had the ability for learners to rate courses; 7 systems displayed course ratings from users), the ability for users to rate and comment on individual courses gave sites the ability to solicit feedback on content, quality, and effectiveness of online trainings. Users appeared to embrace and utilize this feature as evidenced by numerous visible comments left by learners who had previously taken courses. The wide use of this functionality in commercial practice (e.g., Amazon’s “rate this product”) has made it a feature with which online users are familiar.

3.5 The ability to search for trainings was prevalent in more advanced systems. Twenty-eight systems included the ability to perform a basic search on its course offerings; these systems were typically more than basic training repositories. About half of that number included an advanced search of some kind. Five of the RPHTCs included a prominent search feature.

3.6 Information on training modality also was observed in robust systems. Twenty-one sites listed the teaching modality (e.g., archived webinar, self-paced course, video) as part of a larger description of the course. Twelve of these sites allowed learners to search by modality. The RPHTCs routinely included this information in their course descriptions.



3.7 Supplemental resources were included in some systems, but not consistently across the spectrum. Nineteen sites included resources to support online trainings; these resources ranged from PowerPoint slides to interactive worksheets to help turn learning into actionable plans. It was apparent that some trainings included additional resources (often described as links for more information at the end of the presentation or webinar). The inclusion of resources outside of the course itself usually occurred when there was a more detailed description of the course and for more advanced courses. The Region III Mid-Atlantic RPHTC and the Region X Northwest RPHTC often included resources with their trainings.

3.8 The ability for learners to ask questions and/or receive TA was present in many learning systems, but often was not prominently featured. Fourteen sites offered TA of varying degrees, most typically through email support; five sites specifically had question-and-answer sections to assist learners with their most commonly asked questions. These features were not widely visible across the learning systems.

3.9 Learner self-assessments and other tools to assist users in identifying their learning needs were surprisingly lacking across systems. Only 5 systems included self-assessments to help learners identify areas of needed growth (the TRAIN system was the largest notable exception, with its inclusion of a self-assessment on the Core Competencies for Public Health Professionals). While there appears to be a need in the field, the MCH Navigator was unique in having developed a fully automated online self-assessment that scored learners' responses and matched them with appropriate, competency-based trainings. This system further included questions to track increases in learners' knowledge and skills over time.

3.10 Online communities of learners were sparse, despite feedback from the field that communal learning was important. Five systems integrated some form of collaborative learning that involved interaction of learners who were or had taken a course (mostly through shared comments, questions, and experiences). Of these, 2 were firmly public health oriented: PHII Information Academy and the MCH Navigator (which included a fully developed Learning Collaborative). The other 3 examples came from advanced educational/commercial sites: EdX, FutureLearn, and the Institute for Healthcare Improvement Open School.

B. Online Learner Survey

Summary. The Online Learner Survey presented 20 questions in 5 domains that allowed respondents to focus on a mix of quantitative and qualitative topics. Ninety participants filled out the survey. The following findings relate to user demographics, perceptions, level of access, best practices, and other constructs related to online learning systems.

1. Findings Related to Quantitative Data

1.1 Respondents showed an appreciable interest in online learning, knew where to find trainings, and preferred a variety of training modalities.

- The majority of respondents (77%) access trainings from a link/announcement on a website that directed them to an external online training system.
- Nearly all of respondents reported the quality of trainings online were either 'good' (46%), 'very good' (34%) or 'excellent' (3%).
- Weighted averages showed respondents having near equal preferences for training modalities offered; however, the highest frequency of 'strongly like' was equally selected for webinar archive and interactive courses, while the highest frequency of 'like' was equally selected for online narrated slide presentations and online courses.



- TRAIN (main site) and CDC Public Health Grand Rounds were the most common online training system used (43%), followed closely by CDC Learning Connection, TRAIN (state site), CDC Training and CE Online, and the MCH Navigator.
- The majority of respondents indicated ‘free trainings’ were most important in an online training system, followed by ‘access to trainings by topic’, and ‘evidence-based learning.’

1.2 The demographics of the survey sample aligned with what is known about the public health workforce.

- The majority of respondents were Caucasian (74%) and female (83%), between the ages 55-64 (31%) who have worked in the field for over ten years (47%).
- Over half of the sample (60%) indicated employment in state health/public health department and most frequently selected disciplines include health service manager/administrator (24%), nurse (16%), and academic staff/faculty (11%).
- A total of 33 states were represented by the sample. Of note, Kentucky was the most frequently selected state of employment (16%), followed by California (9%).

2. Findings Related to Qualitative Data

2.1 General Findings

2.1.1 Many users are satisfied with the quality of online training from trusted sources and usually rely on external guidance to find quality learning opportunities. A high percentage of respondents report an overall good experience with online training—“no problems; most courses have been fine.” Overall satisfaction was conveyed, with an appreciation for blended methodologies.

- *Access and availability to online trainings that I can take according to my schedule! Also, no travel costs, minimum “down time” from the office and clinic.*
- *Honestly, I prefer in-person training. But if you can't do that, it would be having dynamic presenters who can do a really good job of presenting information.*
- *Effective training should include a mix of in-person/face-to-face and online. We are doing way too much with online and not enough in-person. It is costly, but it works. Why can't we do more train-the-trainer models so we can disseminate training locally in person?*

As long as you're talking about online training provided through a public health system, I find training very good. If you're talking about “online” training using a search engine, I find training poor.

Those who are most satisfied often have a “curated” online training experience—either self-created or externally directed. Thirty-eight data points refer to relying on “reputable sources” for online learning as essential. Respondents often identified one or a few high-quality sources that they go to and/or that send them timely alerts about available training. For externally-guided learners, an external source — their state health department or supervisor/mentor/professor, specific job requirements, or professional credentialing board —has structured their training experiences and directed them to appropriate or required online choices. Respondents reported high comfort and satisfaction levels if a training is recommended by a colleague (2 data points); announcements or reviews came from a reputable source (11 data points); or required by employer (3 data points).

2.1.2 Learners presented clear convictions of components that comprise quality online trainings. Once learners have taken a training, they indicated that they evaluate quality on a variety of criteria, including its relevance and applicability to their work, use of evidence, and clarity of presentation. Characteristics of valued learning experiences consisted of the following:



- Updated, timely content, appropriately applied technology, versed and vetted presenters, resources and additional support documentation.
- User friendly; platform easy to access; CEU available.
- Presents the material in a relatable context. Cites the empirical research foundation of the content. Aligns with applicable standards or goals. Provides examples of the concepts applied in practice. Is actionable. Provides an opportunity to practice new skills. Provides an opportunity to reflect. Assesses acquisition of knowledge and skills. Provides follow-up activities that require demonstrated application of learning. Provides opportunities for continued learning.
- When the course objectives are being met through both expert level sharing and interactive means; when I am learning something and want to pass it on to others; when presenters are credible and accurate and resourceful and have learning materials that complement the web presentation. If I want to pass on the recording or materials, I know it was quality.

2.1.3 Learners indicated that they are most comfortable with taking trainings when the description of content provides credible, relevant information.

Specific examples include information provided on learning objectives, an agenda, and pre-training materials (6 data points); currency (2 data points); relevance of topic to learning needs (2 data points); if it's competency-based (1 data point); if references are provided (2 data points); instructional design (2 data points); visual aspect of the training and whether it's more polished or "clunky" (1 data point). Conversely, many respondents indicated that they had no way of gauging quality until they actually take a course and considered this a weakness of many online training systems (13 data points).

I appreciate trainings that have a course outline up front. I need to know if the training has the exact content I'm looking for before I spend time registering.

2.2 Findings Related to Issues/Barriers

2.2.1 The most consistent issue reported when users had to search for their own trainings was a "clutter" of too many courses, often with duplication of topics across multiple systems and no easy way to determine quality. Numerous respondents stated that finding the same type of course in multiple locations is confusing and inefficient. The sheer number of locations to look for trainings was often intimidating. These feelings were echoed by many respondents.

- WAY TOO MANY CHOICES! I find the state and national TRAIN system intimidating.
- Too many different platforms that are not interconnected.
- It's so hard knowing that the course I found is actually good. I tend to stop searching after I find a course on the topic I'm looking for, but I always wonder if there is something else out there that is better?
- I need to be able to easily find trainings on the topics I need. My needs are specific and there are too many trainings ... to have to scroll through every possible option.

2.2.2 Incomplete information on individual trainings was cited as an ongoing issue. Many respondents noted that when they identify a training that might be appropriate, they are unable to determine if it's a good match for their needs because information provided upfront is incomplete. Respondents indicated that it would be helpful to have each of the following pieces of information when considering a training option:

- Learning objectives: "Those without defined learning objectives are difficult to screen for applicability to one's own work."
- Is it competency-based?
- Is it evidence-based?



- Level of training (101 or beyond?).
- Length.
- Technical requirements to take training.
- Are continuing education credits offered?
- Cost.
- Currency: date developed and whether it is the latest version of the course.
- When is the training available? If it's a webinar, will it be archived? Will the learner be able to bookmark it and return to it?
- Contact information.

2.2.3 There was considerable frustration expressed with registrations, especially multiple registrations and difficult, time-consuming processes. Chief among barriers, respondents stated that registrations were too complex or required too many clicks to get to courses.

- Hard to access the platform and then the materials — the initial experiences to [register and] link into it were awful! — haven't (sic) tried since!
- Registration too complex; too many clicks; navigation of site not user-friendly (21 responses with the following examples):
 - Registration with user names and passwords that need to be memorized or dated; need to update user profiles on a regular basis.
 - Too many logins required on too many different LMS.
 - TRAIN registration is too complex and the system navigation does not make sense. There are far too many steps involved.
- Some systems are way too difficult to get into. I have a list of 15 different usernames and passwords I have had to set up as I am checking out different systems, and some of those systems still take me multiple layers to get into the system. In those same systems I often have staff (especially our less computer literate staff) tell me that they can't get through the system, and I have to get them in myself. By that point I would rather have just given a training myself.
- Don't want to have to log in/create an account just to see training details to decide if I want to take a course.

I dislike the registration processes. I usually go back and find something else to take.

2.2.4 There was still considerable difficulty with technology issues and security barriers to access online trainings. Reported technological issues resulting in difficulty accessing trainings are well documented in the literature and were reinforced by respondents; a summary follows.

- The biggest problem I have with online trainings is compatibility between my computer network and the software interface. In our county, security takes precedence over usability, so I often either can't access a training or have to work with (Reluctant) IT staff to do so.
- Many online trainings still fall to the lowest common denominator of recordings from webinars where audiovisual quality is poor or sponsors don't bother to edit out technical issues or interruptions from the live session.

I am sometimes not able to access training videos, podcasts, blog posts, etc. because of restrictions to employee access.

2.2.5 Users expressed that site organization and search features needed to be improved and that site maintenance was still an important issue. The ability to search for specific courses was observed in only 28 of the 70 systems reviewed, yet this feature was consistently brought up as important and underdeveloped across sites. [What is needed is] a comprehensive search tool for systems with many opportunities.



- *I would love to have a comparison grid with trainings listed and qualities marked—a “consumer reports” format where you can quickly identify which of the trainings are synchronous/asynchronous, cost, length, modality, and if there were ratings, even better.*
- *Keep trainings current; sunset out-of-date courses (Drop trainings from repositories that have not been evaluated and revised within a certain time period (2-5 years). Prompt submitters when end of the time period is approaching).*

2.2.6 Other issues were identified as barriers to online learning. Respondents were vocal in sharing their opinions that fit into distinct themes, as illustrated below.

- *Too much overview information. Too many introductory courses.*
- *Recorded trainings over 60-90 minutes; Some much too long; Modules are too long.*
- *Dislike that some webinars have participant limits. Really annoying if you can't get in because you log-in 5 minutes after start time.*
- *Being interrupted by staff and/or supervisor; difficult to complete during work hours along with other job duties.*

2.3 Findings Related to Promising Practices

2.3.1 The desire for a “one-stop shop” to provide access to high quality public health training emerged. Over 20 respondents stated a need for a “universal system” to aggregate and access materials.

- *If there was a one-stop shop for Public Health related trainings where you could narrow your search based on your profession, the topic of interest, etc., that would be ideal.*
- *Centralize all trainings and provide an index of classes by level and length.*
- *It's always helpful if a trusted organization communicates about trainings to members or posts training links on their site; Set standards for quality.*
- *Having one site to go to which provides access to all trainings listed on that site. In other words, no additional registrations.*
- *For me the TRAIN system tries to be all things to all people. I prefer to use a trusted single source such as NACCHO or the Public Health Foundation where I know I will find topics of interest to me. I can scan a reasonable sized archive to find topics and trainings of interest. Most of the presenters are public health practitioners rather than only individuals from academia.*
- *Centralized trainings on demand; Online Integrated Learning Public Health training system for the state and local level; One-stop shopping; Ability to list/identify trainings on a central location (an App maybe).*
- *There are a lot of listservs to keep track of. One main list would be best.*

2.3.2 Respondents wanted to have a sense of the quality of the training before pursuing it further. Individual responses indicated that online learners look for readily identifiable marks of quality, including:

- Vetting based on accepted quality standards.
- Professional/expert reviews.
- User reviews or ratings.
- Data on effectiveness; increase in learning.

Individual responses included:

- *Standards for quality and objective vetting, paired with a vetter's score of quality, would be more helpful than the average rating of subjective individuals; unless there is the*



opportunity to comment specifically on why the individual did or did not like their experience.

- *Implement user feedback. Course rating system like Amazon—let the people decide what is good quality.*
- *Ratings of trainings would be helpful but I want to know who rated it so I can determine if they are credible!*

A common frustration was not having the ability to quickly access a sample of the training to see if it met a learner’s needs. Instead, complicated logins often prevented a quick preview. It should be noted that the Region 2 Public Health Training Center offers such [samples](#).

2.3.3 Learners expressed a definite need for more continuing education opportunities.

Respondents indicated that they experienced a lack of available continuing education credits online and that this was an important priority in choosing online courses. There was specific mention of the need for multiple forms of continuing education, including CME, CNE, CHES, and CPH.

- *Stunningly shocking is that many of the PH trainings offer NO CEU's for clinicians, who are the heart and soul of community health care practice.*
- *Continuing education offerings; I like to get a printable certificate of completion upon finishing a training. With PHAB accreditation, it becomes increasingly important to be able to document continuing education efforts.*
- *Offering of continuing education credits is valuable for public health RN's to meet state license requirements.*

2.3.4 Respondents provided many pieces of specific advice, best summarized as wish lists.

These data points, outlined below, are wish lists of items that users would like to see regarding: (a) the work/learning environment, (b) learning systems, and (c) course developers. Items in these wish lists were expressed multiple times; duplicate responses were removed for brevity.

Wish List for the Work/Learning Environment; Advice for Supervisors
<ul style="list-style-type: none"> • <i>Create “protected” time for e-learning; value it. Minimize distractions.</i> • <i>Remove access barriers due to technology/security.</i> • <i>Increase awareness of quality training opportunities (listserv; staff development program; needs assessment).</i> • <i>Focus on sustaining the skills learned.</i> • <i>Develop mentors.</i> • <i>Share resources.</i> • <i>Develop a work plan for workforce development.</i>
Wish-List for Learning Systems
<ul style="list-style-type: none"> • <i>Provide comprehensive descriptions/annotations of trainings.</i> • <i>Make getting to trainings as easy as possible; one unified login.</i> • <i>Do not require advanced registration to access archived content.</i> • <i>Allow user to register on site and access any training without additional registrations.</i> • <i>Free/low cost continuing education, Reports CE to CE Broker.</i> • <i>Guide learners to appropriate online training experiences (match learner needs with training opportunities/screen and vet for appropriateness/quality).</i> • <i>Include the ability to stop and reenter course or webinar; rewind and review.</i> • <i>Send out calendar invites and reminders. An email newsletter reminding me of what’s coming up or to check the website regularly.</i> • <i>Critical to have materials that can be downloadable and used as reference.</i> • <i>Vetted offerings; using standards of quality; solicit expert review; peer rating and reviews.</i> • <i>Ability to link courses to my development plan I work to create with my management.</i> • <i>Ability to ask questions to receive TA.</i>



- Provide an archive of live webinars & edit out problems. Don't just put entire archive up.
- Use of widely accepted learning platforms such as Adobe Connect; ensure all systems have a way to download the delivery and are accessible to users.
- Ways to track increases in knowledge.
- Pre-/post-tests that demonstrate level of understanding and knowledge gained followed by a certificate to celebrate completion.

Wish List for Course Developers

- Use best practices in adult learning and various modalities to teach the content that would appeal to various learning styles.
- For "real time" events, don't have a limit on number of registrants.
- Monitor webinars to minimize technical problems (e.g., muting; background noise).
- Limit length (under 60 minutes). Training available in short segments so that one section can be completed easily.
- Make sure that good visuals and enduring materials (resources) are available.
- Provide technical support for login or other technical hurdles.
- Can access on mobile devices; iPad/off-site accessibility.
- Trainings that are current and relevant (many are behind the need) and are geared to the enmeshed professional needing up to date knowledge (not just basics).
- Provide more opportunity for some type of interaction/follow-up. Increase use of case studies, or real examples and how they were applied. Provide more with a focus on how instead of what.
- Courses for supervisors.

C. Key Informant Interviews

1. Findings Related to the Landscape of Public Health Training

1.1 The development of a best-in-class online public health training system requires collaboration and investment from major stakeholders. Key informants expressed pride in what they are doing and an eagerness to share their work for the greater good. As one key informant said: "We're all committed to improve the competencies in public health. Leave money off the table. Start with what training do we need to provide to create the best workforce?" Others echoed the spirit and importance of working toward common goals: "We have a responsibility to direct people to the trainings that are good."

1.2 Public health online training is "under construction." Although there was no shying away from identifying gaps and barriers, there was also excitement about major initiatives underway to address these challenges. The dynamism of the field—with the changing needs of the public health workforce and rapidly evolving technologies—was seen as energizing rather than daunting. A sense of optimism and mission pervaded the interviews.

There was also a sense of a new paradigm taking hold about public health education. As one key informant expressed: "Agency-wide training and movement towards a culture of learning are all new concepts in public health. We are starting slow and as long as we continue this movement forward, we'll be able to make a difference in the long run. But we need the leadership support to do it!"

2. Findings Related to Current Challenges

2.1 The quality of online training is a major issue, and the effort to define and apply quality standards is critical. Key informants expressed the need to apply quality learning standards to course development, as well as ways to assess quality for the end-users. The de Beaumont Foundation's development of Quality E-Learning Standards for the public health workforce was seen as an important first step.



There was a general sense that, as one respondent noted: “We’re behind the times in look, organization, capability;” and that “We need a road map to where courses exist and to high-quality training.” Quality was defined in terms of “3-buckets,” where e-learning standards, content, and relevance come together.” As one key informant observed: “Courses must be engaging. We can use [quality] standards for e-learning developed by de Beaumont, but we also need criteria for content [and relevancy].”

Another pointed out that “You need to integrate the instructional design and content to make a quality training course. We have designed our center that way. A video and audio over the Internet (voiced-over PowerPoint or video clip of someone speaking) doesn’t qualify as a course/training.”

Other efforts were mentioned by key informants to address quality, including:

- *The RPHTCs are going through trainings related to their content areas to create a “best of” resources.*
- *We run a program here to teach state department of health staff how to develop good training. We help people design training for adaptability.*
- *We don’t make assumptions about quality. By use and people talking about it, it drives quality. Our system has the TripAdvisor function, but people aren’t using it to the extent that I’d like them to.*

2.2 Clutter—the overwhelming volume of online courses without a clear pathway to finding the best (most relevant, up-to-date, accurate) content—is a critical barrier. One respondent noted, “There are so many courses and it is very difficult to identify courses for quality, accuracy, currency, and relevance.” With respect to currency, sunset features were cited as important. Key informants also commented on the sheer number of systems. One noted that having so many systems makes it hard for the learner. They forget where they’ve learned something and can’t track learning.

2.3 Duplication of effort is pervasive. Several key informants pointed out that funding requirements often make duplication of courses difficult to avoid. As one respondent explained: “Before we were rolled up into a regional training center model, if [another state] had a training model on Public Health 101 it didn’t matter—I needed to do one for [my state]; I needed to keep it separate to justify it. It was a territorial situation because everyone wanted to count their trainings.” Another felt that duplication isn’t bad, and, in any event, can’t be controlled. However, she noted that, “As the money gets tighter, it drives collaboration and shared resources and new models.” Many key informants expressed strong support for coordination to avoid duplication, noting that some states aren’t familiar with the RPHTCs and how to engage with them. A key comment summarizes the need for coordination:

Coordination between state and local health departments is key. Also it confuses me that several states have their own LMSs and all are building courses on the same topic; such a missed opportunity! There should be core content with an opportunity to make it state specific or city specific. It would be great for NCCPHT to create a space for partnerships like that to drastically modernize the current system.

2.4 The need to customize training based on local requirements is an ongoing reality. As one key informant explained: “Everyone is still requiring training based on local needs assessment; so the challenge is to avoid duplication but also build in customization.” Another observed that the state health departments are not always connected to their RPHTC. It’s possible to take content and make it work from state to state; but it’s challenging to make content from state to local usable for both.



2.5 New and different content is needed to address cross-cutting competencies for a changing workforce. The current work on “Framing the Future” for education in public health (ASPPH and ASTHO) and revamping accreditation criteria for schools of public health were cited as initiatives that highlight the need to focus on cross cutting skills and perspectives. A number of comments by key informants addressed current gaps in training:

- *Having management/supervision/interviewing and other topics (financial management, budget preparation, etc.) would be ideal for public health, because those topics are usually not available and so needed.*
- *Inter-professional Education is moving into work place learning (i.e., a hybrid model of content training and training for the skills you need on the job). It's not about technical skills. It's about the application of those skills in complex environments.*
- *One of their big priorities is how policy is integrated into their work and how they can influence policy. We'll look for e-learning courses about that topic and vet them.*
- *We need training on cross cutting skills and perspectives—partnership, communication, systems thinking. We're moving away from silos.*
- *I have just as many public health users as those outside of public health. We need to get outside of our discipline box; for example, think about a high school counselor session on emergency preparedness; or training for law enforcement personnel.*
- *Our mission is to train the existing workforce, but we need to think about the future workforce. I'd love to see a bridge between the academic and professional competencies.*

2.6 LMSs should be more user-friendly. All key informants cited the need to make LMSs more user-friendly. Several key informants, all TRAIN affiliates, talked about TRAIN and the upgrades currently underway to make the site more user-friendly for learners. They cited the advantages of a system that serves so many learners, contains so much content, and provides so many options for customization. However, the trainings are not vetted for quality in a uniform or standardized manner, which may be frustrating for a learner who wants to find the best course on a particular topic. Most informants were optimistic about working together to improve TRAIN for learners and its affiliates.

Most key informants also cited the registration process in many LMSs as a barrier to learners. Some LMSs require learners to create a learner profile and wait for approval before participating in a training (i.e., access is not immediate). Other LMSs require learners to have a username for the regional system and then a separate one for TRAIN. One key informant asked, “How many different usernames do people have to come up with?” In addition, several informants talked about how learners should be able to get information about training programs to determine their appropriateness without having to log in to the system first. Others mentioned the importance of not making learners download software or plug-ins to take a training.

Other key informants talked about making it easier for learners to find appropriate training by improving site navigation (course listing, topic index, search box), vetting courses for content and user-friendliness, communicating via listserv, social media, etc. about new trainings, and using evaluation data to make courses more user-friendly. Some talked about a “concierge” approach to helping learners find the “right” training (i.e., having training coordinators who would identify training based on the learner’s individual needs). One key informant suggested a “how to use this system” feature to help learners who are not familiar with online training. Another suggested an open chat feature to provide assistance with the system for those who don’t have the technical expertise and capability.

2.7 Ideas abound for improving LMSs. Key informants suggested a number of ideas for improving LMSs with standardization as a theme: sign-in; reporting; design, and evaluation. Several key informants also talked about site navigation and helping learners find



the “right” courses by acting as a filter for the large volume of training available. One stated, “We have a lot of training that no one has accessed” citing the challenge for learners of knowing where and how to search. This informant believes that in an ideal system, learners should only have to make 2 clicks to get to training. Another key informant would like to add a topic index to help learners navigate the trainings.

Key informants shared other ideas for improving LMSs in addition to standardization and navigation. One key informant noted that his biggest challenge is to keep all of the links to training updated (training links break twice as often as other resources), and he scans for broken links quarterly. “Sunsetting” is another challenge cited by several key informants. One mentioned that TRAIN administrators can put expiration dates into the system and use it to weed out older training but not everyone is using it and the information is not clear to learners.

Key informants shared other ideas for improving LMSs:

- *Ensure the LMS upgrades work with every search engine.*
- *Program the LMS to keep track of course completions.*
- *Add a feature, like Trip Advisor, for learners to share feedback on individual training programs.*
- *Have an API that people can access from their Facebook account or other social media tool (wouldn't forget how to log in).*
- *Allow various types of media to be uploaded.*
- *Look into charging for courses to help sustain the system.*
- *Being able to incorporate internal and external courses was seen as important.*

One key informant talked about the money, time, and oversight that goes into managing an LMS, and stated, “For it to be good, you need to have your hands in it every day.”

2.8 Collecting and reporting are essential functions of LMSs. All key informants cited the importance of collecting and reporting data through their LMS to meet the requirements of federal, state, and local agencies and accrediting bodies. In some cases, this drove the decision of what system to purchase. For example, one key informant stated that her selection of an LMS was based on the funder’s data collection requirements, her need for customized reports, and a limited budget—all of which severely curtailed her ability to purchase a system with other desirable features (i.e., an LMS that can handle more than 5,000 learners).

Several key informants talked about the burden of reporting requirements and favored centralized data collection. As one stated, “It would be great to have a way to integrate and get that registration data across the board.” Although TRAIN staff noted that TRAIN administrators can use customizable reporting features, one key informant, a TRAIN affiliate, talked about wanting to have an easier way to run reports and said, “I currently generate a whole file and then have to do major clean up/arranging before I can use the data (very time consuming).” Another, with a proprietary system, talked about how expensive and difficult it is to get data in and out.

Key informants also talked about how data collection interfaces with accessibility, especially with respect to login requirements, a burden for the learner. One key informant noted that an LMS has more benefits to the organization using the system than the individual learner except for tracking transcripts.

Key informants also talked about the importance of having evaluation data to improve training programs and the LMS. One key informant wondered if evaluations could be better standardized. She suggested having a bank of tested questions that can be used for training evaluation across programs.



2.9 Self-assessment is a highly desirable feature of an exemplary LMSs. Several key informants want a system which would allow learners to take a self-assessment, build a training plan, indicate desired training program features, get recommendations for training to check out, track training taken, and generate transcripts.

2.10 Learning communities are important to the e-learning experience. Several key informants talked about learning communities as an opportunity for users to connect, engage, and learn from one another, something that was once a key part of in-person training, but lost in the shift to online training. One key informant envisioned a learning community as a group of professionals who can provide a two-minute solution to a question or skill that a learner needs rather than a learner having to find and take a chance on a training course that may or may not have the answer. A few key informants talked about the value of having a group of learners who take a course together and can reach out to the group and instructor for guidance once they're back in the field, applying their training, and facing relevant challenges.

2.11 Training is needed in different formats for different learning needs. Although everyone supported the need for academic, evidence-based courses that met e-learning standards, key informants also recognized the need for other kinds of learning experiences, such as just-in-time 15 minute “bursts” for skill training and workplace learning, a hybrid model of content training and training for the skills you need on the job. Key informants also stressed the importance of having many types of formats for learning—short/long; videos/animation/text—to meet the needs of different learners in a variety of circumstances. A few key informants also talked about providing resources for learners, such as practical job aides and other tools.

2.12 Look to corporate examples of online training. Several key informants mentioned looking at corporate universities (e.g., Google, Apple) for high-end online training system features. One key informant suggested partnering with a corporation that is doing great training.

2.13 Marketing and branding are important for learners to remember the LMSs in the PHLN. Several key informants mentioned marketing and branding as useful ways to direct learners to the sites in the network. The NCCPHT and all of the sites in the network could link to one another. Another key informant suggested that the NCCPHT create a dashboard for a Google search that would search all of the different sites at once. And, another suggested that the network could conduct joint marketing activities (e.g., an e-newsletter or listserv to notify learners about new training, a tool to show learners how to use the network).

2.14 Workgroups should be tapped for ongoing advice. Many key informants expressed their willingness and eagerness to serve on workgroups to assist the NCCPHT in advancing findings and recommendations from this environmental scan. Several commented that the NCCPHT should “call together a meeting of the people and organizations working on developing a system for e-learning.” In addition, several interviews touched on the suggestion that users should be consulted during the planning process: “Practice partners are important (reaching out to the end user in state and local health departments—public health employees!—to be sure this is relevant to their work). You should speak directly to public health practitioners. At the end of the day, they are the end users. Training coordinators or workforce development directors or HR people.”

3. Suggestions for Coordinating and Collaborating

Many of the key informants see an important role for NCCPHT and for collaboration across organizations involved in online training for the public health workforce. Suggestions included:

- *Create a collaborative national learning network with Navigators by topic. The network would work together, learn from each other, and provide different trainings on different*



topics. It's important to get these Navigators integrated into the organizations that can use it. Find the right people (champions) and show them what it will do for them.

- The NCCPHT can serve as a clearinghouse, like the MCH Navigator, for a portal to find all of these places where the training is housed. No one can build a system that can handle all of the trainings that are out there. It's not feasible or manageable. A system like the Navigator that links to courses that are out there would be valuable.
- Add some more funds for the technical infrastructure for the RPHTCs to coordinate. Each region should have a viable LMS that can be linked to others.
- There are amazing opportunities to coordinate and create online training. There are partnerships in place. The NCCPHT needs to reach out to these partnerships and provide demonstrations and funding to support the partnerships. We have leadership in the RPHTCs to push this along and it's a great group to initially test ideas for coordinating and optimizing e-learning courseware.
- Have an umbrella system that does some of the administration (collecting and reporting) but allows for separate systems to house the courses.
- Region 2 uses TRAIN for registration only; nothing lives in TRAIN. They could envision a RPHTC.TRAIN.org as a potential.
- Take advantage of the RPHTCs—they offer a field perspective that we don't have at the national level. They better understand the needs of their populations.
- Sustainability needs to be clear. What would your model look like when there's 100 learners, 1,000 learners, 1 million learners? Is there capacity for that? Is it sustainable?
- Schools of public health, especially at state universities, should make classes, online courses, talks, expert panels, and other events and resources available to health departments.
- We own it [the LMS they have developed]. It cost us to design it, but we don't have to pay an annual fee. The cost is our staff time and consultant time. We are not beholden to anyone for updates. We can change and adapt when we want to. We don't have to rely on others to do it.
- The environmental scan is important. A lot of people in the field are talking about LMSs. It would be helpful to give them a list of the top LMSs, information about their features, and criteria to consider when picking one. We are a partner of TRAIN. I think TRAIN would be interested in knowing what the best criteria is for a LMS. Share your report!





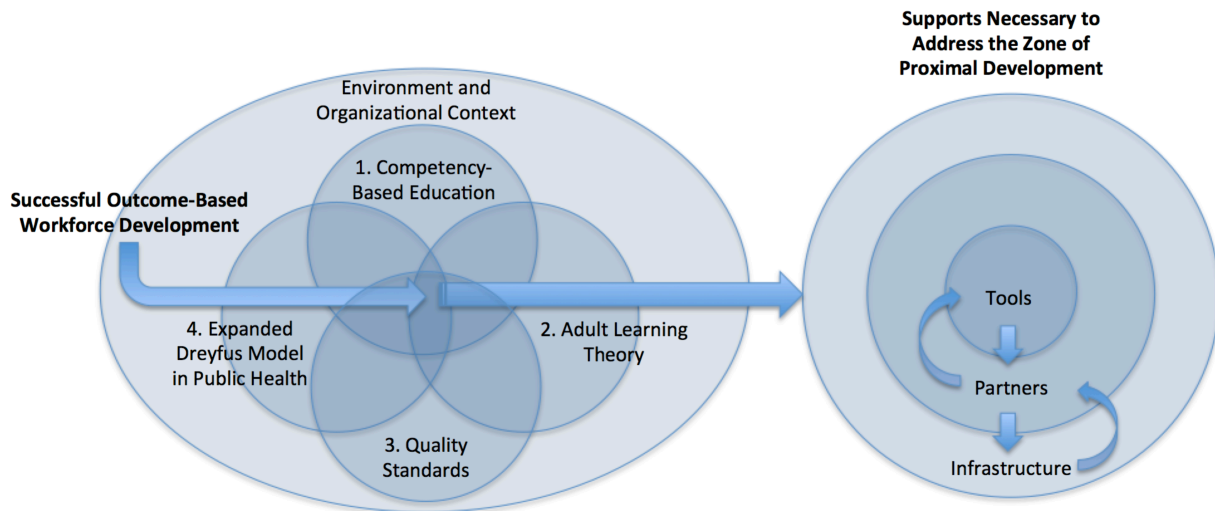
V. RECOMMENDATIONS

Introduction. Integrating over 2,500 data points and 50 findings from the environmental scan, online learner survey, and key informant interviews into a set of concrete recommendations is daunting without the use of a conceptual model to organize spheres of influence that can be acted upon by the PHLN.

This model builds upon the construct of outcome-based workforce development presented in Section II that posits successful learning occurs at the intersection of competency-based education, adult-learning theory, and an expanded Dreyfus Model in Public Health. This intersection is the most opportune environment for learning to occur; however, there remains a *zone of proximal development (ZPD)*,³⁶ which is the gap between what learners can achieve on their own and what is possible with structured assistance. Findings are synthesized into recommendations to address this gap.

For successful learning to occur, this structured assistance – a scaffolding of supports – needs to be present: in *tools* available to those developing learning materials (addressing issues of quality), in *partnerships* of those systems developed to deliver training (addressing issues of data and registration), and in the *infrastructure* within which learning occurs (addressing coordination). Improved tools allow partners within the system to work with a consistent, coordinated approach; stronger partners, in turn, reinforce the infrastructure surrounding the online learner. The 12 recommendations that follow are designed to address all levels of the scaffolding, which allows for more seamless support to the learner. The process is mutually beneficial: an improved infrastructure provides a better environment for all partners, who are then able to refine existing and create new tools to provide successful outcome-based workforce development.

Figure 2: Model of Expanding Influence



This section presents 12 recommendations that directly address the supports necessary to (A) advance standards (tools), (B) advance coordination (partners, beginning with the PHLN with a goal to expand recommendations broader over time), and (C) advance systems (infrastructure). In presenting these recommendations, particular attention is placed on a crosswalk of NCCPHT activities outlined in their cooperative agreement with HRSA.



Summary of Recommendations and Corresponding Evidence

A. Recommendations to Advance Standards (Tools)

- A.1 Utilize quality standards, competencies, and adult learning principles
- A.2 Formalize and standardize quality vetting protocols
- A.3 Improve technical standards and navigation
- A.4 Develop standard course descriptions

B. Recommendations to Advance Coordination (Partners)

- B.1 Standardize data collection, reporting, and evaluation
- B.2 Simplify registration and login requirements
- B.3 Coordinate marketing and communication activities
- B.4 Provide comprehensive reference services

C. Recommendations to Advance Systems (Infrastructure)

- C.1 Increase access to continuing education
- C.2 Support a community of learners approach to learning
- C.3 Incorporate a system to match learner needs to appropriate opportunities
- C.4 Develop a curated portal to provide a course catalog and services for online learning

For each recommendation, findings were grouped together to form the evidence base documenting need. In most cases, there was significant overlap between the data collected among differing collection methods; this thematic saturation of responses strengthens the rationale for the list of recommendations. A summary of the findings that serve as evidence for recommendations is presented in Table 1 below. Specific evidence that supports each recommendation is included throughout this section.

Table 1: Summary of Evidence			
	Scan	Survey	Interviews
A.1	1.2, 1.5, 2.3, 2.2, 3.4	2.1.2, 2.3.2	2.1, 1.2, 2.7, 2.11, 2.12, 2.14
A.2	1.4, 3.1, 3.3, 3.8	2.2.4, 2.2.5	2.6, 1.2, 2.7, 2.12, 2.14
A.3	2.2, 2.3, 3.6, 3.7	2.1.3, 2.2.2, 2.3.2, 2.2.1	2.11
A.4		2.3.2	2.2, 1.2, 2.14
B.1			2.8, 1.2, 2.7, 2.14
B.2	1.3	2.2.3	2.6, 1.2, 2.7, 2.14
B.3	3.2		2.13, 2.14
B.4	3.3, 3.8, 3.6	2.1.1, 2.2.1, 2.3.2	2.2, 2.3, 2.4, 2.5, 2.6, 2.11, 2.12
C.1	2.4	2.3.3	2.14
C.2	3.10		2.10, 2.12, 2.14
C.3	1.2, 3.5, 3.9		2.4, 2.9, 2.12
C.4	3.1-3.10, 1.1, 2.1, 2.3	2.3.1, 2.3.4, 2.2.1, 2.2.6, 2.3.2	1.1, 1.2, 2.2, 2.3, 2.4, 2.6, 2.7, 2.12, 2.14, 3.0



A. Recommendations to Advance Standards (Tools)

A.1 Utilize quality standards, competencies, and adult learning principles.

The issue. Learners look for components that indicate quality online learning opportunities. They want to have a sense of quality before they register/log in to take new courses. However, few learning systems post clear quality and currency standards or link trainings to competencies or adult learning principles as a means to indicate quality.

Recommendation A.1 Quality standards should be agreed upon and used in the development of new learning opportunities or in vetting trainings developed elsewhere (see A.2). Standards should include design, content, relevance, shelf-life, learning objectives, and appropriate educational methods (e.g., just-in-time webinars on emerging issues vs. self-guided courses on advanced topics) and, where possible, relate to competencies and adult learning principles. Standards should be utilized by and posted on each learning system to bolster training content, credibility, and increase likelihood that users will access courses based on perceived quality.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Findings 1.2, 1.5, 2.3, 2.2, 3.4.
- Online Learner Survey: Findings 2.1.2, 2.3.2.
- Key Informant Interviews: Findings 2.1, 1.2, 2.7, 2.11, 2.12, 2.14.

Further discussion. Learners had clear convictions of what they considered quality online learning. Many expressed the need to edit webinars before posting online to shorten and sharpen focus (and edit out dead time). Shorter courses were often preferred or ones that provide the ability to complete shorter sections in separate sessions, but on more advanced topics (*not another Epidemiology 101!*). New material that is general enough to adapt was desired.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The [Portal of Geriatrics Online Education](#) only posts peer-reviewed trainings.
- The MCH Navigator has developed two sets of [protocol questions and inclusion criteria](#) when linking to existing content and developing new content. These are adapted from CDC Scientific Education and Professional Development Program Office guidelines.
- In addition, the MCH Navigator links each learning opportunity to both MCH and Core Public Health Competencies; users can [search](#) by competency or teaching modality.
- The [ADDIE model of development](#) is used by many MCHB-funded distance learning projects in the development of new online learning opportunities.
- [CDC's E-learning Essentials: A Guide for Creating Quality Electronic Learning](#) includes key instructional components and best practices.
- The de Beaumont Foundation has developed [Public Health Workforce Continuing and Professional Education \(CPE\) Quality E-Learning Standards \(1/20/16 draft\)](#), a set of 8 general standards, adapted with permission from the *Quality Matters CPE Rubric*.
- [CDC Public Health Grand Rounds](#) sends out an agency-wide announcement twice per year, inviting new topic proposals. Topic selections and learning modality are based upon the timeliness of the proposed topic and its public health importance.
- NACCHO University [organizes courses](#) by tiers of the Core Public Health Competencies.



A.2 Formalize and standardize quality vetting protocols.

The issue. Public health professionals indicate that learning opportunities systematically reviewed via an established vetting process (e.g., peer-reviewed, review by advisory group) are desirable in that quality has previously been assessed and only the most applicable trainings have been retained/curated for use. This is particularly relevant at a time when an overwhelming amount of online learning materials has become readily available.

Recommendation A.2 NCCPHT should take the lead in developing and utilizing a standard process to vet learning opportunities across the PHLN that includes input from subject matter experts and identifies criteria (A.1) to select high quality relevant training in topics deemed of critical importance to public health workforce development.

The evidence. Findings to support this recommendation include:

- Online Learner Survey: Finding 2.3.2.
- Key Informant Interviews: Finding 2.2, 1.2, 2.14.

Further discussion. Both key informants and learners suggested that NCCPHT coordinate the selection of high quality courses in the topic areas managed by the 10 RPHTCs, to be shared collectively. In addition, learners value peer input in determining quality of learning opportunities. This is particularly interesting at a time when Amazon-like “Rate This Course” technical features are widely replicable. Numerous learners indicated that they would like to see this type of feature in more online learning systems.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field provide examples of how to implement this recommendation.

- The [MCH Navigator](#) employs a three-stage [screening process](#) to identify trainings and resources that are accurate and applicable to MCH professionals in a variety of settings. Materials are removed from the site when links are broken or if newer, higher quality trainings become available.
- The [Association of State and Territorial Health Officials](#) is developing a taxonomy of public health training and will populate it with best-in-class courses. They will develop criteria for reviewing courses based on content and tap an advisory group to vet courses for quality and relevance to their membership.
- The Public Health Foundation report, [Navigational Blueprint Guidelines: Identifying and Disseminating Quality Public Health Preparedness Training Courses on TRAIN](#) (2014), presents criteria for vetting public health preparedness training. It can be adapted for vetting trainings on other topics.
- The [Region 6 South Central PHTC](#) updated their training needs assessment. The [updated analysis](#) included a systematic, competency-based assessment of existing training courses and emerging training needs that were identified by practice partner representatives.
- [TRAIN.org](#) maintains a system for learners to rate courses. In addition, several commercial learning systems such as [Lynda.com](#) and [Class Central](#) have easy 5-star rating systems that could be utilized in public health.
- The Region 2 Public Health Training Center offers [learner comments](#) and [samples](#) of their courses before registration.



A.3 Improve technical standards and navigation.

The issue. Learners continue to express difficulty with accessing online learning opportunities due to technical issues such as not being able to connect from a work or even home office due to security issues or the inability regarding or difficulties with downloading new/updated software. In addition, few learning systems have detailed technical and logistic information, including information on accessibility for users who are differently able. Learners have indicated that more intuitive, consistent navigation would also assist in finding and completing online learning opportunities.

Recommendation A.3 Basic technical requirements should be established that take into account a “lowest common denominator” of browsers and software versions. Courses should be developed that do not rely heavily on technologies that could impede utilization. Information on technical requirements should be posted in a prominent location on each learning system (or linked to a common technical page at NCCPHT) and should include what software versions are needed, if cookies are required, security issues, and information on how to use the site and troubleshoot, including links to download applications/upgrades and active TA if issues are experienced. Information on how to use/navigate the site should also be included for individual use and to encourage use at an organizational level.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Finding 1.4, 3.1, 3.3, 3.8.
- Online Learner Survey: Findings 2.2.4, 2.2.5.
- Key Informant Interviews: Finding 2.6, 1.2, 2.7, 2.12, 2.14.

Further discussion. The frustration of professionals who cannot access learning materials cannot be overstated. New technologies should be embraced, but thoroughly tested before use. Content that can be shared via applications that require no additional downloads, updates, or the most current browsers are key to providing a positive learning experience while being mindful of real constraints. Users appreciate use of widely accepted learning platforms (e.g., Adobe Connect) while understanding that an increasing amount of learning occurs on mobile devices.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- [Region 6 South Central Public Health Training Center](#) has recently upgraded its LMS (Moodle) by converting all of its videos to a “user-friendly, pop-up free” technical format and redesigning its user interface to improve access, navigation, and usability.
- The Northwest Center for Public Health Practice includes a page of [technical requirements](#) and provides an email link from each course for accessibility issues.
- Region 2 Public Health Training Center has a [help](#) page that includes a video explaining what technology is needed and information on accessibility.
- The MCH Navigator has a page on [technical standards and troubleshooting](#).
- CDC Training and Continuing Education Online has a [help](#) page that discusses technical specification, browser versions, and cookies.
- The Health Information Group has developed an [Online Learning Toolkit](#) to assist in the development of distance learning materials.



A.4 Develop standard course descriptions.

The issue. Learners rely on robust course descriptions to choose which online learning opportunities match their needs, especially if they have to register/log in before accessing course materials. However, many learning systems provide incomplete descriptive information up-front.

Recommendation A.4 Develop and utilize a standard set of course descriptors across the PHLN that includes the following minimum information: annotation, learning objectives, audience, creation and expiration dates, source/funder, presenter(s), modality/format, competencies addressed, length, learning level/prerequisites, costs, technical requirements (A.3), and supplemental materials.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Findings 2.2, 2.3, 3.6, 3.7.
- Online Learner Survey: Findings 2.1.3, 2.2.2, 2.3.2, 2.2.1.
- Key Informant Interviews: Finding 2.11.

Further discussion. Learners indicated that the more information presented before they needed to sign up for a course, the more likely they were to sign up. Information on how to register, course classification (topics addressed), and related courses would also be helpful information to provide to the learner. The ability to search by components of course descriptions (e.g., find all courses on a topic that are under 30 minutes long) would be an advancement to many systems. Additional resources (e.g., PowerPoint slides, transcripts) and tools to implement learning were identified as important (the Region X Northwest RPHTC does this consistently).

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field provide examples of how to implement this recommendation.

- The [MCH Navigator](#) provides standard course descriptions that incorporate 12 variables including annotation, learning objective, and competencies addressed. An example can be found [here](#).
- The [Region 6 South Central PHTC](#) presents concise course descriptions with the name of the course, course beginning and ending dates, level of training, contact hours, and brief annotation. Many entries link to a course syllabus that lists the instructor, a detailed description, learning objectives, and competencies addressed. See [example](#).
- The [Michigan PHTC](#) presents a brief course description along with information about availability, cost, and credits offered. Learners can click on tabs for course details (i.e., intended audience, course objectives, sponsors, technical information, etc.) and instructor information. See [example](#).
- [Coursera](#) offers a one-page description for every course in its system that includes an overview about the course, creation date, and funder; creator and presenters; syllabus; and ratings and reviews. See [example](#).
- [Udemy](#) also offers a one-page description for every course in its system. Listed at the top are the student ratings, presenter, cost, format, and language. A short video presents a video clip of the course to give learners a flavor for the presenter's style and course coverage. Sections below answer the questions, "What will I learn?"; "Who is this for?"; "Why should you take this course?" and "Students who viewed this course also viewed". The curriculum, instructor biography, and reviews follow. See [example](#).



B. Recommendations to Advance Coordination (Partners) (PHLN to begin with, others in time)

B.1 Standardize data collection, reporting, and evaluation.

The issue. Data collection, reporting, and evaluation are essential functions of LMSs. Users want to minimize time spent registering/completing forms before the learning experience. However, data collection is needed to effectively monitor and evaluate user satisfaction levels, increases in knowledge and skills, ongoing workforce development, and other markers of improvement.

Recommendation B.1 Where possible, coordination among systems across the PHLN could standardize the data collection process and result in users having to enter less data. A coordinated data collection, reporting, and evaluation component should be included in NCCPHT's responsibilities, which would include coordinating with evaluation staff within each of the 10 RPHTCs and would reflect changes in registration/login described in B.2. It is also recommended that HRSA streamline the data that they request of the PHLN.

The evidence. Findings to support this recommendation include:

- Key Informant Interviews: Findings 2.8, 1.2, 2.7, 2.14.

Further discussion. Many key informants were in favor of “an umbrella system that does some of the administration (collecting and reporting) but allows for separate systems to house the courses” while being mindful of health department needs, PHAB requirements, etc. It was also made evident that valuable project time was being spent repetitively collecting and reporting data by individual RPHTCs when it could be more efficiently consolidated by the NCCPHT.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The TRAIN enhancement will include upgraded reporting capabilities providing: quicker reports, scheduled reports, easier maintenance/management, easier automation and programming, more user friendly *ad hoc* reporting interface, ability to produce more visually-oriented reports (charts, graphs, etc.), extended reporting capabilities for “super course providers.”
- The MCH Navigator has the ability to download aggregated data from its [online self-assessment](#) to show increases in knowledge and skills over time. In addition, data is collected from short pop-up forms before ([2-questions](#)) and after ([5-questions](#)) learning projects to track learning. No registration is required (through the Navigator) to access individual learning opportunities (registrations may be required outside the Navigator).
- HRSA-funded AIDS Education Training Center (AETC) Regional Model. Each AETC region has a program evaluator that follows mandates from HRSA on specific variables to collect from participants during training events. Each regional evaluator is coordinated by the larger [AETC National Evaluation Center](#) that provides leadership in the development of evaluation models for determining the effect that AETC trainings have on behavior change and improved patient outcomes. This is a model that could be adapted by the PHLN; staff at NCEMCH at have served as evaluators for the AETC and can be tapped for lessons learned.



B.2 Simplify registration and login requirements.

The issue. The need for registration and course completion data is critical at national, regional, and local levels. However, course registrations/logins are undeniable barriers for online learners. Research indicates that between [54%](#) and [86%](#) of users report that they would rather leave a site than have to register before they get the information or product they desire.

Recommendation B.2 NCCPHT should investigate alternate ways for users to register/log in and should engage HRSA, the RPHTCs, and other groups who need to collect user data. Questions should be asked about what data is needed for reporting and how best to gather this data. For example, could registration/login happen as a learner exits/completes a training? Could registration/login occur via the learners' social media account ([social login](#))? Could the PHLN investigate utilizing TRAIN.org to handle trainings across the network? Could one of the RPHTCs be funded to expand their registration process (e.g., Heartland Center Learning Management System)? Could the PHLN invest in development of a [single sign-on](#) (SSO) system or a system where registration is handled by sending a link to a user's email for login, eliminating the need for remembering passwords?

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Finding 1.3.
- Online Learner Survey: Finding 2.2.3.
- Key Informant Interviews: Findings 2.6, 1.2, 2.7, 2.14.

Further discussion. The sheer number of comments asking for a simpler or unified registration process or no registration at all made it one of the most talked about topics of the online survey and key informant interviews. This is an area in which a technical solution could provide options, but will require considerable thought, discussion, and planning to reach a solution that eases “registration/login burden,” but provides the data needed. An innovative solution could be the use of social login, meaning users can sign in to a new website with their existing social media account, such as Facebook or Twitter, rather than having to fill out another form. Data is passed from system to system. The potential is exciting: [65%](#) of adults in America currently have social media accounts and [77%](#) of online users state that they would use social login to access content on new sites.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- Coursera offers [social registration options](#) (via Facebook) to register/login as well as the ability to create a new account with its own set of credentials (user name and password). Its courses come from six major universities.
- Similarly, [Course Buffet](#) offers social registration (see link at top right of screen), which is its preferred method of registration/login, although it also allows traditional registration.
- Georgetown University has invested in a single sign-on system that allows faculty and staff to use one user name and password for all unrelated systems that they interact with at the school (e.g., email, Blackboard, financial management, student records). Each system is operated by a different company, but users log into one application that manages their data and connects with each application separately, allowing for seamless access to multiple systems.



B.3 Coordinate marketing and communication activities.

The issue. Learners want to be notified of course offerings on multiple public health topics from trusted sources, but often suffer from “information overload” related to receiving too much information from multiple sources. They do not want to hunt for training opportunities on their own. They appreciate receiving email newsletters (and reminders) about upcoming trainings that are pre-vetted from a few trusted sources. A comprehensive communication vehicle would highlight multiple partners while providing a quick scan of the field.

Recommendation B.3 Consider producing and disseminating a comprehensive electronic newsletter that features information from across the PHLN and its partners (e.g., ASTHO, NACCHO, CDC, the MCH Navigator) that includes a broad spectrum of upcoming trainings with links to registration, reviews of existing trainings, new resources relevant to public health workforce development, and other features, such as promising practices. Other means of alerting the public health workforce to learning opportunities through coordinated social media could also be developed and implemented.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Finding 3.2.
- Key Informant Interviews: Finding 2.13, 2.14.

Further Discussion. Many learning systems use newsletters and social media to disseminate training information; many learners depend on these communications to select CE opportunities. Aggregating information about online training from key national and regional partners would be a valuable planning tool for state and local training coordinators as well as individual learners. As noted: “Marketing and branding are important for learners to remember the [partners] in the national learning network.” The process of vetting content for a newsletter is also critical in that it would provide the cumulative knowledge base for a comprehensive learning portal (C.4).

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The [MCH Navigator](#) sends a quarterly training and resource [newsletter](#) and lists upcoming trainings on its website and via [social media](#).
- The [National Collaborating Centre for Methods and Tools \(NCCMT\)](#) sends a [weekly news digest](#) that includes information about upcoming learning opportunities. NCCMT also lists upcoming training on an [events calendar](#) and via social media.
- [FutureLearn blogs](#) on categories in their course offerings, such as favorite moments in learning, new courses, facts and figures, and just for fun.
- [Nexus Learning System](#) announces training via a [newsletter](#) and social media. Nexus also invites learners to [share events](#) on its website.
- The [CDC Learning Connection](#) announces training opportunities by CDC, CDC partners, and other federal agencies through its website, social media, and an [e-newsletter](#).
- The [Northwest RPHTC](#) uses an [alert](#), a quarterly [newsletter](#), and social media tools to announce upcoming trainings.
- The [Partners in Information Access for the Public Health Workforce](#), which includes academic and professional organizations, governmental agencies, and health science libraries, currently has a *short, daily* newsletter.



B.4 Provide comprehensive reference services.

The issue. Learners and training coordinators find it difficult to hone in on the best training to meet their needs amidst the clutter of online training. Duplication of course content is pervasive and the need to customize training based on local requirements is an ongoing reality.

Recommendation B.4 Provide comprehensive reference services for the users of online training, training coordinators, and course developers. An NCCPHT information specialist can point to the best training to meet the learners needs; identify existing training that can be customized for another health department or organization's needs; and teach learners and coordinators how to use a centralized LMS and website (see Recommendation C.4).

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Findings 3.3, 3.6, 3.8.
- Online Learner Survey: Findings 2.1.1, 2.2.1, 2.3.2.
- Key Informant Interviews: Findings 2.2, 2.3, 2.4, 2.5, 2.6, 2.11, 2.12.

Further discussion. A reference librarian or knowledge management professional can help learners and training coordinators find the best online learning courses to meet their needs. In addition, when a state wants to train its workers on a particular topic or issue they can, as a first step, turn to a reference librarian to find out if a similar training exists that can be adopted or adapted to meet their needs. This reference librarian can also instruct training coordinators and learners on how to effectively and efficiently search a centralized website, hosted by NCCPHT, to make full use of all of its features (see Recommendation C.4). Whether at a public or academic library or in a specialized setting, such as a coordinating center for online training, reference librarians can point learners to the best resources (training course, document, book, website, etc.) to meet their needs and instruct learners on how to search the systems that house the resources or information about them. Reference services are often available via e-mail, chat, and phone in addition to the traditional in-person service.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field provide examples of how to implement this recommendation.

- The [Lynda.com](#) subscription for the Georgetown University community offers several [video clips](#) about how the community can use the system to meet their needs. The community is invited to reach out to university librarians via online chat, e-mail or phone for guidance on which tutorials to use to meet instructors' and students' needs.
- [UpToDate](#) offers an [end-user customer support service](#) via phone and e-mail and a [series of demos and a tutorial](#) about how to use the service.
- The [MCH Navigator](#) presents a virtual tour, presentations, and background about [how to use the site and examples of use](#).
- The [Heartland Center for Learning Management](#) offers an LMS [orientation program](#) and [user guide](#).
- The Northwest Center for Public Health Practice offers [PH LearnLink Help](#), extensive How-To topics on how to use their system and [direct links](#) to specific staff members for TA, training, research, evaluation, and communications assistance.



C. Recommendations to Advance Systems (Infrastructure)

C.1 Increase access to CE.

The issue. Users expressed not only the need for sources offering more learning opportunities with CE credits, but wanted multiple forms of CE credits (e.g., CME, CEU, CNE). Learners are more apt to take courses that offer CE as they perceive this as an additional indicator of quality. CE is also an incentive for public health professionals with licenses or certifications. However, CE was offered to a lesser extent than expected, and was not as visible within online learning systems as it could be. When credits are offered, learners want it clearly stated in the course description and accessible through simple steps for completion and documentation.

Recommendation C.1 At both the national and regional levels, learning systems should clearly indicate which courses provide CE and should allow learners to search courses by CE type or by profession. There should also be a repository with the NCCPHT that aggregates a set of vetted CE courses in one place. Supplemental CE material related to the process for acquiring credit should also be provided in one centralized location along with frequently asked questions; technical assistance might also be provided. The NCCPHT should explore becoming a source that provides CE credits for its affiliates' learning opportunities.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Finding 2.4.
- Online Learner Survey: Finding 2.3.3.
- Key Informant Interviews: Finding 2.14

Further discussion. Free CE was preferred, but low-cost credit was acceptable. There was a definite need to provide certificates of completion/attendance at the end of all learning opportunities, irrespective of CE offering. Learners want documentation to acknowledge completion for professional development requirements *and are willing to go through registration/login processes* to receive CE credits.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The MCH Navigator offers an [advanced keyword search option](#) that allows users to search the learning opportunities database by CE credit. All of the MCH Navigator trainings that offer CE credits are free to the user.
- [Public Health Live - On Demand](#) from the School of Public Health at the University of Albany, State University of New York, has a one-stop shop repository of CE courses that can be accessed without registration, and a link to instructions and registration/post-test for those learners who want CNE, CME, or CHES credit.
- [CDC Learning Connection](#) provides clear access to CE by coordinating registration and access through cdc.TRAIN.org. Clear instruction on [how to obtain CE](#) are provided.
- The Region 2 Public Health Training Center offers very [clear CE instructions](#) as well as [course overviews](#), [course samples](#), and [learner comments](#).
- EdX has an intuitive [graphical interface](#) that highlights courses that are “credit eligible.”



C.2 Support a community of learners approach to learning.

The issue. Studies show that competency- and skills-based professional development is more effective when a component of group or community learning is involved. This is especially true in public health where the workforce is called on to put learning into practice quickly. Shared learning is often lacking in individual online professional development, where learning often occurs asynchronously without a support group of colleagues. A “community of learners” has been identified as an innovative wrap-around structure to augment individual adult learning.

Recommendation C.2 NCCPHT should build on their experience and strengths in managing learning communities to promote communal learning and should create a communal learning structure — possibly a learning community/community of learners at a national or regional level — to augment learning resources provided by the RPHTCs and other online learning systems with the goal of further engaging professionals in online learning and providing support to move learning from theory to practice.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Finding 3.10.
- Key Informant Interviews: Finding 2.10, 2.12, 2.14.

Further discussion. The public health workforce is largely aware of the benefits of interactive learning, and many of the key informants championed weaving interaction into online learning. Suggestions included a wide range of ideas, such as question-and-answer-based case studies, participatory discussion lists, shared virtual work space, online mentors, and virtual town halls. A successful strategy that was repeatedly discussed would involve the ability for a professional to learn information online, utilize the knowledge and skills gained on the job/in the field, then report back to a virtual community of learning experiences and lessons learned for replication among other learners.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The MCH Navigator has an extensive [Learning Collaborative](#) that encourages dissemination of information about trainings, feedback about specific trainings and products, asking of training- or content-specific questions, and interaction with training mentors drawn from Navigator staff or an Expert Panel Training Subcommittee.
- In addition, the MCH Navigator is wrapping up an extensive year-long [learning program](#) that combines micro-learning, spaced-learning, and interaction. Each week, participants are asked to [begin a discussion](#) on information overviews, learning opportunities, and implementation strategies.
- The TRAIN discussion list is an active platform for answering questions and getting guidance on training issues as they arise. The discussion list posts 2-10 messages per day. In addition, TRAIN has a robust email newsletter and social media accounts, such as [Facebook](#) and [Twitter](#), that generate discussion.
- The Institute for Healthcare Improvement: Open School offers a series of [online activities](#), including videos, case studies, exercises, and patient stories, to facilitate group learning.
- The [Public Health Quality Improvement Exchange](#) serves as an online community of learners with resources to share information about QI in public health.



C.3 Incorporate a system to match learner needs to appropriate learning opportunities.

The issue. While many recent needs assessments have been conducted to broadly identify current and emerging learning needs of the public health workforce, professionals indicate the desire to be able to assess their individual needs and be directed to customized resources. Research further indicates that guided learning is effective in connecting busy professionals to learning materials that meet their need. However, few online learning systems utilize a self-assessment feature that can be incorporated into professional development plans.

Recommendation C.3 NCCPHT should continue to conduct needs assessments and analyze data from other assessments in the field and should provide a form of self-assessment for users to match individual learning needs to learning opportunities produced by RPHTCs and other online learning systems.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Findings 1.2, 3.5, 3.9.
- Key Informant Interviews: Findings 2.4, 2.9, 2.12.

Further discussion. Most learners prefer some form of guided learning to identify appropriate learning opportunities based on need. Survey results and key informant interviews indicate that the more guided the experience, the more likely that professionals will receive an educational experience that meets their need, the more satisfied they are with the overall experience, and the more likely they are to return for continued learning. Technology is sufficiently advanced to move beyond paper and pencil self-assessments. Fully-functional online self-assessments are rare and new to the field, yet provide for innovative ways to streamline online learning.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The MCH Navigator provides a fully web-based [online self-assessment](#) that users can use to log in, answer questions related to MCH Leadership Competencies, and receive a personalized learning plan that indicates strengths and areas of needed growth along with direct access to courses chosen to address those needs and strategies to continue learning. The learning plan also collects data longitudinally that can be used individually by the professional or downloaded in aggregate to track increases in knowledge and skills over time for groups of users. See [this article](#) on how states have used the Navigator.
- [TRAIN.org](#) provides three self-assessments that address the Core Competencies for Public Health Professionals ([Tier 1](#) | [Tier 2](#) | [Tier 3](#)) that users can download (as a PDF), fill out, see scores generated by the self-assessment, and read guidance to determine next steps. Users can save a copy of the self-assessment in their “My Learning” page.
- The Region 6 South Central Public Health Training Center has conducted an extensive competency-based [needs assessment](#) of existing training courses and emerging training needs that were identified by practice partner representatives.



C.4 Develop a curated portal with a course catalog and services for online learning.

The issue. Finding and accessing online learning opportunities, even those developed by the RPHTCs and local training sites, remain a substantial barrier. All too often, learners give up before receiving critical information to better conduct their work. While access to online courses is available from an entire network of training centers, it remains extremely difficult for learners to access the right training at the right time. Coordination and leadership from NCCPHT is needed to create an encompassing “best-in-class” public health online training system. This system would incorporate previous recommendations as critical components, including a way to match learners to trainings and participate in a learning community.

Recommendation C.4 Develop and maintain a user-friendly, searchable, highly curated library or course catalog of online trainings, resources, expertise, and services to act as a “concierge” service to the best online trainings by category offered by the PHLN and partners in the field. Use this online database portal of annotated “best-of” course descriptions and links as the *flagship tool* in providing “wrap around” services described in previous recommendations (e.g., TA/reference services, assessment and learning plan, community of learners) to advance relevant, state-of-the-art online training in public health workforce development through guided and communal learning. This portal would act similarly to a patient navigator in connecting online learners to courses that address their learning needs, thus providing critical quality review and ensuring that materials developed elsewhere are easily accessible and utilized.

The evidence. Findings to support this recommendation include:

- Environmental Scan Database: Findings 3.1-3.10, 1.1, 2.1, 2.3.
- Online Learner Survey: Findings 2.3.1, 2.3.4, 2.2.1, 2.2.6, 2.3.2.
- Key Informant Interviews: Findings 1.1, 1.2, 2.2, 2.3, 2.4, 2.6, 2.7, 2.12, 2.14, 3.0.

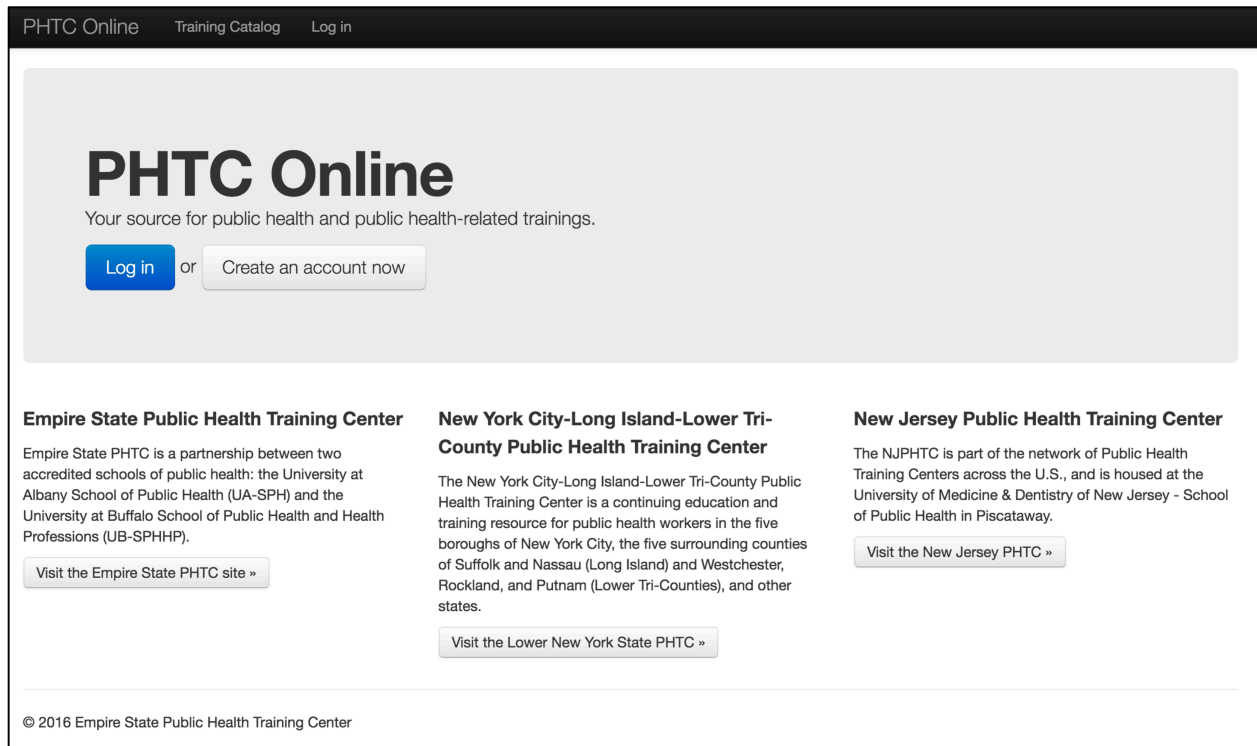
Further discussion. The challenges faced by end users and course developers requires resources, expertise and services to support the RPHTCs and leverage the assets of the PHLN and its partners to maximize the coordination, dissemination, and effective use of online training. It means building and maintaining a quality, competency-based, online LMS that serves as a curated resource for the e-learning projects of local, regional, and national partners. This system would be continuously updated with the latest developments in technology and instructional design and would be responsive to the needs of a changing public health workforce. A core asset of the curated portal would be a searchable database of vetted courses—a “best of” catalog that includes entry level and advanced course offerings; easy-to-find courses that provide CE; SCORM-compliant content; and courses that offer options in length, modality, and interactivity. It should be noted that development of this system would not be a duplication of other, related efforts for two reasons: (1) the system would be a single, comprehensive public health “learning catalog” of courses with standardized course descriptions and quality standards linking online learners to competency-based, adult learning on all public health topics, organizing what has been developed by the PHLN and partners; and (2) it would link directly to courses that are housed in current systems, providing a “no wrong door” approach for the user.

Development of such a system will require focused effort and resources. A phased approach implemented over time could allow for a thoughtful, yet achievable system. It is recommended that a workgroup be consulted in exploring options and establishing potential next steps.

Build on a previously developed system. A promising practice that deserves particular attention is the currently existing (but no longer maintained) [RPHTC Online](#) (see Figure 3).



Figure 3: RPHTC Online



This system aggregated courses from the Empire State Public Health Training Center (who developed the site), the New York City-Long-Island-Lower Tri County Public Health Training Center, and the New Jersey Public Health Training Center in a combined “Training Catalog.” It allowed for a single sign-on and linked to each of the RPHTCs. Equally as important, each of the RPHTCs linked back to RPHTC Online via a common top navigation bar that was consistent across all four sites (it should be noted that the common top navigation has been modified since the time of this study). This model should be adapted by the NCCPHT and the 10 RPHTCs to link all sites together in an easy-to-implement, yet highly impactful way. As part of a phased approach, this could be implemented later on and incrementally improved as a one-stop shop is developed.

Promising practices. The following examples from the Environmental Scan Database and additional resources from the field can be used to implement this recommendation.

- The [MCH Navigator](#) uses a custom LMS that aggregates trainings in support of the 12 MCH Leadership Competencies. The site contains over 300 highly-vetted trainings developed by experts in the field and reviewed by a standing committee. The site includes an online self-assessment that integrates with the LMS; over 20 topic-specific “training bundles;” a calendar of upcoming trainings; a micro-learning system; and numerous forms of communication, including electronic newsletters and social media.
- The National Library of Medicine (NLM) offers [MedlinePlus](#), a one-stop shop for high-quality, accurate, authoritative, and up-to-date consumer health information (see its [quality guidelines](#)). The site is searchable by health topic (A-Z list, categories, such as disorders and conditions, and search box) and format (e.g., videos, tools). An [advisory group](#) meets three times a year to advise NLM on issues involved in developing, maintaining, evaluating, and promoting MedlinePlus. The site includes [resources for teaching MedlinePlus](#) to consumers and uses e-mail updates, a quarterly magazine, RSS feeds, and social media to communicate about new resources, tools, and features.



- The [National Maternal and Child Health Oral Health Resource Center](#), a one-stop shop on oral health for state Title V programs, presents a searchable online library of vetted resources, including trainings, with descriptive entries for each. The Center also offers topical guides on key topics that list its publications and resources from the library. New resources are announced via alerts, e-mail lists, newsletters, and social media. Trained professionals are available by phone and e-mail to direct professionals to the best resource to meet their needs.
- The American Planning Association's [Knowledge Center](#) presents searchable collections of online trainings, publications, research, images and other media about developing living communities. Detailed descriptions are provided for all resources. A [Planning Advisory Service](#) is a subscription-based, personalized service that provides reports, information packets, an e-newsletter and alert, and on-demand research services.
- The [Children's Safety Network \(CSN\)](#) is a one-stop shop on injury and violence prevention for state Title V programs. CSN presents topical guides to publications, infographics, webinars, state program information, and links to websites and useful publications. Information is vetted by injury and violence prevention professionals. CSN offers [technical assistance](#) to state health department staff and a calendar of events. CSN communicates via newsletter, blog, and social media.

What we heard from the field.

- *Use a common platform so that all are likely to have access to the training.*
- *User-friendly site with access to multiple types, levels and subject matters.*
- *Current topics of interest to a specific professional/occupational group.*
- *Have a single source for training, advertise that source, and make it easy to use.*
- *A best-in-class online training system would be adaptable and independent enough that it could respond in real time to technology advances.*



VI. DISCUSSION OF ISSUES AND NEXT STEPS

Discussion. From the environmental scan, online user survey, and key informant interviews, come a wealth of findings and recommendations to improve online training for the public health workforce to augment their knowledge and skills in addressing mounting population needs at a time of great change in the field and in technology. What previous research has shown, and what this study has confirmed, is that online learners can accomplish much on their own, but there is still a gap (the *zone of proximal development* discussed in Section V) between what they can do on their own and what educational supports they need to effectively integrate new paradigms into their skill sets that can be used in their daily work.

The findings of this report paint a consistent picture showing the critical need for structured, curated learning; it is not enough to provide a learner access to a computer and expect them to learn from the myriad excellent online courses that are out there. The image of a physical library is relevant: on the Internet, excellent courses are like thousands of library books strewn all over the floor. The knowledge contained in those volumes is there, but it is next to impossible to find just the right information when needed. What is needed, and what the NCCPHT and RPHTCs provide so well, is the expertise to pick those resources up off the floor and to arrange them into organized, strategic learning curricula that are relevant to the learning needs of public health professionals. There is no shortcut to this process, no magic Google button that can do it automatically. The management of online training is critical to optimize learning.

The field has progressed significantly in the development of competency-based learning materials that are based in adult learning principles and that allow for acquisition of skills over the course of a career. However, the needs of the workforce have also grown significantly and the challenges in finding quality material quickly have exploded exponentially. At this crossroads, it is critical to expend even greater effort to ensure that learners are guided to the resources they need, rather than have them spend their time sifting through thousands of web links, hoping for just the right training.

The role of online learning systems is to fill the gaps between unstructured learning done in front of a computer and traditional, in-person education with the supports that a physical classroom provides. Online learning accomplishes this with an infrastructure provided by curated, structured systems. The recommendations of this report, if implemented by the NCCPHT, RPHTCs, and their partners – at the federal level, among other public health training centers, with online educators in other fields, and coordinating with individual content developers – will build additional supports around the online learner, enabling more efficient learning.

What this report provides are specific streams of activities that build upon one another, through actions that will strengthen tools, partnerships, and the overall PHLN; these activities are indeed iterative and can be neatly organized into the curated portal approach outlined in Recommendation C.4 as an eventual goal. Direct correspondence exists between the recommendations from this report and the charge laid out by HHS in the Funding Opportunity Announcement for the NCCPHT:

“NCCPHT will ensure a shared vision and mission across all Regional RPHTCs by: providing TA; coordinating the standardization and vetting of course offerings, evaluating and assessing needs nationally; spearheading the replication of evidence-based products and sharing of resources; and improving the collection of data to demonstrate program impact. In addition, the NCCPHT will serve as a clearinghouse for public health education and training, and ensure that all training is cross-cutting, and courses are non-duplicative.”³⁷



Next steps. The list of recommendations is ambitious, but achievable with commitment from partners at every level working to provide online learning to the public health workforce. This section provides an overview of what strategies are needed to implement these recommendations rather than a step-by-step guide that would attempt to dictate one approach over others. What is most clear is that partnership is critical, and that consensus must be built in developing next steps. This is not to say that next steps cannot be achieved in the short-term; quite the contrary. It is essential to keep momentum going to follow up this report, especially in light of the changing landscape. NCCPHT has made great strides in collaborating with the RPHTCs to form the PHLN; there are many activities that can happen immediately that will have significant impact while longer-range strategies are set into motion.

A phased approach should be implemented with each of the recommendations that includes immediate next steps (to be completed over the next 3-6 months), short-term goals (6-12 months), mid-range goals (1-2 years), and long-term goals (continuing into the next funding cycle for both NCCPHT and the RPHTCs). Immediate steps include deciding what activities the NCCPHT and RPHTCs can achieve now to lay the foundation for long-range recommendation implementation. This can be conducted with a very small group of partners and with federal input so that “perfection does not interfere with completion.” Progress on each of the recommendations will serve as a foundation to gather partners and affirm plans for later action. This approach follows the Plan-Do-Study-Act (PDSA) approach for accelerating improvement on a smaller scale with the goal of then spreading changes through additional phases of addressing recommendations.

Each of the recommendations will require partners and consensus-building at multiple levels – for example at the national, state, and local levels, involving NCCPHT and federal partners (e.g., HRSA, CDC), the RPHTCs and other public health partners in the field (e.g., Public Health Foundation, CDC Learning Connection, MCH Navigator), and those at a community/course developer level (e.g., local training sites and affiliates, individual course developers). What becomes apparent is the need for a planning tool for each of the recommendations (or for each set of recommendations using the structure established in Section V), such as a matrix of time frames and partners (see Table 2). An immediate step for NCCPHT and HRSA is to identify achievable, “easy-win” immediate steps for each recommendation that can be implemented in a PDSA manner as well as outlining short-, mid-, and long-range goals and activities, considering which groups and individuals would be advantageous to include during each of these phases.

Table 2: Planning Matrix	Immediate	Short-Term	Mid-Term	Long-Term
Level 1: National/Agency Level				
Level 2: Partners/Regional				
Level 3: Local/Course Developer				

For many of the recommendations this means building on activities already underway, as cited in the findings and promising practices in Sections IV and V. Hopefully this report, and its recommendations, can serve as a framework to empower key stakeholders to move forward, together, to advance the quality and effectiveness of online public health training systems.



REFERENCES

- ^{1,17,19,24} Grason H, Kavanagh L, et al. "Findings from an Assessment of State Title V Workforce Development Needs." *Maternal and Child Health Journal* (2012) 17:7-20.
- ² Hunter EL. "Rebooting Our Boots on the Ground." *J Public Health M Practice* (2015) 21(6 S): S1-S2.
- ³ Baker EL. "Addressing Urgent Public Health Workforce Needs: Building Informatics Capacity and Strengthening Management and Leadership Skills." *J Public Health M Practice* (2015) 21(6 S): S5-S6.
- ⁴ Linde SR et al. "Health Resources and Services Administration Perspective on the Public Health Workforce Interests and Needs Survey." *J Pub Health M Practice* (2015) 21(6S): S9-S10.
- ⁵ A Skilled Workforce for Strong, Sustainable & Balanced Growth: G20 Training Strategy 2010.
- ^{6,22} Public Health Accreditation Board, Standards and Measures. Version 1.5. Adopted December 2013.
- ^{7,8} U.S. Centers for Disease Control and Prevention. *Public Health Infrastructure: A Status Report*. Atlanta: U.S. Centers for Disease Control and Prevention, March 2001.
- ^{9,16} ASTHO. Public Health Workforce Interests and Needs Survey (2014). <http://astho.org/phwins>.
- ¹⁰ University of North Carolina at Chapel Hill, National MCH Workforce Development Center. 2014. *A Snapshot of Current Title V Workforce Needs*. Chapel Hill, NC: University of North Carolina at Chapel Hill, National MCH Workforce Development Center.
- ^{11,12,13,31-35} Koo D, Miner K. "Outcome-Based Workforce Development and Education in Public Health." *Annu Rev Public Health* (2009) 31:253-269.
- ^{14,26} Robert Wood Johnson Foundation. *Blueprint for a Healthier America: Modernizing the Federal Public Health System to Focus on Prevention and Preparedness*. Princeton, NJ: 2008
- ¹⁵ Kaufman NJ et al. "Thinking Beyond the Silos: Emerging Priorities in Workforce Development for State and Local Government Public Health Agencies." *J Public Health Management Practice* (2014) 20(6): 557-565.
- ¹⁶ National Association of County and City Health Officials. *The Local Health Department Workforce: Findings from the 2005 National Profile of Local Health Departments Study*. Washington, DC: 2007.
- ¹⁸ Alexander GR, Petersen DJ, et al. *Graduate and Continuing Education Needs in Maternal and Child Health: Report of a National Needs Assessment, 2000-2001*. University of Alabama at Birmingham. Birmingham, AL 2001.
- ²⁰ Chaudhry B, Wang J, & Wu S. et al. "Systematic review: Impact of health information technology on quality, efficiency, and costs of medical care." *Annals of Inte Medicine*. 2006; 144(10): 742-752.
- ²¹ AAFP. "Study finds gap exists between technology expectations, reality: Interoperability, care coordination issues create problems." *AAFP News Now*. 2010.
- ²³ Search conducted 01/16/2016.
- ²⁷⁻²⁹ NCCPHT. *Request for Proposals - Modernizing the Nation's Public Health Training Delivery System: An Environmental Scan of Online Training Systems*. Washington, DC: 2016.
- ³⁰ Wright K and Miner K. *Adapted Model: Quality Outcomes Based Education, Expanded Dreyfus Workforce Development Levels*, Public Health Workforce E-Learning Quality Standards Framework Project, de Beaumont Foundation 9/15/15.
- ³⁶ Wikipedia. Zone of Proximal Development. Accessed 06/11/16.
- ³⁷ U.S. Department of Health and Human Services, Health Resources and Services Administration and the Centers for Disease Control and Prevention. (2014). *Funding Opportunity Announcement: National Coordinating Center for Public Health Training*. Announcement Number HRSA-14-119.

