

Use of Learning Platforms for Quality Improvement

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Ensuring quality in healthcare today has become extremely essential to ensure adequate utilization of healthcare services and improved outcomes. In addition to essential infrastructure in terms of safe and adequate space, knowledgeable and skilled health workers, and essential equipment and supply, the healthcare teams and administrators must also acquire knowledge and skills related to quality improvement (QI) methodologies. This review describes the role of learning platforms in teaching QI skills to the busy healthcare teams. Through Review of the published literature, we discuss challenges of learning and applying new skills of QI in day-to-day work by healthcare teams, and how learning platforms can assist in capacity building. There is a significant body of literature on the role of web-based teaching technology and learning platforms in medical education. Using modern communication technology, learning platforms can be established to bring together the healthcare teams, with QI experts to collaboratively learn, execute and share their experiences in improving quality of care in their own healthcare settings.

Key words: *E-Learning, Learning management system, Online learning.*

Healthcare today, especially in the developing countries, stands at a watershed of service availability and variable utilization owing to indifferent quality of care – both perceived as well as actual. With increasing awareness, more and more people are reaching out to health facilities for accessing needed healthcare but the quality of services delivered at the health facilities can rapidly erode their trust and confidence in healthcare system. Quality of care has presently received attention at the highest level in the World Health Organization (WHO). The Director General of WHO, in his inaugural speech, expressed that WHO is fully committed to quality, equity and dignity in services for every woman and every child [1]. Regional director of WHO-SEARO highlighted in her vision that accessible, affordable and quality Universal health coverage (UHC) is the most important game-changer in public health [2]. Quality of care is an important element in UHC that underlies the Sustainable development goal-3, towards which all countries are committed.

It is an essential prerequisite to provide healthcare services that the health facilities have standard infrastructure, adequate number of appropriately skilled health workers, evidence-based guidelines and protocols, and essential equipment and supplies. To ensure that healthcare services are delivered in conformance with pre-decide standards of care, healthcare teams have to be mindful of quality of care

being delivered to their clients and to be empowered with knowledge and skills in continuous quality improvement. However, presence of all these may not result in compliance to standard treatment protocols leading to quality gaps. The science of Quality improvement can bridge these quality gaps by ensuring that compliance to pre-defined standards of care can be consistently achieved in health facilities and duly supported by actions at the health system level.

QUALITY IMPROVEMENT IN HEALTHCARE

Quality improvement (QI) as a principle in healthcare has been borrowed from the industry, beginning essentially from the 1980s. But even long before that the concept of quality in healthcare had existed in recordable form since 1910 [3]. In fact, Nightingale's specific interventions for improvement have been reported previously in much details [4].

In the present times, QI has been defined as an approach to making changes that can result in better outcomes for the patients as well as result in efficient utilization of the available resources and optimal functioning of the system [5]. QI also involves considering the experience of care and ensuring respectful care as an important aspect of healthcare delivery and not just the patient outcomes. Present mid-career busy clinicians and those in leadership positions in the healthcare system might find themselves to be ill-

prepared to lead QI activities since they lack the required knowledge and skills. Acquiring skills of quality improvement is essential for all healthcare workers [6,7].

Commonly used QI methods in health facilities include specific set of skills. QI approach includes building teams of healthcare workers in the health facilities who learn to use the local data to identify quality gaps or problems (non-compliance to standard treatment protocols) at the point of service. The team prioritises the quality problem they want to address and collectively make an aim statement that they want to achieve in short term. They use problem analysis tools like Pareto chart, Five Whys, Fish bone analysis and patient care flow charts to undertake a root-cause analysis. Based on this they identify possible solutions or change ideas and decide on one such idea. They select process and outcome indicators to measure progress. The team undertakes a rapid and short cycle of using the change idea to bring in improvement through Plan-do-study-act (PDSA) cycles. If the change idea succeeds in reaching the aim and improving the quality of care it is sustained in the system of the health facility so that it becomes a norm.

However, such knowledge and skills related to QI have not been included in pre-service education or in-service trainings of healthcare workers in developing countries, Similar to these QI skills can also be learnt if appropriate opportunities are provided.

It is commonly observed that when healthcare teams are provided an orientation or an introductory training in QI they cannot be expected to practice this without ongoing support. Since these are relatively new skills they must be supported by facilitators for clarifications and problem-solving as they begin practicing QI upon return to their place of work. Hence an initial training of healthcare teams in QI must be followed by ongoing on-the-job mentoring to enable them to apply and practice the newly acquired knowledge and skills.

Such support is difficult to provide through field visits and face-to-face mentoring in an ongoing manner due to distances between centers and time-constraints. Moreover, the number of QI facilitators may not be adequate to provide the ongoing mentoring to multiple healthcare teams. At the same time, healthcare teams can learn effectively from similar teams who may be practicing QI in their own health facilities as well as those in the neighborhood. Such opportunities promote cross-learning, healthy competition and motivation in QI. Given this need of bringing together the QI practitioners with each other and with QI coaches, internet- and web-based learning platforms present a plausible solution to collaboratively learn, apply and share their experiences

for continuous QI.

This article presents the characteristics and advantage of online learning platforms and reviews the published evidence for use of such learning platforms in medical education and potential use in quality improvement programs.

ONLINE LEARNING PLATFORMS

Technology now plays an important role in educational transformation. The online learning platforms provide a reasonable combination of accessibility of knowledge with learner flexibility and interactivity. This learner centred approach, also called asynchronous e-learning [8] can help balance professional development with personal and work commitments.

Components of Learning Platforms

A Learning platform is a framework of tools that work seamlessly and unify educational theory, practice, technology and content [9]. From educational perspective, a Learning platform is an integrated set of interactive online services that provides the teachers, learners and others involved in education with information, tools and resources to support and enhance educational delivery and management [10,11]. When used properly, it can reduce teacher workload, minimize expenditure, and enhance teaching and learning. Creating a learning platform requires some basic pre-requisites (**Table I**). Various attempts have been made to develop international standards for Learning management systems [12-14]. These include choosing a user-friendly learning management system, creating course content and curriculum mapping, creating learner engagement tools by judicious use of interactive and multimedia content, enabling learner assessment in an objective manner and providing communication tools such as email, messaging, internet or mobile calls, discussion forums, blogs, etc. Content management enables coaches to create, store and repurpose resources and course work.

Advantages of Learning Platforms

Learning platforms are beneficial for group learning where healthcare teams can not only learn together synchronously in their own learning and also collaborate with others in different health facilities for mutual learning in the whole network. Learning platforms can create a network of QI practitioners (healthcare teams) as well as mentors (QI coaches) and mentees (healthcare teams) who are all connected through information and communication technology solutions while they continue to remain at their own work places without too much disruption in their routine work.

TABLE I PREREQUISITES FOR A LEARNING PLATFORM

<i>Feature</i>	<i>Implication</i>
User-friendly	Scope for asynchronous and synchronous communication using emails, chats, announcement areas and discussion forums
Creation of course content	Availability of a variety of learning resources including power points, case studies, webinars and videos and links to other internet resources)
Curriculum mapping	Planning the delivery of content starting from learner registrations to proposed timelines, managing learner activities and tracking online office hours.
Learner engagement tools	Judicious use of interactive and multimedia content.
Learner communication and assessment tools	Online multiple choice questions, case scenarios, collaborative projects.

Such learning platforms are used for enabling healthcare teams in the whole cycle of learning from initial training to acquire new skills of improving quality of care followed by ongoing coaching to effectively apply QI skills in their day to day work, continuously practice quality improvement by undertaking micro-projects and sharing their experience with peers and coaches.

USE OF LEARNING PLATFORMS IN MEDICAL EDUCATION

There is an extensive body of literature on the role of web-based learning platforms in medical education [15]. In a recent systemic review, 251 articles on software platforms and interventions in medical education were analyzed as well as experience from 25 learning platforms [16]. The authors observed that with regard to the use of learning platforms in medical education, there was a trend towards using reusable software platforms with special emphasis analysis of online activity for an interactive feedback and more student centered models.

Learning platforms have been utilized in a variety of ways. Apart from being a standalone method for delivery of a concept or a skill, these have been integrated with traditional teaching methodologies in a symbiotic manner for the benefit of the learner. Use of learning platforms has shown to improve the persistence and completion rates of the intended program [17]. Stewart, *et al.* [18] found that the group of medical students who received blended learning which had an online component, in addition to the conventional teaching, achieved a significantly higher mean score in a module for teaching newborn physical examination skills than the control group.

These are some of the advantages that make online teaching platforms attractive for teaching quality improvement science to the healthcare professionals. Most of the professionals (doctors, nurses, paramedics, administrators/managers) trying to learn and practice QI methodology can be pressed for time due to heavy

workloads they already may have. Online platforms are good solutions for diverse teams of professionals because they can learn as teams and also get tailored content for their discipline. Others have reported on use of e-learning platforms for patient safety [19,20] and factors affecting successful utilization [21].

The various virtual training tools in QI can similarly train health professionals in understanding the concepts of QI by presenting simulated settings which can be later replicated or extrapolated in the real-life scenarios. Another role of web-based learning platforms has been explored in fields like occupational medicine [22] where rarity of clinical situations makes traditional bedside teaching quite limited. The essential learning from this online platform (NetWoRM Europe) is the knowledge sharing among multiple groups that has been inculcated to overcome the serious limitations of rarity of disease findings. Taking cue from this experience, learning achieved in QI projects at one health facility can be used for learning for teams at other health facilities through a common learning platform.

Currently Available QI learning Platforms

We briefly describe selected learning platforms available for quality improvement.

Institute of Health Improvement (IHI) [23]: Institute of Health improvement has an online learning platform for providing education in the improvement science. The educational programs and trainings offer webinars, presentations and audio- visual aids for understanding the essential principles and tools of QI. Besides providing an understanding of improvement science, the platform provides opportunities for in-person and virtual training in professional development programs as Improvement advisors or in Leadership programs. IHI Open School is a unique concept that provides a wealth of knowledge to the QI enthusiast. There are certified online courses and a section called Practicum which

certifies a practical care improvement process in the learner’s own settings.

International Society for Quality in Health Care [24] (ISQUA): Another prominent QI learning platform is the International Society of Quality Improvement in Health care. It provides web-based educational opportunities through structured fellowship programs broadly divided into seven modules namely; leadership and health policy, patient centered care, patient safety, education and research, health information and technology, external evaluation systems and quality and safety in developing countries. There is also opportunity to learn as mentees from experts on board or become virtual mentors for various QI teams in various geographical regions across the world.

POINT OF CARE QI (POCQI)

South-East Asia Regional office of WHO (WHO-SEARO) is working with countries in the region to develop capacity in preparing national plans and roadmaps for improving quality of care for maternal, newborn and child health and provide knowledge and skills to healthcare teams to improve quality of care in their own health facilities. For this, POCQI model has been developed by WHO-SEARO, WHO Collaborating Center for Newborn (WHOCC AIIMS) and ASSIST (United States Agency for International Development Applying Science to Strengthen and Improve Systems) and is supported by UNICEF, UNFPA and USAID as a collaborative QI model in the South-East Asia Region. The POCQI package [25] provides a simplified model for initial training of healthcare teams in a four step process by using local data to identify quality gaps, analyze underlying causes and improve health care practices in their own specific context without much additional resources. The four step

approach includes identification of a problem, forming a team, making an aim statement (Step 1), using analytical tools for identifying the root cause of a problem (step 2), planning an intervention using Plan-Do-Study-Act cycle (Step 3) and plans for sustaining the change (step 4). This simple common sense approach to problem solving encourages frontline workers to begin by changing the circumstances within their sphere of influence and slowly work their way up to a systems change to ensure sustenance. In addition to POCQI training manuals, a coaching guide for ongoing on-the-job coaching and an implementation guide for institutionalizing QI in district systems have also been developed.

To scale up the capacity building in quality improvement in countries of the Region WHO-SEARO has supported WHO Collaborating Center at AIIMS, New Delhi to develop Regional POCQI Learning Platform. It includes four ways in which countries and facility teams are being supported in their QI efforts:

- (i) *In-person* training: Trainings, workshops and coaching visits for QI capacity-building.
- (ii) *Remote coaching support*: QI coaches have been assigned to support POCQI trained hospital teams in the countries to provide ongoing mentoring through modern communication technology.
- (iii) *Dedicated website* [26]: The Point of Care Quality Improvement website (www.pocqi.org) has been developed. This website has a wealth of resources and information viz., Training materials, including the POCQI Learner’s Manual and the POCQI Facilitator’s Manual; Video lectures on quality improvement; POCQI Virtual Workbook: This is a case-based e-learning tool in the POCQI model; QI experiences

TABLE II BENEFITS OF A LEARNING MANAGEMENT SYSTEM AS RELEVANT TO COACHING IN QUALITY IMPROVEMENT METHODOLOGIES

<i>Benefits of Learning management system</i>	<i>Relevance to QI coaching</i>
Organizes eLearning content in one location	Ready availability of coaching modules for a step-by-step approach
Provides unlimited access to e-Learning materials	Options of completing courses at convenience rather than a fixed time
Easily tracks learner progress and performance	Gives the QI coaches an opportunity to track the progress of the mentee and give a feedback
Reduces Learning and Development costs and time	Step by step webinars and virtual platforms can provide training opportunities to QI enthusiasts in remote places or different countries also where direct training may not be feasible.
Quickly and conveniently expands eLearning courses	Any course material can be updated at a nominal cost and made available to all learners
Integrates social learning experiences	Provides an important link to other social and professional platforms for connecting with QI enthusiasts from different parts of the world.

from hospital teams: QI project posters and QI project videos; It also has space for each country to share their progress with the network; and Technical resources like recent publications will be posted on the website for everyone to use.

- (iv) *Webinars*: A series of webinars have been launched in May 2018. Two types of webinars are planned: teaching webinars on QI topics to upgrade the QI knowledge and skills; and experience sharing webinars, for QI teams from various countries to share their work on QI so that teams in the Region could learn from each other.

A virtual learning platform has been created by linking the QI experts (mentors) to the healthcare teams (mentees) located in different places. These healthcare teams were initially trained by the same QI experts in New Delhi in an inter-country workshop. In the follow-up the mentors and mentees were paired and they used emails, phone calls and video calls to communicate with each other. The mentors remained in touch with the mentees and provided clarifications, problem solving and technical support in an ongoing manner. This support was effective in keeping the motivation of newly trained healthcare teams high and they continued to implement QI projects in their hospitals and acquired confidence to sustain the practice.

The platform provides a common ground for QI enthusiasts from the SEA region to come together and learn from each other's experience with QI projects. The website also provides an educational tool for the POCQI methodology.

CONCLUSION

Learning platforms provide the opportunity to share a wide range of teaching and learning resources and experiences among learners and teachers. *This is also an effective way to collaborate on projects with co-learners and teachers. These can both motivate and support independent learners.*

Online learning platforms provide an attractive modality for teaching and learning in medical education and QI methodology to the healthcare professionals, bringing them together for a knowledge sharing and collaborative learning experience.

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