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# e-Learning: a model to support ongoing education

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OPINION

## INTRODUCTION

Education is fundamental for creating opportunities, empowering individuals and stimulating long-lasting change in communities. It is internationally recognised that education is the right of every child and must be equally accessible to girls and boys and be free and fair [1]. Access to education relates to all children attending and completing primary school, secondary school and tertiary or vocational education. In this process great teachers have the power to instil a love of learning, leading students to embrace education as a vital tool that provides opportunities to foster growth and success for themselves and the wider community. Many of these fundamental concepts surrounding education can be equally applied to adult learners. (Figure 1)

The opportunity for on-going education for professionals in medical science is important for ensuring that the quality of patient care remains optimal. International guidelines and standards, such as ISO15189:2012, include requirements for on-going education in their documents to ensure employers and employees are held accountable for this activity [2]. However, the reality is that developed urban

**Figure 1** **Article 28 of the Convention on the Rights of the Child**

1. States Parties recognize the right of the child to education, and with a view to achieving this right progressively and on the basis of equal opportunity, they shall, in particular:

(a) Make primary education compulsory and available free to all;

(b) Encourage the development of different forms of secondary education, including general and vocational education, make them available and accessible to every child, and take appropriate measures such as the introduction of free education and offering financial assistance in case of need;

(c) Make higher education accessible to all on the basis of capacity by every appropriate means;

(d) Make educational and vocational information and guidance available and accessible to all children;

(e) Take measures to encourage regular attendance at schools and the reduction of drop-out rates.

2. States Parties shall take all appropriate measures to ensure that school discipline is administered in a manner consistent with the child's human dignity and in conformity with the present Convention.

3. "States Parties shall promote and encourage international cooperation in matters relating to education, in particular with a view to contributing to the elimination of ignorance and illiteracy throughout the world and facilitating access to scientific and technical knowledge and modern teaching methods. In this regard, particular account shall be taken of the needs of developing countries" [1].

*Article 28 of the Convention on the Rights of the Child which was adopted and opened for signature, ratification and accession by General Assembly resolution 44/25 of 20 November 1989 entry into force 2 September 1990, in accordance with article 49 of the United Nationals. Many of these principles, particularly 28.1c and 28.3, can be applied to the direction of efforts for ongoing education in medical science (Figure 1).*

communities have greater access to on-going education compared to rural, remote and developing communities. Now we possess the information communication technology (ICT) capability to make significant steps in addressing this disparity. As such, e-Learning can be implemented to reach out to health professionals who have previously not had the same access to opportunities for professional development.

This manuscript is an outcome of a presentation which aimed to discuss the development of an e-Learning strategy for the medical science community in Myanmar. To achieve this aim, some definitions, examples, recommendations and personal thoughts related to e-Learning are provided.

## LEARNING STYLES AND STRATEGIES

On-going education for health professionals is important for optimising the quality of patient care. The preferred method for providing professional development activities remains debated, and this is not surprising given that individuals can have different styles of learning [3].

The main learning styles are: visual learners (divided further into two sub-channels of linguistic and spatial); auditory learners; and kinaesthetic learners (divided further into two sub-channels of movement and tactile i.e. touch). Ideally on-going education activities should encompass aspects that incorporate all of these learning styles.

There are seven main learning strategies for on-going education; these being lectures, reading, audio-visual, demonstration, discussion, practical doing and teaching others. Lectures, reading and audio-visual strategies are key activities that can be provided face-to-face and delivered equally well remotely through ICT. Demonstrations can also be provided as part of face-to-face training or incorporated into audio-visual e-Learning. Discussions and practicals are often best delivered face-to-face, although there are some examples of applying these on-line. Finally, "teaching others" by any of the other six strategies provides an effective learning approach; hence learners should be encouraged to deliver professional development activities. Each of these learning strategies has been applied with varying success to e-Learning.

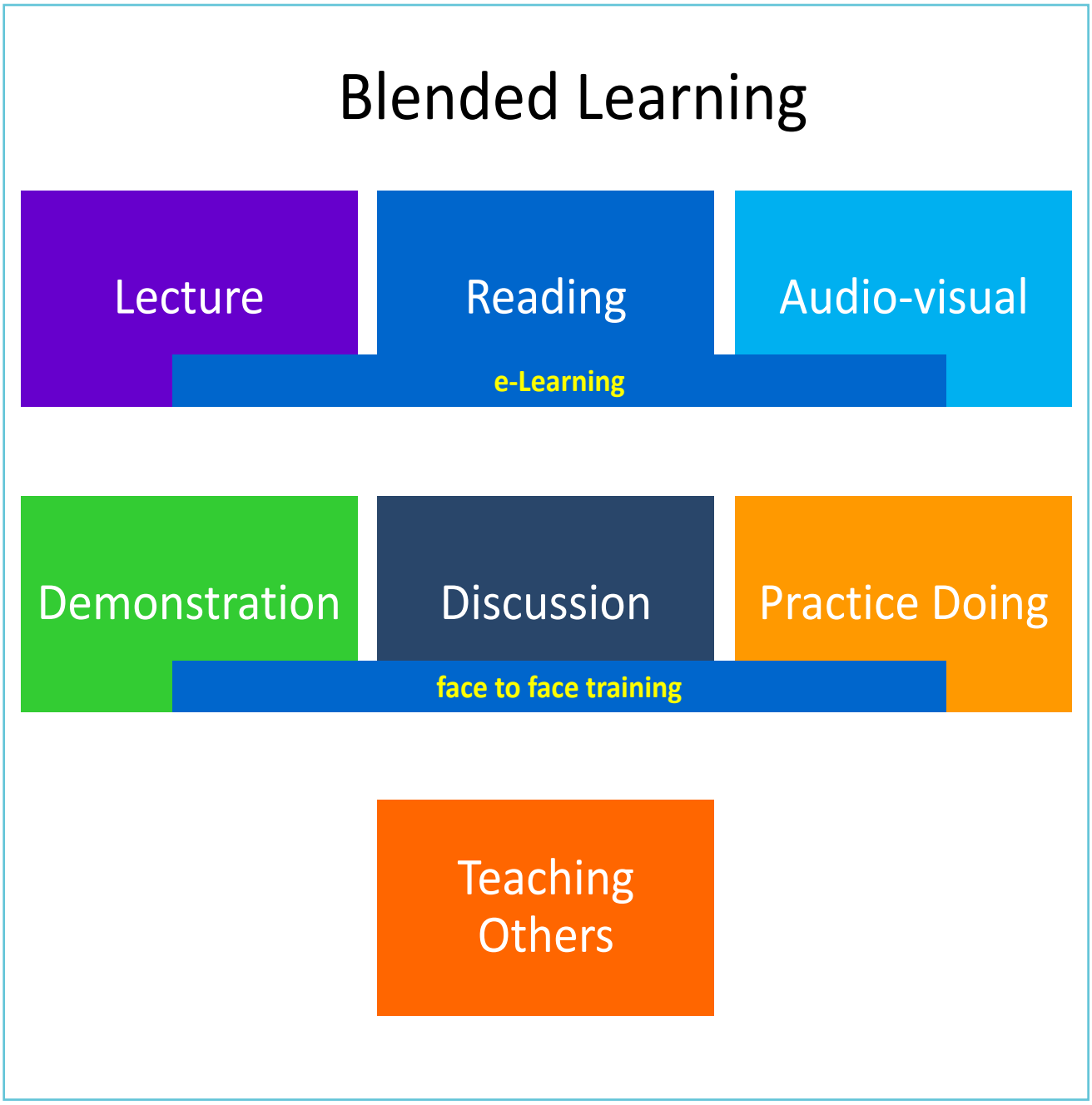
A simple and clear definition of e-Learning is "learning conducted via electronic media, typically on the Internet" [4]. E-Learning's greatest advantage over many other forms of education delivery is that it can be accessed twenty four hours a day seven days per week from almost anywhere and is cost effective. As such, e-Learning activities have increased significantly in recent years, and many industries worldwide have actively embraced this approach for compliance management and on-going professional development. The breadth of activities has led to a variety of terms used synonymously with e-Learning (including blended learning, on-line learning and distance education) and the definition can vary as the result of adapting the term for an organisation's specific purpose [5]. Whilst e-Learning offers many advantages, the computer based approach cannot currently achieve all goals, especially related to hands on practical experience. Hence, universities in particular are now embracing the concept of "blended learning" which combines e-Learning with face-to-face workshops/practicals. Figure 2 demonstrates the potential approaches for blended learning, demonstrating the main role of e-Learning.

## PROFESSIONAL SOCIETIES' ROLE IN e-LEARNING

Significant professional and personal benefits arise from individuals engaging with their relevant professional society. Engagement provides a network for individuals to exchange ideas and remain up to date with wider developments in the field. Often, a primary goal of such societies is to promote on-going education activities which are often valued by industry for their perceived relevance and commercial independence. Whilst traditional face-to-face education may provide greater networking opportunities, it may also potentially limit the access and participation of professionals working outside of major cities. With the consistent improvements in ICT there are now options to supplement or replace these face-to-face activities with on-line learning i.e. e-Learning. Online learning activities, such as live streaming and recording of webinars, enable societies to reach out to colleagues who otherwise may not be able to participate. In addition, an important aspect of on-line education is its potential to eliminate or minimise the duplication of activities and provide a broader and more comprehensive approach to continuing professional development.

"The International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) is a worldwide, non-political organisation for clinical chemistry and laboratory medicine". In 2012 the IFCC endorsed

**Figure 2** Seven learning strategies for ongoing education in the blended learning model




***Lectures, reading and audio-visual*** *are key activities that can be incorporated into e-Learning.*

***Demonstrations*** *are categorised as face to face training, however they may also be incorporated into audio-visual e-Learning.*

***Discussions*** *and practicals are often best delivered face to face, although there are some examples of applying these to e-Learning.*

*Finally,* ***teaching by any of these six methods*** *provides an effective learning approach; hence learners should be encouraged to contribute to professional development activities.*

two committees (one to develop education material and the other to implement the ICT strategy) to work collaboratively for the new IFCC e-Academy. The "IFCC e-Academy is an open educational resource created and/or reviewed by IFCC experts for the continuous professional development of members of IFCC member organisations" globally [6]. This e-Learning resource has a focus to support the national professional societies that do not already have an established on-going education framework; this equates to focused support for developing economies.

The timeline and overall development of the IFCC e-Academy can generally be surmised as the following: 2011 plan by the IFCC and development of the terms of reference; 2012 committees were formed and first meetings conducted; 2013 was the development, distribution to member societies and review of a questionnaire; 2014 material was sourced, and website, copyrights and gaps reviewed; 2015 the pilot e-Academy module was launched [7]; 2016 saw the review, improvement and expansion of e-Academy content; and 2017 has involved finalising the curriculum and mapping content to the curriculum. Although there is still work to be done, there are already significant demonstrated advantages of the e-Academy, including that the material is free open access and obtained from resources worldwide. In addition, this resource is not static and will provide interactive links in the medium term.

## RECOMMENDATIONS

Continuing professional development is important for medical quality. Edwards Deming is a globally recognised champion of quality who implemented Deming's management improvement cycle to provide a mechanism to move forward within a quality framework. Deming's simple *"Plan-Do-Check-Act"* (PDCA), also known as *"Plan-Do-Study-Act"*, approach has been used and updated since its inception, but the underlying approach is still applicable to project management today [8]. The PDCA cycle process can be directly related to the concept of continuous improvement, which in turn can be related to continuous learning throughout our careers. As such the PDCA cycle can be directly applied to learning and to the development of an e-Learning strategy.

Plan-do-check-act is considered a cyclical process that provides a mechanism to efficiently utilise resources and implement in stages. It is akin to the lean start-up methodology whereby a minimum viable product (MVP) is developed then subjected to testing to validate its usefulness. The learning's from this process are then utilised to improve its effectiveness and develop other products or features of value. Unwanted features and items not aligned to the mission statement are to be discarded or at least "parked" for future review. In applying this methodology to e-Learning the focus must remain on the establishment of a valued and credible point of learning.

The initial PDCA cycle to apply to an e-Learning strategy could involve the following:

### *Plan*

Create a committee that engages both local and regional stakeholders, ensuring the people nominated comprise a variety of skill sets. Establish a communication system for the committee to discuss activities between official meetings. The committee and/or people forming the committee should develop a terms of reference (TOR) to guide the committee's activities. It is important to understand and work within any ICT limitations – these may be different for various parts of the country. Once these are understood, then proceed to investigate what is already available; i.e. there is no need to "*reinvent the wheel*". From this a vision can be synthesized and framed into a mission statement as an established point of reference for ongoing planning and decisions.

### *Do*

Find and utilise resources to build the e-Learning platform. A website, establishes the connection to the intended customers of the endeavour. The website should target only the main objectives and provide only the minimum content consistent with the mission statement yet allow for expansion or evolution to a new platform at a later date. This activity establishes the fundamental building blocks.

### *Check*

All stakeholders engaged in the development of the terms of reference should be encouraged to interact with the website as a process of validating the result of the initial endeavour against the mission statement. This engagement process should stimulate great contribution and discussion as to the content and priority which should be established.

In addition, the development and distribution of a questionnaire of needs should be a priority; later review questionnaires can also be used to see what people think about the success of the activity. The de-identified results of the questionnaire/s should be reviewed by the committee to:

1. look for opportunities for improvement; and
2. summarise and share back to stakeholders.

This primary information can be used to develop a pilot education strategy, e.g. one topic, should be developed and trialled. Recording (i.e. documenting) and analysis of this feedback should guide the next steps.

### *Act*

The "act" will be to roll-out the e-Learning strategy. In preparation for the "role out" of the e-Learning approach, ideally the following should also be in place:

1. web page that is low tech;
2. central office;
3. regular management meetings; and
4. on-going planning.

Laying out the curriculum, prioritising the content development and establishing key roles for the ongoing maintenance and updating the web page should suffice for the initial iteration of the PDCA cycle for establishing e-learning.

Individual learning styles and strategies should be considered throughout the cycles to ensure the developed e-Learning model for on-going education is effective.

After the launch of your e-Learning initiative it is still necessary to perform an on-going review and have or develop a plan to expand to other regions. In these later cycles activities can be reviewed by:

1. asking people what worked well and what needs improvements;
2. drilling down to the root cause of any problems;
3. reviewing and refining the plan;
4. identifying gaps; and
5. deciding if more pilots are needed.

Finally, the success of the e-Learning project will also depend on the self-motivation of individuals to study effectively and therefore the creation of a reward system should be considered to support participant motivation.

There are some important general points to avoid in the development of the-Learning strategy:

1. Do not make the plan overly complicated;
2. Don't be afraid to receive feedback;
3. Do not limit it to one type of activity;
4. Don't make the committee too large and ensure members are activity participating - this can usually be achieved through the

development of committee rules related to structure, expectations and length of membership;

5. The final don't is – do not reinvent the wheel i.e. if the relevant e-Learning information is already freely available make use of it e.g. the IFCC e-Academy.

### *Relationship to WHO eHealth*

In relation to the World Health Organization's e-Health plan there are many synergies that could be adapted across to e-Learning [9]. An outline of the WHO strategy adapted to e-Learning is generally concordant with the suggested PDCA approach as it includes:

1. identifying and engaging with the key stakeholders who will need to be involved in the development of the e-Learning vision and plan and its subsequent implementation;
2. establishing a governance mechanism to provide improved visibility, coordination and control;
3. establishing the strategic context to enable the Ministry of Health and Sport to assess and make informed decisions on whether to pursue opportunities that present themselves from the ICT industry and other stakeholders; and
4. assessing the current e-Learning environment in terms of the components that already exist as well as existing programmes or projects that will deliver on-going education.

### *Summary*

In summary, the development and implementation of an e-Learning program will take planning and courage: clear communication, observation via pilot studies, working within the uncertainty of ICT, reviewing strategies, asking questions of the intended students, and development of guidelines or terms of reference and evaluation of the success against the criteria developed. In these respects, the Myanmar Academy of Medical Science is well placed to lead the development and implementation of e-Learning.

## FINAL THOUGHTS

Education is about creating opportunities and a significant driver for on-going education is passion. In the opening address for the Myanmar National Education Strategic Plan 2016 – 2021, Aung Sun Suu Kyi stated "all the leading implementers who set up policies and teachers must encourage the desire to learn mindset, and they themselves need to have **the desire to learn** in order to be able to spread the sentiment widely" [10]. Supporting the implementation and overall success of e-Learning for ongoing professional development in Medical Science requires this commitment and desire for life-long learning at all levels.

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## REFERENCES

1. Article 28, Convention on the Rights of the Child, 1989. http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx. Accessed 26th March 2017.

2. International Standard. ISO 15189:2012. Medical laboratories — Requirements for quality and competence.

3. http://www.nwlink.com/~donclark/hrd/styles/vakt.html. Accessed 5th April 2017.

4. https://www.google.com.au/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=what+is+e+learning&*. Accessed 20th February 2017.

5. Google search (www.google.com.au) " what is e Learning ?" returned 44,800,000 in 35 seconds on 14th February 2017 and 60,900,000 in 60 seconds on 26th March 2017.

6. http://eacademy.ifcc.org/. Accessed 26th March 2017.

7. Greaves RF, Grant J, Smith JM, Vervaart PP. Developing of online content: the mass spectrometry module. Symposium Abstract – IFCC EuroMedLab Paris 2015, 21-25 June 2015 • Clin Chem Lab Med 2015; 53, Special Suppl, p S42. DOI 10.1515/cclm-2015-5001.

8. https://blog.deming.org/2015/05/the-history-and-evolution-of-the-pdsa-cycle/. Accessed 20th February 2017.

9. World Health Organization National eHealth Strategy Toolkit. http://www.who.int/ehealth/publications/overview.pdf. Accessed 26th March 2017.

10. Aung Sun Suu Kyi. Speech to the Opening ceremony of Myanmar National Education Strategic Plan 2016 – 2021. Held 23rd Feb 2017, Myanmar International Convention Centre - Nay Pyi Taw. Report - The Global New Light of Myanmar 24th Feb 2017.