

# **Continuing Medical Education for Medical Practitioners Through the Use of ICT**

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## **ABSTRACT**

External and internal forces are shaping the professional development of many professionals. The medical practitioners are not alone and instead they often feel the heat as rapidly advancing medical technologies and higher patient and society expectations are all forcing doctors to update their knowledge on a regular basis. It has become a life-long responsibility for all doctors, local and overseas, to be involved in continuing medical education (CME) and Continuing Professional Development (CPD). However, doctors are also faced with the problem of physically attending medical lectures as these meetings often conflict with their schedules of patient care.

To address the issue, the HK Doctors' Union (HKDU) and the Open University of Hong have joined forces to work on means in helping and encourage medical doctors to the life-long learning of continuing medical education through Information and Communications Technology. ICT is helping doctors overcome this timing problem.

In this paper, we first present the rationales and the framework of CME and CPD. Next we outline the development of our CME learning site and some of the innovative ideas that we have implemented in the site. The paper should be of interest to modern educators who are keen to incorporate ICT in their teaching, delivery of training and encouraging partnerships with professional bodies to enhance their students learning etc.

**Key words:** Continuing Medical Education (CME), Continuing Professional Development (CPD), Virtual Training, Best Practices, OPMS

## INTRODUCTION

In a knowledge society, there is a far greater demand on the right information at the finger tip 24 hours a day. This is particularly the case for professionals such as medical practitioners because there is not only a rapid advance in medical technologies and techniques, newer diseases but also a higher healthcare expectations from patient, their families and the society in general. All this points to a higher demand for doctors' time in balancing patients care and continuing learning via seminar/conference participation or some kind of formal training.

To address this conflict of time and limitations of face-to-face attendance of continuing education courses, the HKDU joined forces with the Engineering Science Programme of the Open University of Hong Kong to develop The Online Presentation Multimedia System (OPMS) -- a continuing medical education platform developed locally for medical doctors. In addition to a typical bi-weekly face-to-face medical seminar given by members or visitors or guests, HKDU also provides a CME site, <http://cme.hkdu.org/>, which provides a one-stop solution for the CME needs of doctors, both in Hong Kong and overseas.

Section 2 of this paper describes the visions, objectives and goals of the CME projects. Section 3 describes the system architecture and design. Section 4 describes the unique features of our system. Section 5 provides a summary of the lessons learned and the final section provides a future development direction.

## VISION, OBJECTIVES AND GOALS

Rapidly advancing medical technologies, higher patient expectations, and the availability of abundant patient health information on the Internet are all forcing doctors to update their education on a regular basis. These trends manifest themselves in at least two dimensions: an increase of time for patient consultations and a decline of time for personal development. Figure 1 illustrates this manifestation.

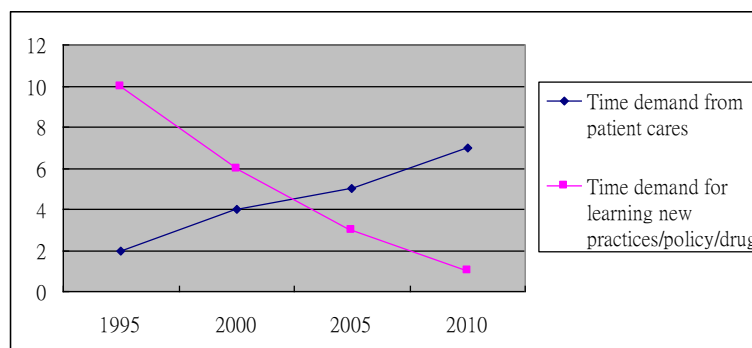


Figure 1: Manifestation of demand of time on practitioners

As part of the Life-long-learning process for all doctors, local and overseas, most (if not all) are involved in Continuing Medical Education (CME) and *Continuing Professional Development (CPD)*. However, doctors are also faced with the problem of these medical lectures conflicting with their schedule of patient care. In this section, the rationales and framework of CME and CPD are presented. So what is the generally accepted definition and framework of CME.

CME is defined as

*Educational activities which serve to maintain, develop, or increase the knowledge, skills, and professional performance and relationships that a physician uses to provide services for patients, the public, or the profession*  
[source: ACCME: Accrediting Council Continuous Medical Education]

In associated with the term CME, there is a closely related term, CPD, Continuing Professional Development. CPD refers to the

*development of competencies relevant to the practice profile of a practitioner that may change over the years, and professional development endeavours are directed at enhancing his quality of care and the delivery of safe standard of practice*

[Source: Tang G. CPD-A surrogate for recertification. Ann Acad Med Singapore 2004;33:711-]

While there might have been clear differences between CME and CPD as suggested in Kwan (2002), ICT has advanced in such a pace that the differences are becoming blurred. For example, we will argue that the following difference between CME and CPD are no longer valid.

<b>CME</b>	<b>CPD</b>
<b>Educator centred</b>	Learner focused
<b>Little direct impact on improving professional practice</b>	Good for quality management in terms of changes
<b>Passive learning</b>	Active learning

Table 1: Contrasting CME and CPD

Chan, KW (2002). Medical education: From continuing medical education to continuing professional development. *Asia Pacific Family Medicine*; (1) 88–90

Instead, we consider CME and CPD are now an integral part of each other and expanding the definition of CME to incorporate CPD.

Through the CME/CPD framework, doctors are encouraged to demonstrate that they are maintaining their skills in their practice. The framework allows doctors to develop professionally

and to learn from more informal experiences; encourages and motivates doctors to learn; meets each doctor's individual needs, ambitions and personal learning styles, and become more effective in changing one's behaviour/practice.

## **SYSTEM ARCHITECTURE OPMS**

In this section, we begin with an overview of the HKDU site in general, and move onto the more specific CME site and its core component of Online Presentation Multimedia System (OPMS) which is an on going joint development project of the HKDU and the Engineering Science Programme at the Open University of Hong Kong.

### ***The Hong Kong Doctors Union***

Hong Kong Doctors' Union is the one and only trade union specially designed for all doctors in Hong Kong who are either working as employees or self-employed. The primary objectives have changed from the basic task of supervising allocation of public housing estate clinics in the very beginning to higher ideals of safeguarding the welfare and rights of doctors.

HKDU is a highly motivated, conscientious and energetic doctors group. We never stop alerting the authorities to all threats to the freedom of and fairness for the private and single handed doctors while appealing for the overworked public doctors. HKDU appealed many times to different authorities to ensure fairness to all. HKDU reported improper practices by drug stores and unfair canvassing. HKDU openly appealed to the Government and alerted the public to the risk of SARS well ahead of the Government in Spring 2003, calling for wearing of masks and implement other protective measures before the Government. The media has been giving us credit for such a service to the community. Under the Management of HKDU, a Hong Kong Doctors Directory, approved by the Medical Council of Hong Kong, is now available to provide the public with free and easy access to doctors' information.



Figure 2: Official Website of Hong Kong Doctor's Union

### ***The HKDU CME site***

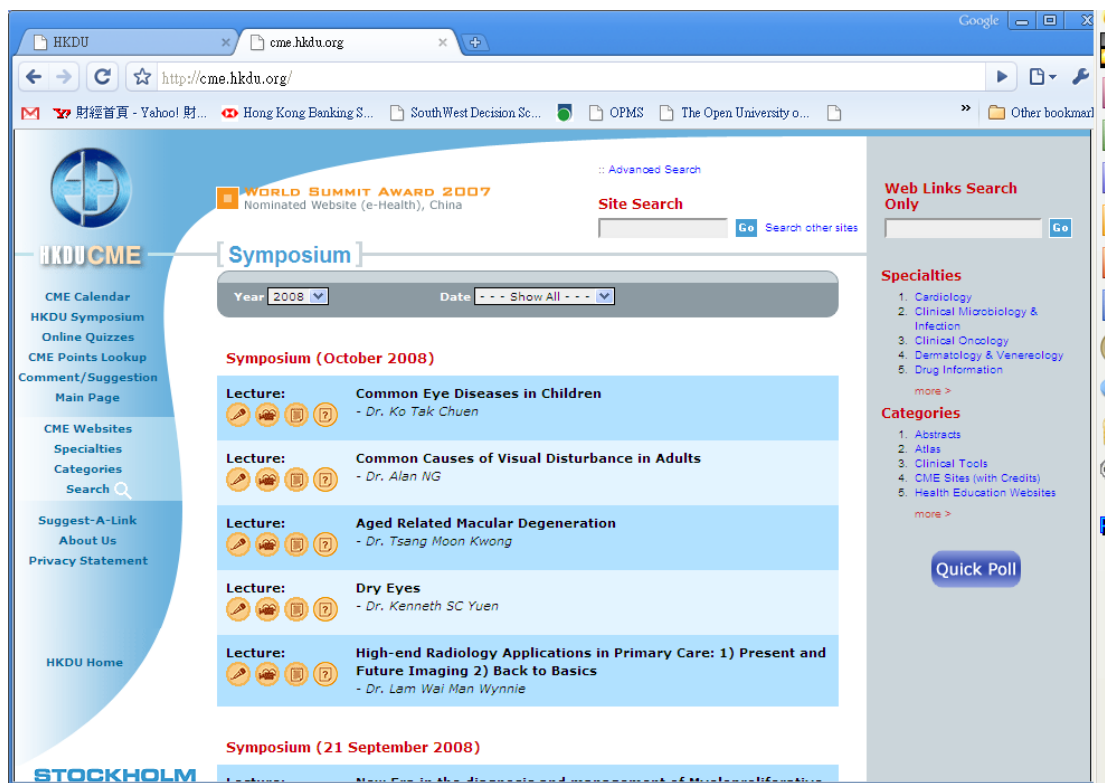
Continuous efforts were made to provide the best practical CME for doctors. HKDU has a long history of organizing formal CME activities and possesses immense experience. Besides our regular monthly Sunday afternoon symposia attended by over 400 doctors and luncheon meetings with 100 doctors, we have 23 study groups to provide CME activities for all HK doctors. In particular the Sunday afternoon symposia have been praised for being well presented, informative, practical and useful.

As an accredited CME provider, a CME Programme Accreditor and a CME Programme Administrator, HKDU came top among ten CME Providers in Hong Kong. Figure 3 shows the home page of the Continuing Medical Education site of the Union.

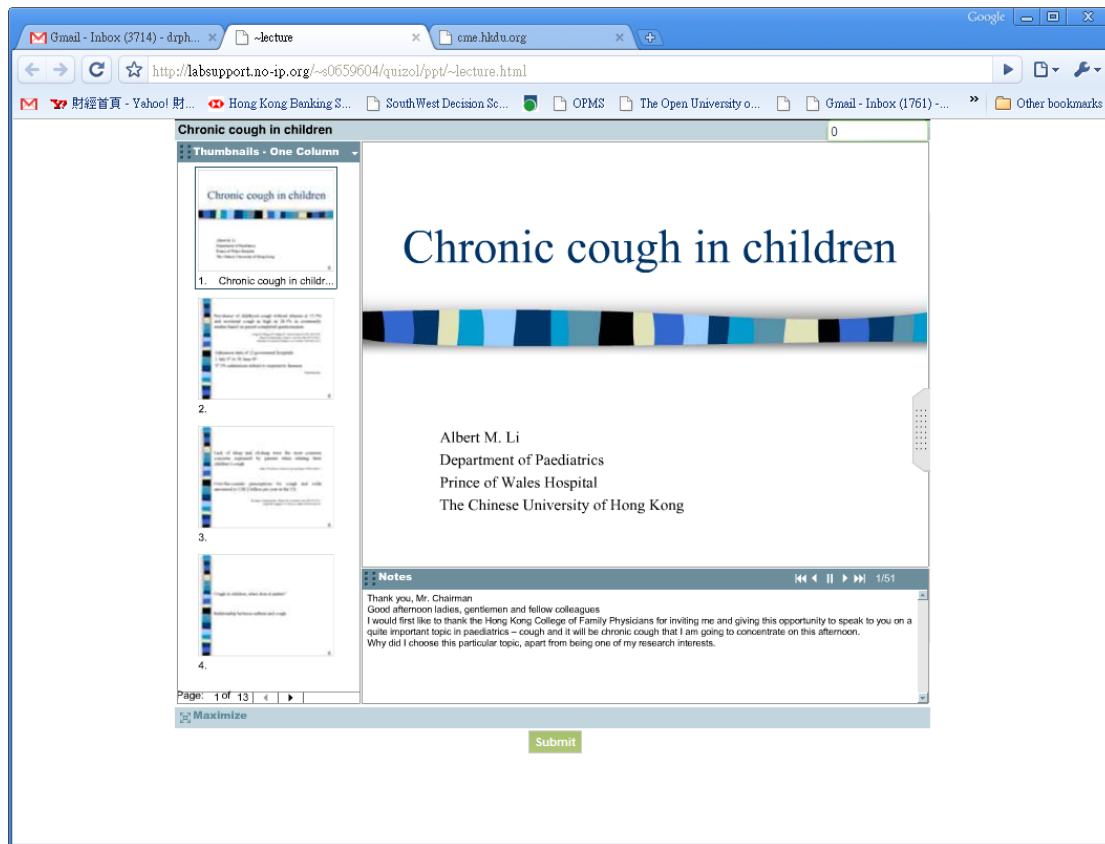


Figure 3: Hong Kong Doctors' Union Continuing Medical Education Site

The continuing education mission is to optimize medical patient care through enriching medical practitioner's knowledge. To this end, CME courses/seminars/symposia are also captured and provided online for those who can't attend the events physically. Figure 4 provides a glance of our online courses. Figure 5 shows a specific example. In the later case, the voice over Powerpoint slides technique was used [Tsang 2008]. To save file size, the slides were converted in Flash movie format.



*Figure 4: Sample of CME courses and seminars*



**Figure 5: Online Chronic Cough in Children Seminar**

### **ONLINE PRESENTATION MULTIMEDIA SYSTEM , OPMS**

OPMS is a web-based and desktop solution for e-Learning and online training. The system makes use of the advanced ICT and Human Computer Interface Design technology (Flex, AIR, XML: Visual Studio 2008, Flex for the OPMS display; DB2 for the OPMS database, Apache + PHP for the OPMS codes, MindManager for the OPMS design. <http://www.mindjet.com/>). Collectively, these tools enable our project students to create an engaging, cross-platform and rich Internet online education platform which we coded OPMS.

For illustration purposes, we will highlight two of such tools (Flex and MindManager) for the benefits of our readers:

Flex is a highly productive, free open source framework for building and maintaining expressive web applications that deploy consistently on all major browsers. Our project students at OUHK build the OPMS Flex application using the free Flex tool. Of course another choice was to you the Adobe® Flex® Builder™ 3 software to accelerate development time but the free version was used to minimize tangible cost. [ <http://www.adobe.com/products/flex/>]



Mind manager [Mind Manager, <http://www.mindjet.com/>] enables project students to consolidate their project and ideas into a single map and to create dynamic content with integrated Web services and database linker among other advantages. We are very appreciative of the support of IBM for donating a professional copy of the DB2 for the OPMS project.

Early version of OPMS has two components i.e. user and administration interfaces (See Figures 7 and 8). For example, normal users can gain access to the OPMS through the Internet, having revisions or quizzes of their studies while administrators (e.g. teachers, professors, administrative staff of HKDU) can use the same interface to upload and manage the materials for the audience.



Figure 6: User interface of OPMS

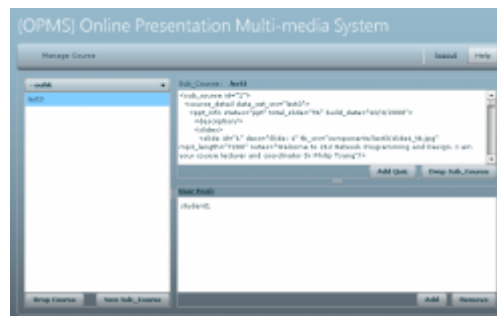


Figure 7: Administrator Panel Interface of OPMS

Using AIR Technology [<http://www.adobe.com/products/air/>], our project students use proven web technologies to build OPMS that runs outside the browser on multiple operating systems. As a result, we developed two versions of OPMS, one is browser accessible while the other is specially designed for regular using desktop application, so that no repeat download is required

for daily usage. Figure 8 shows a schematic of the System Architecture of the Online Presentation Multimedia System.

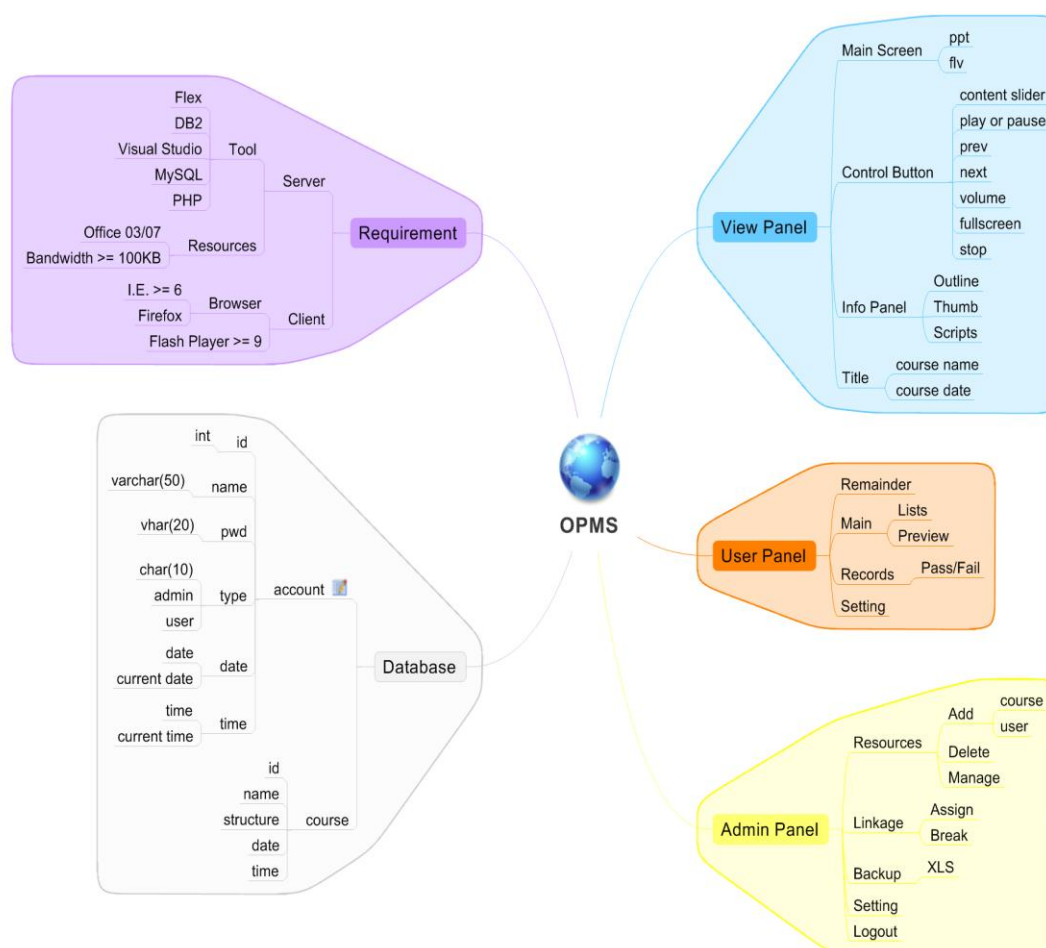


Figure 8: System Architecture of the Online Presentation Multimedia System

## UNIQUE FEATURES OF CME SITES AND OPMS

CME resources on the Internet, both local and overseas, can be located with ease using a search engine. An archive of over 200 local medical lectures (voice-over slides) of different specialties is available for doctors to study at their own time, pace, and area of interest. For overseas CME resources, we have built a library of CME web links (annotated) on the Internet. All the websites in this library are categorized according to the medical specialty (e.g. urology, dermatology) as well as the nature of the website (e.g. journals, textbooks, practice guidelines). There are also online quizzes in dermatology, radiology, ECG and self-study articles for self assessment. CPD Credits will be granted for passing 80% of the online-quizzes of a given presentation.

Our reader may ask what so unique about our aCME site. In the past, we only provided a typical voice-over Powerpoint of the seminars/ presentations in either English or Cantonese (Subject to the preferences of the speakers).

After the introduction of OPMS, besides the typical English Version, we also have the Cantonese and Putonghau versions. The later are important as we wish to increase our impact in Mainland China by providing free services for their medical practitioners.

The style of traditional online presentation (as in most CME sites on the Internet) suffers from one major criticism: how do we know the identity of the online learner? Put it more formally: How do we authenticate the users? Or do we ever want to authenticate users?

While in traditional CPD credit offering, the accumulation of certain physical attendance hours serves the CDP certification purpose, in our online version, we have moved the authentication and “quality of attendance” into a new level.

For CME credits, besides the typical login-password authentication approach, doctors need to fill in quality checking questions (in the form of Multiple Choices) which popup randomly every 10 minutes or so while the doctors watch the online presentation. Figure 9 shows one of the pop-up MC screen when one takes the Online Chronic Cough in Children Seminar illustrated in Figure 9

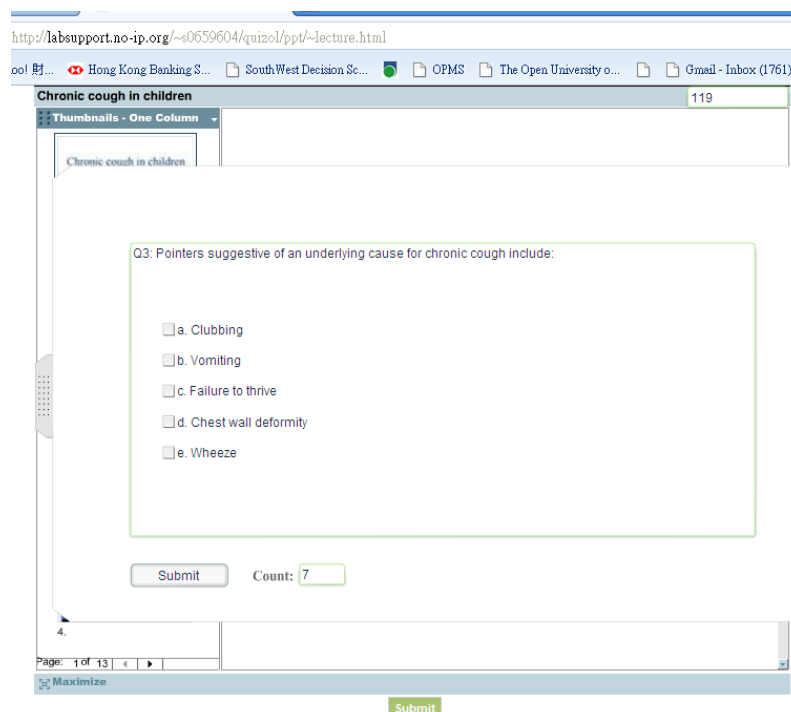


Figure 9: Pop Up Multiple Choices Window

The answers of the doctors are kept in a database profile. If the doctors have more than two questions wrong out of the 5 short questions, no CPD credits will be given to that particular online seminar. There is a continuous debate about balancing the user friendliness of CME site and authentication and thus we have taken a good balancing act by using traditional password approach plus quality random multiple choice questions to seek input from viewers.

## **SUMMARY**

It is envisaged that ICT will play an increasingly important role in CME in the time to come. As a matter of fact, the ICT experience is already up to if not much superior to traditional physical attendance at lectures and seminars. CME materials can now be created in a multimedia format, and with integrated interactivity, the learning and teaching conducted could become more effective and efficient. The literature is also not in lack of best practices for delivering continuing education courses.[McKinnie 2008]

There is, in fact, a great deal of effort put into preparing CME materials by different academic institutions in different parts of the world. However, many of these CME websites are poorly marketed, and few doctors know about the existence of these useful CME sites. While doctors are always busy hunting for CME materials on the web, results from search engines often give commercial and outdated information. Now is a good time to bridge this gap. Indexing, categorization of CME websites, and directory services for CME sites will allow these CME resources to be utilized better by medical practitioners. In the HKDU's CME website, annotations and comments will be added so that users will find it easier to identify which CME websites to visit.

In the future, ICT will play a major role in the effective and efficient delivery of educational materials for practicing doctors, as doctors can make use of CME sessions in their free time, at their own pace, in their own areas of interest, and have their efforts credited.

It is our firm belief that ICT will become an ideal platform for future CME activities. Apart from the website's existing features, more multimedia educational materials may be created with advancing computer/graphics technology, which can make CME far more effective and efficient than conventional lecturing using a projector, held in a hotel function room. Using the Internet, more interactivity can be established between the doctor and the educator, while also saving valuable travelling time for practitioners.

The HKDU's website will serve as a showcase for CME on an ICT platform, with the aim of inviting more comments and inspirations from our users on various areas of improvement. The website's current improvements include allowing online registration for CME events (via our CME calendar) with multi-lingual lectures so that doctors with different mother tongues can listen to lectures in different languages. We have plans to address the difficulties of granting credits based on authentication and virtual attendance of CME lectures and courses by using an Electronic Certificate approach and randomized quizzes during the CME lectures and courses. Distance learning and Certificate/Diploma courses can also be delivered through this ICT platform.

## ACKNOWLEDGEMENTS

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