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HRH2030
HUMAN RESOURCES FOR HEALTH IN 2030

STATUS, ASSESSMENT AND RECOMMENDATION REPORT ON ADVANCING HUMAN RESOURCES FOR HEALTH THROUGH E-LEARNING

HRH2030: Human Resources for Health in 2030



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Cover photo: USAID's HRH2030/Philippines consulted program managers and implementers from regional, municipal, and provincial levels to identify effective elements of the e-learning platform. Left to right: Nurses from the Autonomous Region of Muslim Mindanao (Credit:HRH2030)

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Introduction

The purpose of this report is to advance the efforts of Human Resources for Health (HRH2030) in the Philippines, with the goals of:

- Improving the skill mix, competency, and distribution of the health workforce at the primary level;
- Strengthening human resources for health leadership, governance, and performance management; and
- Advancing the use of data for human resources for health decision-making at central and regional levels.

The previous work of Philippine Department of Health (DOH) as represented by the technical report of Maria Eufemia Yap, MD, (December 2016) serves as a basis for the recommendations and action steps in this report. The findings of Dr. Yap include a thorough assessment of DOH training activities, participation, and costs in 2013-2015. The report entitled, *Curricular Design and Review for Practice Ready Training for RHUs and BHUs through the DOH Academy*, recounted the problems and needs.

In addition, the Status, Assessment & Recommendations (SAR) Report also draws upon the online training experiences in low- and middle-income countries for health workers (Freyhwot et al,2010; Joynes, 2013). While not conclusive, the findings suggested both opportunities and barriers to implementing technology-assisted learning in resource-constrained settings.

This SAR Report offers an assessment of strengths, weaknesses, threats and opportunities specific to one of Dr. Yap's general recommendations: Technology-assisted learning (e-Learning) for continuing professional development (CPD) and in-service training (IST). The scope is limited to reflect HRH2030 priorities involving physicians, nurses, midwives, and medical technologists (learners). Tuberculosis (TB), maternal and child health (MCH) and family planning (FP) are priority areas for health care quality improvements.

The recommendations contained in this report provide specific activities, action steps, and benchmarks to implement and measure a widespread effort to build, pilot, and scale up a coordinated, integrated, interprofessional e-training. The rigor, integration, and efficiency noted by Dr. Yap are represented here in the approach section.

Section I. Status

This section of the report identifies strengths and weaknesses that impact health systems and present challenges in preparing a capable health workforce. Documents that complement this report include: two (2) site visit reports, the year 2 workplan outline, and the concept paper on e-Learning prepared by the consultant.

The Philippines Department of Health (DOH) bears responsibility for overseeing the quality of training for health workers on a wide array of health problems and treatments for 120 million citizens. This responsibility is immense, and the following report does not underestimate this burden. Local governments, international nongovernmental organizations (NGOs), professional associations, academic institutions, and the private sector contribute to continued development of practicing health workers in the Philippines after pre-service training. Even so, the responsibility for the structure of health systems and quality standards for care reside with DOH.

Recent modernization policies in the Philippines have fueled the exploration of e-Learning as an approach to prepare a health workforce fit-for-practice and fit-for-purpose. This report addresses scale-up as well as sustainability of e-Learning.

Even though current IST/CPD efforts in TB/MCH-FP are based on sound clinical guidelines, little evidence supports the connection between site-based training and improved quality of care. CPD is the commitment of health professionals and the DOH to continuously stay abreast of changes that impact the health of the Philippine people. The link between CPD online training and local quality indicators is possible with available health and educational technologies.

Strengths

Numerous resources provide strength to the e-Learning transformation, including:

Philippine disease/medical specialists. Committed subject matter experts have prepared evidence-based curricula and kept the training current with international clinical guidelines, particularly on the topics of TB, MCH and FP. Academic, government, professional associations, and international NGOs have initiated efforts to transition TB, FP and MCH content to an e-Learning format. Subject matter knowledge is a key strength in the DOH transition to e-Learning.

Policy advances. The DOH Human Resources Development Bureau's (HHRDB) recent policies and administrative orders support continuing professional development for licensed health professionals in-country. Three policies open the door to the integration of e-Learning to support HRH capacity building. Current policies include 1.) The DOH Academy (A.O. No.2015-0042) Guidelines for the Establishment of The DOH Academy). 2.) Continuing Professional Development (Continuing Professional Development Act of 2016 IRR of R.A. No. 10912); and 3.) Free Wi-Fi in Public Buildings. Many underserved areas are slow to receive free internet access in public areas, although this policy is now in effect. A fourth policy statement by the Philippine Commission on Higher Education (2012) sets out criteria for outcomes-based health professional education, a key factor in effectiveness. The Executive Order on Learning and Development Interventions (E.O.366) encourages responsiveness of training to the dynamic needs of pre-service health workers.

Health systems. Vertical and horizontal fragmentation of the health care service delivery has led to DOH plans for system reform. Integration of health care delivery will connect to Service Delivery

Networks (SDN) and will provide improved care coordination for patients in the service area. Training roles (national, regional, provincial, and local) are expected to shift during this transition.

Isolated areas. Training of any kind, and particularly blended and e-Learning, present challenges for Rural Health Units (RHU) health workers and geographically isolated and depressed areas (GIDA). Policymakers, educators, and others are cognizant and attentive to the special needs of health workers in isolated, rural, mountainous and islands service areas. Discussion of e-Learning is accompanied by concerns of GIDA health providers and suggested action steps to bridge identified gaps.

Volunteer leadership. Professional associations provide volunteer leadership in CPD through the Professional Regulation Commission (PRC). Many nurses, midwife, physicians, and medical technician societies have a role in quality assurance for CPD through their representation on PRC Boards. These highly organized networks of experienced practitioners are key stakeholders and potential mentors in the future of enhanced systems for supportive supervision. Discussion of e-Learning and CPD accreditation standards involves professional associations and university leaders. However, leading organizations have independent “streams” of CPD activities which can contribute to fragmentation rather than integration of e-Learning and CPD.

Internet technologies. Health providers are familiar with technology, particularly mobile devices. The Filipino people spend an average of 3.2 hours per day on social media (Rappler, 2018). Fifty-five percent of internet users gain access through mobile broadband. Yet this must be viewed with caution: only 10% of the population has home broadband. Ninety-five percent of those accessing the internet use pre-paid plans and 80% of subscribers are limited in internet speed (Rappler, 2018). While e-Learning can be accessed through mobile technologies, reliable Internet access is not available to everyone, anytime and anywhere.

Academic infrastructure. Many colleges and universities deliver computer science, information technology, and computer engineering degree programs. Academic institutions such as University of the Philippines School of Nursing also offer online and blended pre-service training. The Open University is a historic leader in distance education of academic programs and the Philippine Department of Health has engaged academia’s help for the DOH Academy effort. The academic infrastructure in the Philippines is a key resource in building the long-term capacity for e-Learning.

Weaknesses

Challenges also threaten e-Learning development, testing, deployment, expansion and dissemination.

One-size-fits-all. “Over training” is a wide-spread problem that causes learner-fatigue. The training curriculum, while comprehensive, does not adequately differentiate between previous training, level of practice experience, or cadre. The result is redundancy. To ensure an up-to-date, fully trained workforce, personnel attend many days of face-to-face trainings repeatedly. Tracking longitudinal data for 100,000+ health workers and their successful completion is quite complex.

Over training is worsened by the practice of relying on attendance rather than achievement to signal completion. Monitoring successful completion, such as achievement of specific skills and competencies during face-to-face trainings can be time consuming and difficult to substantiate. In particular, successful completion of supportive supervision is an unfunded service volunteered by mentors. Attainment of demonstrable competencies and skills are the gold standard for continuing education in health care (Moore, 2009). The challenge of improving quality of care according to international standards is

paralleled by the challenge of improving the knowledge, skills, and abilities of the health care workforce throughout the Philippines.

Absenteeism. Participation in face-to-face training involves travel from rural health units (RHU) for between 5-11 days to complete a full course of training. Often the RHU discontinues services to patients while health workers are absent. Overtraining is only one of the causes of absenteeism.

Incomplete clinical training. Lengthy training does not necessarily produce providers of care in RHU. Many trainees do not finish the hands-on portion of the training due to critical shortages of coaches and mentors needed to provide structured supportive supervision. This mentor shortage “backs up” the pipeline of clinical providers qualified to deliver specific services such as post-partum IUD insertion. The number of health workers with incomplete clinical training has not been documented, but anecdotal reports suggest the shortage impacts RHU’s disproportionately.

Many of the trainers in the Philippines Training of Trainers (ToT) network are not qualified clinicians. The TOT model lacks the clinical competencies and skills of mentors. The role of trainers in the current model does not provide for supportive supervision.

Government turnover. Frequent turnover in local government and DOH leadership are followed by changes in policy and health priorities. Lack of continuity may have contributed to the delay in implementation of the DOH Academy and the CPD program certification.

The recent devolution of health services in the Philippines has left the local government responsible for the provision of a range of health services. Some localities are ill prepared for this responsibility. In addition, this situation is aggravated by the frequent transition of political leaders and the shifting politics of health care on the local level. Funds for travel and training may be restricted as health priorities change, leaving urgent national health priorities, such as tuberculosis and transmittable diseases, without resources. GIDA health workers are disproportionately impacted by these resource challenges.

Workforce data. To accurately assess the needs and effectiveness of the health workforce, gaps must be identified and addressed. Timely data does not appear to be available to make decisions about health workers’ qualifications by geographic location and public health topics. The Philippine DOH Information Systems Strategic Plan (2018-2020) articulates the challenges in developing, maintaining and coordinating meaningful health workforce data. The data collected in the provision of e-Learning can supplement and support DOH and USAID HRH2030 efforts to strengthen workforce decision making.

Section 2. Assessment

This section of the report identifies e-Learning opportunities to support HRH workforce preparation and anticipates preventable threats.

Opportunities

The DOH Academy, with the guidance of the HHRDB and HRH 2030 team, has the potential to establish a direction for e-Learning with the following:

Raise awareness of e-Learning among opinion leaders and stakeholders. Many stakeholders have established negative perceptions of e-Learning based on webinars or academic courses. Both webinars and semester long courses are outdated models that do not represent intensive audiovisual, micro-segmented, practice-based learning. Regardless of the reason for resistance to a new model of training, the DOH Academy has the opportunity to raise awareness among stakeholders and opinion leaders. E-Learning demonstrations can capture the attention of trainers and health practitioners.

Streamline and simplify access. During the pilot phase, the DOH Academy has an opportunity to funnel health worker training into a single point of access. As an approved CPD provider, the DOH Academy portal can serve inter-professional training needs to address the nation's top health priorities.

Support PRC standards and process development. To respond to immediate and emerging CPD needs, action is required by PRC. According to the Continuing Professional Development Act of 2016 IRR of R.A. No. 10912, licensure renewal for the estimated 100,000 Philippine physicians, nurses, midwives, and medical technician calls for ten CPD units bi-annually for each person. This policy specifying approval and tracking of continued professional units presents an opportunity to capture efficiencies in the CPD approval processes. HHRDB has the authority to delegate program review approval, and CPD authority to qualifying organizations, such as the DOH Academy. Other applications for this delegated authority were pending at the time of this report. The second opportunity is to remove redundancies in the approval process by instituting an interprofessional CPD approval process where physician, nurse, midwife, and medical technician CPD approvals could be processed with a single application. The third opportunity is to aid DOH in articulating standards, such as outcome-based learning that reinforces a professional development system free from commercial interest.

Mechanisms for online coaching and mentoring on the portal can supplement face-to-face supportive supervision. Online rubrics have the advantage of supporting the mentor's role in preparing/delivering learner feedback and evaluating their clinical performance while also verifying completion.

DOH Academy identity. The DOH Academy has an opportunity to create an identity by refreshing the portal and designing the e-Learning classroom. Standardized module design templates can emphasize the integration of training content. This is especially important for a virtual center. A portal description is attached to this report.

Data, evaluation and analytics. During the design and development phase, there is an opportunity for portal data to seamlessly interface with the HRIS. Such integration of data can be automated and simplified with electronic reporting. (McGill et al., 2014; Zaghab & Noel, 2016).

Social networking needs of health workers. Trainers, health workers and managers recognize the social benefit that face-to-face training provides. Travel, time away from the clinic and social interaction with

peers offer share experiences and exposure to best practices. In the transition to e-Learning, some health workers may experience a social loss. An evaluation of the perceived social loss can serve as input into how social media can address the needs for social support and peer mentoring.

Learner motivation. As the DOH Academy charts out an educational strategy, it is wise to consider factors that motivate learners to enroll and complete online CPD. Gaming strategies, such as auditory and visual reinforcements, along badges and certificates provide small incentives for success.

The e-Learning approach can better meet the needs of health practitioners. Classroom can focus learner attention by breaking modules into ten to 12 minute audiovisual clips, called micro-segments. Research has shown micro-segments and other active learning strategies to capture and retain learner attention (Zaghab et al, 2017). Formative learning, such as case studies patient videos, relevant problem solving and practice scenarios, encourage practitioners to apply new knowledge in real-world challenges.

Threats

Four key risks could detour or delay the implementation and scale-up of the DOH Academy portal and e-Learning platform.

Stakeholders. Proper orientation and preparation of subject matter experts, technology staff, and opinion leaders can build a base of support for the e-Learning approach. When properly prepared and supported, subject matter experts can contribute as module owners. Technology staff ensure smooth operations. Opinion leader can become advocates. However, retooling the existing network of trainers may be of primary importance to early adoption of e-Learning. Failure to solicit stakeholder feedback can destroy trust and delay activities.

Complexity. Complexity of any new technology innovation discourages adoption, retention, and subsequently widespread dissemination (Rogers, 1995). Usability is the interface between the learner and the technology (Dumas & Redish, 1999). For this reason, usability is a key factor in the success of the e-Learning portal and platform. It can be defined as learner and module owner comfort, satisfaction, and perceptions of the usefulness of e-Learning. The activities in the following section aim to eliminate complexity for the learner. Unnecessary e-Learning functions can reduce classroom distractions and focus learners. For example, a single login to the portal streamlines the enrollment process. The same portal retains learner badges and credentials.

Customer connection. With help, new learners can overcome any barriers to online login, enrollment, participation, and successful completion. A prepared customer service connection can answer questions about module offerings, instructional hours, and CPD credit processing. They may forget their password or forget the URL. No question is too small to help a learner make the transition to e-Learning. Perhaps they forgot the password. Any unanswered question may be a reason for the learner fail to register or complete the program. The inability to offer customer service during the transition would be detrimental to the initiative.

Unanticipated expenses. Some costs of Open Source or low-cost e-Learning platforms may be hidden. In the planning and selection process, the true cost of each platform can be calculated and budgeted accordingly. Unanticipated resource requirements could immobilize the system resulting in work stoppages, site malfunctions, broken links, and learner dissatisfaction.

Section 3. Recommendations

This section outlines recommended activities for 12-month period beginning October 1, 2018 and as detailed in the timeline section of this report. The P6 Initiative is comprised of six elements: People, the Portal, Programs, Policy, Partnerships, and Project Infrastructure. The following outcomes are anticipated with full implementation of this initiative:

- A highly visibly, accessible, virtual portal serving the online training and continuing professional development needs of physicians, nurses, midwives, and medical technologists. The DOH Academy website is envisioned as a single point of entry for health professionals. (Portal)
- Electronic infrastructure to host and deliver e-Learning, e-Learning Lending Spaces, and tablets. (Project Infrastructure)
- A tablet prototype for learners in GIDA areas. Modules with up to 90% of the material off line would ensure their access to audiovisual segments in a secure environment. or GIDA learners could be available with up to 90% of the material off-line. Reused audiovisual segments could offer health workers the same experience. In this manner the protocols to load and secure modules on a tablet for lending, services as both a program and new training infrastructure. (Programs and Project Infrastructure)
- TB 101 and FPCBT1 modules can be transformed from a traditional training format to a digital e-Learning format for registration through the DOH Academy portal and delivery of modules online. These online offerings can be based on differential learning levels involving a combination of factors which may include each learner's cadre, role, and service setting. Modules were made of reusable audiovisual micro-segments based on existing content. CMSS content can be integrated into subject matter content as advised. "just-in-time" training requirements can be used to address urgent or emergent health problems without redundancy or overlap. (Programs)
- Efficiency will be gained in CPD/PRC accreditation and approval processes. (Policy)
- A bank of processes, guidelines, templates and tools can be available to module-owners, educational technologists, and administrators as they scale-up programs. (Processes)
- Data, analytics and reporting capabilities can inform decision-making. Learner satisfaction, module effectiveness, learner demographics, learner performance and achievement can serve as metrics for this activity. Successful CPD completion can produce not only personal certificates for learners, but can also generate completion data in required fields for upload to the PRC boards for CPD processing. Rules to govern management and data sharing can be prepared. (Policy)
- Discuss the adaptation of competency rubrics for CMSS in clinical care using e-Learning capabilities. (Programs)
- Growth in the capacity for educational technology support, including customer service support, in universities, government units and private sector. (Partnerships)

Framework for Action

Establish a learner-centric portal. A portal is proposed as a unified virtual location where the DOH Academy can host and track e-Learning in TB, MCH-FP and CMSS content areas for physicians, nurses, midwives, and medical technicians. The HRH2030 team can plan, design, and establish a unified DOH Academy portal with database login, data analytics, registration functions and customer service.

To contribute to objective 2 the following activities can be undertaken:

- Secure the URL for branding a highly visible website. Identify essential functions and usability metrics for the website. Secure the site.

- Design, code and evaluate the usability of the site. Procure software for website design (graphics) and maintenance. Establish protocols for site maintenance and backup.
- Create a secure single sign on.
- Negotiate roles with DOH and KMITIS. Identify requirements and procure a local SME web developer. Detail requirement and procure a database development SME.
- Ensure integration of the database with the website. Set rules for administrative access to the portal and the database.
- Establish a process for governance, decision-making, and information sharing regarding the portal and e-Learning data.
- Organize and graphically prepare an integrated portal with designated health worker categories and/or cadre, and/or by delivery mode, and/or by training content areas.
- Create web pages to include module descriptions, CPD units, learner outcomes, instructor and host organization disclosures in a standardized format.
- Identify and enable learner selection by cadre, and location. Coordinate data fields and uploads through Knowledge Management and Information Technology Service (KMITIS) and HHRDB. This activity shall be planned and coordinated well with HRH2030 Objective 3. Plan data fields from logins (learner data) and design the longitudinal tracking system. Build and test the login and database system.
- Plan reporting format and schedules in coordination with CPD providers. Establish protocols for back up and password assistance. Create and continuously update the customer service log.
- Disseminate a brief description of the branded portal suitable for publication by communicating with DOH units, PRC units, professional associations, and health organizations in the pilot regions.
- HRH2030 will participate in quarterly meetings with DOH, HHRDB, LDD Bureau, USAID, DOH regional health office representatives, and implementing partners (ReachHealth and TB Platform) to achieve the aims of the project.
- Create automatic reports for learners related to history of enrollment and successful completion. Code registration sequences for “just-in-time” module enrollment.
- Once the e-Learning system is procured, create an online classroom, modules, and registration page with necessary micro-segments relevant to each health worker cadre.
- Identify and recruit trainees.
- After six months of activity prepare a report to stakeholders based on aggregate learner data, Google analytics, the customer service log, and identify areas for improvement. This includes reporting back on key results areas: DOH Academy enhancement.
- Open e-Learning Lending Space and classroom space in the HRH2030 office can be explored to find the best-fit for learners and rural health units (RHUs). Cross-training of instructional technology personnel can be conducted in this location. Materials and equipment, such as authoring software and technology editing equipment will be located on site.

Select, install, and steward the DOH Academy e-Learning Platform. Secure and implement a student-centric e-Learning cloud-based system resulting in the creation and pilot delivery of TB, MCH-FP, and CMSS micro-segments, modules, and classrooms for learners from the population of focus, including a portion of whom serve in GIDA areas.

Steps associated with his activity include:

- Secure technical expertise for rapid implementation.
- Identify vendor customization and technical support during start up.
- Define anticipated outcomes of the training transformation to significantly reduce absenteeism in two ways: 1) mapping the TB and MCH/FP curriculum for evidence-based, practice oriented

online modules and certificate programs. Travel to week-long sessions would be reduced. Modules are a maximum of 60 minutes and can be completed 100% online for internet-capable settings; and 2) Just-in-Time approach actively “pushes” specific training modules to learners based on their role, the setting in which they practice, and the requirements established for accreditation.

- Translate classroom design, functionality and structure into a prototype tablet. The segments comprising the selected module content would be transferable to the e-Learning Tablet initiative.
- Complete the design, implement the plan and link the e-Learning platform to the portal.
- The HRH2030 technical assistance to HHRDB’s performance management system could be in place to utilize eLearning in CMSS. Supervisory training could be digitized and competencies could be assessed.
- Customize the e-Learning classroom to reflect the DOH Academy brand.
- Plan and program templates, tools, tests, and structures for use in the e-Learning platform with special attention to learn-centric approach.
- Work with KMITS to ensure security of the e-Learning transactions and related data.
- Discuss plan for broader dissemination of TB and MCH/FP modules to learners in the target regions.
- Cross-train personnel in the creation of classrooms and registration systems in the classroom. Institute and build the internal capacity to include practice experiences, cases, problem solving, sound, visuals and gaming features to stimulate interest and promote learner completion.
- Discuss the needs and outline a model rubric for online supportive supervision in coordination with ReachHealth and existing DOH training This includes auto-grading and personalized feedback and structured guidance for both learner and clinical mentor. Successful completion would be designed to ensure the learner’s clinical skills are verified in the target subject areas according to established standards.
- Generate the first of a multi-year plan to code, and fully implement the use of the supportive supervision rubric in the target region.
- Evaluate the usability of the rubric with stakeholder input (Dumas & Redish, 1999).
- Discuss and draft multi-year dissemination plans to reach clinical mentors through established structures, including DOH Academy outreach, retooled trainers, and other DOH units. Dissemination plans would be designed and employed as a component of the HRH2030 performance management toolkit.

Build and Deliver e-Learning. By month nine of the initiative, pilot four one-hour multi-media modules (TB, MCH-/FP, CMSS) comprised of up to 24 micro-segments. The aim is to make plans to integrate CMSS modules into the content series, as well as to reach licensed health workers in three regions (physicians, nurses, midwives, and medical technicians).

The steps associated with this activity include:

- Secure technical expertise for rapid start-up and engage local workforce.
- Generate a hierarchy, taxonomy and development plan for existing TB, MCH-FP, health worker training curricula into module-based digital learning micro-segments with integration of new or existing CMSS content modules. Collaborate with module owners.
- Articulate module and series learning outcomes for each module. Generate formative and evaluative learner assessments that match these outcomes.
- Prepare micro-segments for each of the initial modules, including course information, audiovisuals, content delivery, learning tools and resources, case studies, testimonials, formative learning activities, and learning assessments.

- Produce micro-segments.
- Plan modules and progressively more advanced e-Learning offerings for physicians, nurses, midwives and medical technicians.
- Utilize a storyboard process to test usability and learner-centricity of modules.
- Generate a one year and multi-year development calendar.
- Use the module development sessions for training. Utilize the series development process as a hands-on learning experience for instructional development personnel.
- Translate online micro-segments into tablet-ready pilot e-Learning modules.
- Prepare content experts as module owners. Provide ongoing support, templates and tools.
- Reinforce and shape modules for outcome-based assessment. Articulate roles and responsibilities.
- Establish processes for collaboration between the instructional design and content team.
- Generate protocols, tools and templates for standardization and rapid scale up of modules.
- Integrate the modules and series offerings according to cadre needs on the e-Learning platform.

Launch e-Learning Modules. Open training registration for three content areas on the portal for online sessions convened by DOH for the purpose of accredited CPD Programs under the Continuing Professional Development Act of 2016 IRR of R.A. No. 10912.

The steps associated with this activity include:

- Plan and build a classroom registration and test/quiz capabilities for CPD certified training program for TB, MCH-FP, and CMSS for target health worker cadres. Organize and share registration information, and successful completion for each live training with relevant bodies.
- Train personnel in the creation and reporting of standardized module/course evaluations.
- Create back-up protocols for registration system, modules and evaluation systems.
- Track CPD successful completion of TB, MCH-FP, and CMSS training for licensed physicians, nurses, midwives and medical technicians.

Blended e-Learning Pilot. To meet the needs of health workers in geographically isolated and disadvantaged areas (GIDA) blended e-Learning technology is recommended. The pilot provides the same highly visual materials in micro-segment format via a pre-loaded tablet, or a tablet option that provides the “best fit” for learners and RHUs. For example, a single module or a series with many segments can be locked and loaded onto a tablet for that purpose. The tablet is not connected to the internet. The learner’s registration in the course or series is a three-minute process that can take place on the DOH Academy portal through any internet connection. Recommendations may include the use of existing Learning Spaces (hubs) at either regional training centers or SDNs. RHU/GIDA learners could register on the portal and enroll in a module while at the Learning Space and could check out a tablet in an honor-based lending library. Tablets could be loaded much like an audiovisual library book. No internet is required for experiencing the audiovisual modules on the tablet. Loaded content could cover up to 90% of the module. Upon returning the tablet to the Learning Space, the learner could use their personal login to access and successfully complete a standardized online assessment and a course evaluation. The modules on the tablet would follow the sequence offered on the e-Learning Platform.

Strengthen CPD/PRC accreditation. Shape HHRDB CPD/PRC procedures and practices to identify areas for standardization, interprofessional approvals, and application of the outcome-based assessment framework set forth in the COM 46-2012 of the Philippines Commission on Higher Education using portal registration (and reporting) features.

The steps associated with this activity include:

- Offer information international comparisons in the accreditation of interprofessional CPD.
- Inventory the electronic systems for the CPD/PRC application processes.
- Gather information on PRC boards electronic and paper processes to conduct a desk audit. Assess volume, steps in the approval process, and instructions to applicants.
- Prepare an example of integrated outcome-based modules and learner assessments into CPD program approval requirements for TB, MCH-FP, and CMSS (for physicians, nurses, midwives, and medical technologists). Use modules as model program applications.
- Develop models for discussion of e-Learning series integrating career progression and specializations for TB, MCH-FP and CMSS content areas.
- Utilize learner data from successful completion of TB, MCH-FP, and CMSS CPD modules to evaluate and continuously improve the instructional design and delivery through standardized course evaluations.
- Offer and support the dissemination of standardized course evaluations in TB, MCH-FP and CMSS courses while stimulating discussion of integrated evaluation processes into the CPD requirements and report to the Professional Development Boards.

Workforce preparation. HRH2030 can build the capacity of local instructional technology workforce for sustainability. This includes: cross-training local workforce from training centers, provincial health offices, Learning Spaces, and at HRH2030 headquarters for: instructional technology equipment, audiovisual production, website security, database reporting, module generation, learner assessment software (as needed), and SCORM file creation (authoring software). While technical experts can be assigned to the project immediately to begin the technical work of preparing the website for launch, producing modules and linking the platform to the portal, the knowledge transfer will begin in quarter 3 and 4. Personnel from within and outside of the DOH Academy can be selected to gain new skills or expand upon their existing expertise in instructional technology. Knowledge transfer must accompany the technology transfer.

The steps associated with this activity include:

- Transfer technology from Subject Matter Experts (SMEs) and industry representatives to a sustainable local workforce through a process of modeling, hands-on experiences, standardization, and post-implementation support.
- Identify cross-training needs.
- Reach out and select SMEs and trainees for each position.
- Prepare brief video training module. Identify tasks and deadlines for each.
- Build experiences through the DOH Academy e-Learning portal and structured live activities.
- Initiate a discussion of "super user" pathways for target regions. Define competencies and related KSA for instructional development and technology personnel.
- Summarize the discussion of factors that foster or inhibit progression of individuals through the training. Develop badges and online recognition for e-Learning.
- Outline and initiate discussion of an internship program including student requirements, hands-on training experiences, and rubric for evaluation educational technology. Draft announcement.
- Assess college and university experience with multi-media, CPD, online education, and e-Learning technologies.
- Propose and provide templates to activate and formalize university/college partnerships. Engage regional and provincial partners.

Secure Subject Matter Expertise. Conduct an assessment of the ongoing human resource KSA requirements in educational technology and module development. Match these needs with stakeholder groups and local college or university educational programs through formal partnerships.

Steps associated with his activity in year 2 include:

- Through professional association, universities, and international NGOs, identify and prepare subject matter experts as “module owners”.
- Define roles and responsibilities of STTAs, module owners, DOH Academy staff, and local instructional technology trainees. Discuss with stakeholders.
- Provide orientation and support experiences for module owners to participate in module development based on the new approach to e-Learning, including modular, micro-segment material in multi-media format with authentic practice applications.
- Create a brief video on the platform to prepare “module owners” to apply outcome-based learning in modules shaped for interprofessional and cadre-specific content through their career progression
- Identify talent pools in target areas and align with colleges in the target region.
- Create templates for university and for module owner agreements such as digital rights, photo permissions, copyright and disclosures.

Evaluation and continuous improvement. The SAR recommends collection and aggregation of data electronically from the portal, learner modules, and administrator levels to ensure the optimal usability of the site, and the achievement of learning outcomes (Zaghab & Noel, 2015; Zaghab et al, 2016). Accountability relies on automated systems for reporting and objective evaluation. Analytics provide information for continuous improvement to strengthen the pilot program. This ensures that only effective programs are disseminated and scaled-up.

Steps associated with his activity include:

- The sources of data available in an electronic format could include: Google website analytics; standardized module activity evaluation; learner login data; module/series registration and completion results; and the customer service log.
- Learner usability feedback could be gathered as opportunities become available.
- Aggregate data no less than quarterly with a brief analysis-report after six months of operation.
- Identify areas for continuous improvement.
- Standardize electronic report formats between the portal and the HRIS database and CPD.

Section 4. Timeline

With approval of the year 2 workplan, the timeline for HRH2030 e-Learning implementation is summarized as follows:

- The portal infrastructure and design will be completed in quarter one.
- The digital development of two online content modules will be completed in quarter two and uploaded into the e-Learning platform in quarter 3. Collaboration with module owners continues.
- The portal and e-Learning platform will be linked no later than the end of quarter 3.
- Registration pages will be created and tested no later than the end of quarter 3.
- Data alignment between the DOH Academy Portal and PRC boards could be tested in quarter 3, if preliminary mapping is completed prior.
- Learners will be recruited and enrolled in quarter 4 drawing on an outreach plan from quarter 3.
- Procedures and templates will be refined in quarters 2 and 3. They will be used in training and support during quarters 3 and 4.
- Partnerships will be extended into quarters three and four.
- A new generation of e-Learning technical experts could be encouraged throughout the program, but primary in quarters 3 and 4.
- The first evaluation data will be available during quarter 4. Areas for continuous improvement will be identified.

Section 5. Scalability and Sustainability

What appears to be a simple transition of a traditional ToT health worker training model to a national distance education model, involves transformation of the professional development sector. The people, the programs and structure are all impacted by shifts in attitudes, behaviors, and organizational processes. The recommended action steps may have far-reaching impact, including innovations in teaching methodology, well-defined expectations of learners, and the connection between quality training and quality of care.

Stakeholder involvement is essential to the success of the transformation. Formal and informal engagement of opinion leaders and administrators could spark collaboration and partnerships, in the entire cycle from ideation to evaluation.

To be transformational, the e-Learning model must be both scalable and sustainable. The DOH Academy plans to procure an e-Learning platform. The local workforce can be trained as module owners, customer service support, and instructional technology personnel. Expansion is possible with the effective use of local technical resources and the wide-spread use of protocols, process standardization and other transferrable templates.

Technical assistance by HRH2030 to the DOH Academy is a critical component in the rapid scale-up and capacity building. The World Health Organization (WHO) defines transformative scale-up of training as, “the sustainable expansion and reform of health professional education and training to increase the quantity, quality and relevance of health professionals, and in so doing strengthen the country health systems and improve population health outcomes.”

e-Learning sustainability is the “...proven potential to be adopted and expanded beyond the original development environment. Critical factors in the sustenance of technology-assisted instruction are: institutional resources, developer and user technical guidance, instructor commitment, learner motivations, and technology (stable, mature, secure, and regularly updated).” (Gunn & Hollingsorth, 2014). These results are echoed by a systematic review of 64 articles presented by McGill and colleagues. Guidance to the project by HRH2030 could support the pilot implementation in resource-constrained settings, the engagement of Learning Spaces, and the dissemination of the innovation through existing training networks.

Sustainability is not equivalent to financially self-supporting. The DOH Academy e-Learning platform anticipates scale-up to serve over 100,000 learners. Online modules can replace weeks of traditional on-site training. An examination of return on investment answers the questions, “What is the return” but also “Who benefits from that return?” The beneficiaries of e-Learning are likely to be the local government units who save travel money and in reduced absenteeism. Health costs could be reduced overall with health workers more likely to detect and appropriately treat TB or address post-partum maternal needs. However, the dissemination of refined practice skills serves the public health needs, the intangible social good. E-Learning could be useful in rapid dissemination of standardized quality care approaches to address urgent public health needs.

While the discussion has not concluded about private health providers payment for e-Learning and other training, it is important to note that the workforce between public sector and private health providers is not only fluid, it is overlapping. Health workers transition between both employers as salaries, contract status, and political priorities evolve.

In short, the DOH e-Learning platform and related services has no evident source of direct support other than the 3% allocation for the DOH Academy's training mandate.

The DOH Academy e-Learning platform has some resources to be dedicated toward financially self-sufficiency during the pilot phase. However, expenses related to operating scaled up CPD program will increase as the goals are achieved. Broad dissemination of e-Learning, greater adoption of e-Learning by learners, and increasing the number of quality CPD programs online, would increase demands on technology, on customer support, and on module maintenance. Costs of operation would rise as the demand increases.

A new value proposition for the DOH Academy could look to the health care training data to be captured and could associate this data to indicators for the quality of patient care.

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Attachment B. Proposed Portal Description

The proposed DOH Academy portal could be the publicly facing doorway for health workers to access required health training. The proposed portal should answer learner questions and provide a menu of options about available CPD training. Health workers could:

- Read and/or view a video including a brief description of the site
- Browse training offerings by cadre and by subject
- Identify which training is right for them based on module descriptions
- Create a login
- Register or enroll in modules of interest or modules required by DOH
- Access their training history, badges and certificates
- Find customer support and technical support
- Link to other resources

As the number and depth of training offered on the DOH Academy platform grows, so too would the importance of the portal to health workers from throughout the Philippines in a variety of settings. The first adopters of e-Learning are expected to be leading health organizations (including professional associations and academic institutions), entry level health workers in specific regions targeted by HRH2030's pilot, and health workers who are innovators with access to email and reliable internet.

The first activity will be to create a portal plan. A Filipino technical website consultant is expected to work with the DOH KMITS and website personnel, and HRH2030 experts in online learning websites to generate and link the portal to the e-Learning system. Together, the consultant will prepare a plan that includes the design, site planning, build, domain registration, security, optimization, maintenance, and data extraction and analysis.

Because the DOH Academy will be a health worker's first exposure to the new e-Learning modules for TB and MCH-FP, the plan must also include efforts to promote visibility during the launch and during the first year of operation. One important activity to promote visibility is branding the portal with an easy-to-remember URL or domain name (for example <https://DOHAcademy.gov.ph>). This domain name must be easy to recall so learners can type in the address. This domain must be retained for years to come.

A second activity will be to tag the portal web pages so search engines can find and direct health workers to the portal using a link. While the site hierarchy is planned when the portal is launched, search engine optimization is an ongoing process. Analytical reports are accessible to assess how the DOH Academy portal is doing each day and over time: where the site visitors are coming from, the length of time visitors remain on the site, and the pages visited most.

A third activity is to gain the participation of stakeholders in providing input before the completion and launch of the site. This may include feedback on the design as well as ideas for links to resources and other pages. Links from resource sites to and from the portal will help dissemination and coordination.

A fourth activity is to prepare staff support within the DOH Academy to provide customer service for those with questions about the training and CPD, and technical support from platform outside the DOH to provide trouble shooting, security patches and related communication.

Perhaps the most important activity to promote visits to the portal and subsequent participation in e-Learning, would be an organized system of notification that can be sent to health workers via email. Email addresses for electronic outreach could be secured from valuable stakeholders and the portal,

including: professional nursing, midwife, medical technician, and physician associations; the lists of previous (MCH-FP and TB) training participants; the PRC licensing boards; and the health workers creating logins on the portal.

An email address will be required for the learner to receive certification. The learner login creation process populates a database containing learner data.

Using data from learner login and the module enrollment data the DOH Academy could send “push” email notices out to specific learners based on their profile. Push notification could include emails containing certificates or badges to signify successful completion of one or more modules. When learners partially complete a module, email notices could be sent as encouragement. A unique administrative feature of the proposed portal relates to mandatory training modules for specific health worker cadres. For example: a module containing new diagnostic guidelines for treatment of non-adherent TB patients may be required for physicians and nurses in ambulatory clinics. The DOH Academy can register physicians and nurses from ambulatory settings for the required module using the email address provided by DOH.

Health workers create a login that populates a database containing the following learner data fields. The standardized format for each data field could be mapped in coordination with DOH, experts in the HRH2030 HRIS efforts, and DOH KMITS to provide accountability and reporting. Data could include:

- License number [or alternative]
- Learner first name
- Learner last name
- Email address [Instructions: View a video on how to create an email address on gmail or yahoo.]
- Cadre [pull down menu: Physician, nurse, midwife, medical technician, community health worker, others.]
- Birth year [0000]
- Management Responsibilities [pull down menu]
- Level of reported expertise [optional. pull down menu: basic, intermediate, advanced, and expert]
- Province in which you provide services [pull down menu]
- Location #1 [Barangay where you provide services]
- Location #2 [Barangay where you provide services]
- Name of facility #1 [open text]
- Name of facility #2 [open text]
- Type of facility location #1 [pull down menu]
- Type of facility location #2 [pull down menu]
- How did you hear about the DOH Academy Portal [pull down]
- How were you notified that you were required to complete this training? [pull down]

In addition, when a learner enrolls in a module, or when the learner is assigned a required module, the following data fields will be auto filled:

- Course Number
- Enrollment date
- Completion date
- CPD Units
- PRC Board [by cadre]

This data and analytics will be available for learners by module.

Attachment C. Proposed Anatomy of a Module

The structure of an e-Learning module reflects the educational approach adopted by the DOH Academy under the guidance of HRH2030. This approach to CPD is based on adult continuing education principles (Moore et al 1994; Zaghab et al, 2017) with a focus on measurable practice-based outcomes. Learning outcomes for each module are mapped to competencies and will be assessed through active learning and problem solving as it corresponds to real-world settings. As noted below, one-hour, mobile-responsive modules use audiovisual elements with both formative and evaluative assessments. Auto-grading and feedback to learners is a program feature that allow for rapid scale up to meet the needs of an estimated 100,000 physicians, nurses, midwives, and medical technicians practicing throughout the Philippines.

In year one, in conjunction with valued stakeholders, HRH2030 generated a series of competency maps for each cadre for specific subject areas and responsibilities, as recommended by Objective I. These competencies could be ranked according to career progression: basic, intermediate, advanced, and expert. Learning outcomes for each e-Learning module establish parameters for health workers to achieve the desired competency for his/her cadre. Some e-Learning modules (segments) would be applicable to every cadre, for example: the overview of TB in the Philippines. Other segments would be specialized for the role and setting, for example: the diagnostic criteria for resistant TB (including how to conclusively read lab reports). Perhaps some e-Learning segments may be shared by two cadres, for example: how to counsel patients in post-partum IUD choices (including how to address personal belief systems).

Audio-visual subject matter segments of 10-12 minutes each, are the building blocks that can be packaged and reused into modules. Modules can also be repurposed into a progressively more advanced package called Series (one or more modules with stated learning objectives), or a comprehensive Certificate program (typically involving 15 instructional hours with advanced competency around a targeted practice objective). Subject matter segments are designed to augment the learner's existing knowledge and experience.

Another reusable building block is a micro-segment. Micro-segments are also produced audiovisual clips, but they shorter (an estimated 45 seconds to 5 minutes). Micro-segments serve a variety of purposes in the on-line classroom, such as case studies, contextualization of module for the learner, application of subject matter knowledge to practice, reflection and deep learning, testimonials regarding value to learner, patient case studies, flipped questions, and other practical applications. Micro-segment play an important role in application of subject matter to clinical setting to promote real-world problem solving.

Segments and micro-segments could be put to reuse on a tablet prototype in year two to test a test-case delivery of modules to health workers without reliable internet in geographically isolated and disadvantaged areas. While the tablet pilot for GIDA health workers is planned for internet-free instruction, the module registration and the successful completion of the assessment would require on online connection. AIHA has demonstrated a similar training strategy for health workers in other parts of the world.

The segment description is noted below. Table 1 provides an example of a 60-minute module. Table 2 illustrates the segment id, the sequence of segments and micro-segments for a series (multiple modules in a classroom).

As noted earlier, e-Learning modules are organized around learning outcomes. Each subject matter segment and formative learning micro-segments guides learners toward knowledge and critical thinking to apply knowledge to practice settings. At the end of the module, learner performance is assessed and documented. Successful completion typically requires a 70% or higher passing rate. Learners receive an online printable certificate, badges, and retain an online record of CPD accomplishments on the portal. In year two, the DOH Academy portal and platform could provide downloads with the required data fields and test the transmission of batches to the PRC board on a regular basis for CPD approvals.

The outline below illustrates the essential components of a one-hour e-Learning module. Each component represents a building block that is produced into audiovisual format. The process used for the training module development is based on the commonly accepted ADDIE process for online training development. ADDIE stands for Analyze + Design + Development + Implementation + Evaluation.

1. **Context.** This micro-segment puts this module into the context of other knowledge that may be required, both past and present. Often times a testimonial statement by an individual will share how the module connects to each learner’s practical experiences (for that cadre) and notes how the module will augment their practice. In brief, how they apply the knowledge they gain from this module will help motivate the learner to become a better physician, nurse, midwife, or medical technician.

2. **Learner expectations.** This micro-segment provides the learner with information about the length of the module, the components parts in the module, and how to contact help. This acquaints the learner with the requirements for successful completion. The learning outcomes are clearly articulated. If the module is one building block in a Series or Certificate, that information is transmitted here.

3. **Reflection.** Reflection exercises are often called a “flipped classroom”. The module begins with a thoughtful question to be answered by completing the learning experiences in the module. Questions or reflections ask the learner to seek the answer during the hour-long learning experience. The learner is asked to type in an answer to the question prior to the first subject matter module.

A straight-forward example might be, “Reflect on a day in your clinic last week. Now, think of a patient with a family member present. How did you acknowledge the family member? Was the family member a help or a burden? How could you family member help your patient’s medication adherence goals?”

4.

Active learning. Active learning is also called “formative learning” or practice-based learning. Required, but ungraded hands-on exercises encourage learners to applying the content gained through problem solving. These structured exercises are 100% online such as an example situation or scenario that requires an answers or responses from the learner. Answers and discussion are provided automatically to keep learners motivated and focused on completion.

5.

Content segments. Segments are not pedantic lectures. They transmit content with graphics, voice-over, some slides, illustrations, but this is not the traditional lecture. A hierarchy is established to place the subject matter in context. Content is concise and to the point. The terminology is defined (and may include a glossary) and language is used consistently throughout the module. Subject matter may cover policy, practice standards, diagnostic criteria, and patient management, etc. Resources are included in the classroom toolbox. Thus, the segments discuss and summarize the guidelines in an organized, relevant fashion but do not read official

6.

Procedural application. Once the evidence and subject matter segments have been completed, the learner applies this knowledge to completion of forms, and local and national protocols. The completion of a form or adherence to a step-by-step protocol represents the application of the subject matter evidence. A similar technique can be used for skill building and problem solving. A toolbox in the classroom uses immediately accessible resources. No outside links are used.

7.

Case studies. Case studies are another form of application and problem solving in the e-Learning classroom. A (sample) patient case video can be supplemented with medical notes about the last visit, test results, and a list of current medications. Learners will be required to identify the issues and the best patient management or treatment strategy, depending on the cadres. Cases are also a great way to bring a management scenario to life. Medical technicians can be tested with a laboratory scenario on risk management or equipment integrity. Clinical and CMIS case studies may include multiple case study segments. Certificate program to provide progressively more advanced hands-on experiences with one or more case studies. Automated responses reinforce the learner’s decisions and raise unanswered questions. In a complex case study, there may be a series of questions as well as supplemental information or classroom tools (such as international diagnosis and treatment protocols) to guide the learner.

8.

Assessment. To complete the module, a graded assessment is required. Typically, a total of 10 questions are randomly generated from a database of questions. Learners can take the test up to three times and must correctly answer seven or more. Auto-grading provides learners with the correct answers and the evidence behind the answer. One graded assessment (4-10 minutes in length) is estimated for each instructional hour.

9.

e-Evaluation. Every module, series, or certificate includes the learner-reported evaluation of the module. Evaluation feedback supplies valuable information for continuous improvement of the modules. It identifies any technical issues and assesses the usability of the online classroom for the learner. Open-ended anonymous responses are also invited. Data are collected outside of the e-Learning platform and the identity of the learners will not be shared with the instructors or supervisors. Data will be analyzed in aggregate.

10.

Toolbox. Each classroom has an online Toolbox with a glossary of new terms, forms, guidelines, summary pages, and other materials. The purpose of the toolbox is to keep learners' attention in the classroom rather than sending them to external links.

Table 1. Timestamp of e-Learning Module (example) for 60 instructional minutes

Segment id	Sequence	Segment/Micro-segment Purpose	Instructional Minutes
1	1	Learner expectations	3-4 minutes
2	2	Context	2 minutes
3	3	Reflection	1 minute
5	4	Knowledge Segment	9 minutes
6	5	Procedural application	7 minutes
5	6	Knowledge Segment	10 minutes
4	7	Active Learning	3 minutes
5	8	Knowledge Segment	10 minutes
7	9	Case Study	4 minutes
8	10	Assessment	6 minutes
9	11	e-Evaluation	4 minutes
		Total Instructional Time	60 minutes
10		Toolbox of Resources	0

Table 2. Timestamp of e-Learning Series (example) for 180 instructional minutes			
Segment id	Sequence	Segment/Micro-segment Purpose	Instructional Minutes
1	1	Learner expectations	4 minutes
2	2	Context	3 minutes
3	3	Reflection	2 minutes
5	4	Knowledge Segment	10 minutes
4	5	Active Learning	6 minutes
5	6	Knowledge Segment	12 minutes
4	7	Active Learning	3 minutes
5	8	Knowledge Segment	15 minutes
6	9	Procedural application	11 minutes
5	10	Knowledge Segment	14 minutes
6	11	Procedural application	11 minutes
3	12	Knowledge Segment	15 minutes
7	13	Case Study (baseline)	10 minutes
5	14	Knowledge Segment	15 minutes
7	15	Case Study (part II)	7 minutes
5	16	Knowledge Segment	10 minutes
7	17	Case Study (part III)	9 minutes
8	18	Assessment	16 minutes
9	19	e-Evaluation	5 minutes
		Total Instructional Time	180 minutes
10		Toolbox and Resources	0

Attachment D. Comparative Assessment of Learning Systems

Comparative Analysis of e-Learning Systems. A learning management system (LMS) is a cloud-based application with host infrastructure to delivery online education and training programs to a geographically dispersed population. Some local installations are provided. Hundreds if not thousands of LMS are available each with different features created to serve their target education or training market. Example of target markets are academic courseware such as Blackboard or massive open online classrooms (MOOC) products such as Moodle or Canvas. These LMS products support long, text intensive courses in an academic setting. Faculty interaction with students is part of the classroom experience.

Corporate training platforms, on the other hand, deliver skill training for worksite preparation. These training systems are not designed to support the base of scholarship behind prescribed action. The specific requirements of the Philippines DOH Academy and the HRH2030 project falls between the academic and worksite training. Health worker preparation requires both a strong base of scientific knowledge and specific skill development, particularly critical thinking and application of knowledge to real world urgent and emergent problems. Training platforms offer the benefit of reduced distraction and laser focus on competencies and outcomes.

Based on adult pedagogy (andragogy) the DOH Academy platform can foster active learning by health care practitioners. Criteria for LMS selection by the DOH Academy include:

- Capacity to support hybrid experiential learning that addresses the needs of health workers in GIDA settings
- Deliver to a variety of health worker cadres and levels of professional competency
- Interchangeable component parts to maximize re-use
- Favorable, secure, and frequently updated interface with internet browsers
- Ability to function for learners with low-bandwidth connections

Criteria for selection. The selection of an e-Learning System is not only how well the LMS can deliver the programming, it includes company characteristics as well. Questions include: Does the LMS have a proven history of delivering to customers as designed? Can the LMS scale up to 100,000+ learners? Does the price per learner per month go down as the number of learners increases? Does the expense of licenses respond to scale? What invisible costs might be associated with the LMS? For no-cost or open-source systems, what LMS tasks or services are off-loaded to the DOH Academy?

Perhaps one of the most important considerations in selecting the e-Learning system for the DOH Academy, is the clarity, simplicity and usability of the platform for learners, technical staff, and for course owners. Usability contributes to faster dissemination and adoptions of new innovations (Rogers, 1994)

Types of LMS. The criteria for selection are discussed below by contrasting four (4) different types of e-Learning systems:

- Open Source no cost platform with modular format (Open Source)
- Platform built on design and authoring software (Platform/Design)
- Turn-Key portal and platform based on templates and formats (Turn-Key)
- All-in-one portal and platform full-service (Full-Service)

This assessment is not exhaustive or conclusive. The report explores what type of platform will best meet the short and long-term needs of the DOH Academy for continuing professional development. The selection and procurement process will provide vendors requirements for “best fit”.

History and credibility. Commercially available LMS packages are available for each type of e-Learning system. Contracts and licensing requirements may vary, but each category has one or more LMS with a 3+ year history of reliable delivery. Every year, training and LMS platforms enter the market. While these companies may be innovative, the history of an LMS demonstrates that the company has a credible customer based and letters of reference can be presented upon request.

Criteria for Long-term success. Two critical factors in the long-term sustainability of the project include:

- a) *Usability.* Usability is the simplicity or intuitive movement between the user and the technology. An e-Learning system is more usable when the distractions are removed, when clear options are presented, and next steps are intuitive. Symbols, graphics, sounds and colors are fully utilized consistently to guide the learner in the classroom. Are the expectations of the learner stated upfront? Is the module self-contained or does the learner have to exit the module, enter new locations, re-enter the e-Learning platform, or wait for a response/grade from the instructor? Is new terminology defined? Are the tools and resources available as a toolbox in the classroom or must a learner click out of the classroom to get the information they need? Are the concepts presented in an organized fashion and a logical sequence?

Module owners and instructional technology staff also require useful, simple, clear instructions on how to create a module, how to use the micro-segments, and where to generate a learner assessment. Menus and reporting functions are important tools that use understandable language and useful information.

When applying usability criteria, LMS platforms performance is across the board. The Open Source LMS historically has been academic in focus, with calendar specific assignments, discussions, text-intensive classrooms, that are designed for higher education readers, rather than practitioners. While module owners can reformat and revised to rate higher usability, these customizations require the time and expertise of DOH personnel. Time commitments in addition to complexity may delay module conversions and start up. Another feature is the use of external links to open educational resources. The classroom frequently “sends” learners out of the classroom in search of internet-based glossaries, resources, discussions, tests and videos. Recent versions have accommodated modular course format but still retain email, chat, discussion, announcements, graded assignments, and other unnecessary functions.

- b) *Scalable module development.* All LMS platforms have been screened for the ability to manage 100,000 learners each year. Most licenses are charged per learner/per month; thus, a more accurate estimate may be in the range of 8,000 to 10,000 learners per month. In order to be scalable, the cost structure per learn/per month must decrease as volume increases. This is not the case for the Modular/Design LMS and the Full-Service LMS. Only the Turn-Key LMS supports templates, highly usable features in the classroom, and organic module packaging features at a low price.

Day-to-day functions and characteristics. Below are functions of e-Learning systems that align with the requirements of the year two workplan.

- a) *Modular format in the classroom.* As discussed in the body of this report, segments and micro-segments are re-usable building block for integrated, interprofessional, just-in-time CPD. Each of the LMS platforms utilizes modules and packaging of modules in a classroom with varying degrees of flexibility. While modular AV formatting is possible, the instructor and staffing requirements of the Open Source LMS creates an invisible cost to DOH.

- b) *Auto-grading with corrections.* Scalability is the ability to reach 100,000+ learners without the typical academic delay in recording grades for each learner. Assuming all health worker in the Philippines took one mandatory instructional hour module and this module had one *manually* graded assignment, an instructor will spend no less than 200,000 minutes (2 minutes per assignment). It would take 416 days of work for one instructor to grade for 100,000 health workers. That is the equivalent to every eight-hour day for an entire year (52 weeks). Auto-grading provides feedback on a learner's response as soon as they hit "return". The response can include on-screen corrections and the better testing systems provide an audio and visual response for reinforcement. In addition to the LMS capabilities, a variety of well-developed online testing systems are available with a subscription.
- c) *Technical assistance to learners.* Only two LMS, the Full-Service and the Turn-Key platforms, provide technical assistance to learners. This includes immediate responses to learner technical concerns by phone and by email. This assistance crosses time zones and could be negotiated as part of the contract or can be included in contracts to local vendors. Other platforms have online services and a selection of videos for information. Regardless of the technical assistance to learners and module owners, DOH Academy customer service by a local provider is strongly recommended to support the transition to a new training model.
- d) *Certificates and learner history.* Successful completion of a module can automatically generate a certificate and can update the learner's history. With the proper reporting functions, successful completion data can be transmitted to the PRC professional boards for CPD certification. Most LMS systems have the capability to provide a personalized certificate to the learner. The Open Source LMS, however, may require a manual response from the instructor to signal successful completion. See reporting for additional information.
- e) *File type.* The LMS must be able to consume video, PDF, PPT, and SCORM files. All file types and sizes must be tested in the classroom to ensure proper operation in low-bandwidth settings.
- f) *Administrative functions and reporting.* The importance of reporting learner data cannot be underestimated. The P6 initiative is built with the hope of using the DOH Academy e-Learning platform learner data could be supplied in specific format to the PRC professional licensing boards to process CPD credits. Reporting is a standard function in most LMS. However, the Open Source LMS operates on a crowd-sourcing model. A reporting plug-in has been tested and new versions are anticipated for upgraded versions.
- g) *Learner encouragement by design.* Gaming theory is used in many LMS to encourage learners, provide badges and certificates. In addition, audio cues can reward success. Every platform has some degree of encouragement. The modular approach when contrasted with the cumbersome academic model, heightens the use of encouragements.
- h) *Administrative enrollments.* Learners can be "enrolled" in a mandatory CPD using administrative functions. The modules are then pushed out to the learner using email and/or through their portal registration. The Open Source LMS appears to offer instructor enrollments in a course. Additional roles for admins may be possible depending on the plug-in and version.
- i) *Experiential opportunities in classroom.* Modules are placed in a classroom where all segments and micro-segments are organized into online offerings. Learner experiences can be structured in a variety of ways using SCORM or other interactive file formats. Authoring software can generate experiential learning exercises in all but the Open Source LMS.

Optional functions. While it is difficult to predict future needs, possible desired functions may include:

- a) *Close Caption or translation.* Translation is possible with some LMS systems. Some have language options available. A written final transcription of all audio and video must be provided in order to process a translation or language subtitles. A commitment to generate transcripts should be considered in terms of module owner's time, as well as usefulness to the physicians, nurses, midwives, and medical technicians enrolled in online learning.

- b) *Capacity to accept payment for registrations.* Many LMS are able to accept online payments, as desired for some modules. Three of the types of e-Learning platforms can accept credit card payments, however, additional secure banking arrangements are required. The Open Source LMS may now accept payments through a plug-in.
- c) *Experiential grading rubric.* In the future an interactive form may be required for supportive supervision activities involving a rubric.

Costs of LMS. There are visible and invisible costs of operating an LMS in start-up and subsequent years. Invisible costs may include the cost of retaining in-house expertise for specific functions. In order to reach a level of scale and affordability, responsibility for operation of the e-Learning portal, learners, and module development must transition from external to in-house knowledge and skill within the DOH.

However, the key difference between the Open Source and all others is the responsibility for the LMS platform (updates, security, technical problem solving, and interoperability). Technology changes and the environment in which an LMS platform operates will necessarily adapt and adjust for reasons of security and interoperability. For the vast majority of technology companies, purchase of a license guarantees the customer a secure up-to-date system that interfaces seamlessly with other apps and browsers. With a license, the responsibility for seamless, secure operations, is the responsibility of the LMS. However, Open Source LMS operate in a knowledge-sharing environment, where fixes are crowd-sourced and shared among a community of users. The Open Source LMS utilizes “add-ons” or “plug-ins” that are created by users or user groups. Each plug-in installation increases the need to troubleshoot interoperability with external interfaces. This may translate into demands on DOH Academy staff experts for technical problem solving. DOH staff effort may be an invisible cost that would grow as the number of learners increase. Another invisible cost is the downtime for the system and learners when problems are encountered.

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