Models for implementing continuing professional development programs in low-resource countries [version 1]

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Abstract
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Implementing CPD programs for medical professionals has been demonstrated to improve patient outcomes, and is increasingly required for continuing medical licensure. However, implementing programs in low-resource settings is challenging. This review has identified 5 different models for implementation: 1) twinning, 2) greenfield, 3) formal program guided by international medical bodies, 4) directed by regulators and 5) informal program guided by international medical bodies. The models, advantages and disadvantages and costs are discussed. There is minimal evidence on success of implementation models, and further studies are necessary.

Keywords
Continuing medical education, Continuing professional development, Twinning, Low-resource
Models for implementing continuing professional development programs in low-resource countries

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Categories: Medical Education (General), Continuing

Abstract

Implementing CPD programs for medical professionals has been demonstrated to improve patient outcomes, and is increasingly required for continuing medical licensure. However, implementing programs in low-resource settings is challenging. This review has identified 5 different models for implementation: 1) twinning, 2) greenfield, 3) formal program guided by international medical bodies, 4) directed by regulators and 5) informal program guided by international medical bodies. The models, advantages and disadvantages and costs are discussed. There is minimal evidence on success of implementation models, and further studies are necessary.

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Introduction

Continuing Professional Development (CPD) is the means by which members of the medical profession maintain, develop, update and enhance their knowledge, skills and performance to ensure that they deliver appropriate and safe care (Medical Board of Australia, 2016). CPD is a documented, practice-based and self-directed process, includes reflective learning, typically surgical audit and development goals, and incorporates both formal and informal learning (Davis et al, 2008, Filipe et al, 2014). Performing CPD has been shown to be effective in improving physician performance (Mazmanian and Davis, 2002) and patient outcomes, and is related to patient safety (Teasdale, 2002). Demonstration of CPD is increasingly required for revalidation/recertification for maintenance of professional licensure in high resource, and more recently in low resource countries (Miller et al, 2008; Archer et al, 2015).
Low resource countries typically have limited funds to cover health care costs leading to limited access to equipment, less-developed infrastructure and fewer trained personnel (Hudspeth et al., 2015). These factors result in many additional challenges in establishing CPD programs. Similar challenges exist in implementing CPD in other low-resource settings such as remote and rural locations in developed countries (Estrada et al., 2011).

This review has identified five models for implementing CPD programs in low-resource settings: twinning, greenfield, formal programs guided by international medical bodies, directed by regulators and informal programs guided by international medical bodies (Table 1). Other than regulatory directed, the models are not mutually exclusive. The models are discussed in terms of advantages, disadvantages and costs to partner organizations. This review focuses on high level program design and implementation, and excludes methods of CPD material delivery.

General principles of CPD program implementation in low-resource countries

This is well reviewed by Giri et al (2010) who note the low evidence base regarding implementing CPD programs. Their general principles are summarized in Figure 1. Their key observations are that CPD programs and supporting activities will be ineffective if CPD is irrelevant to health workers’ practice setting, attended only because participants receive per diem, geared towards improving a skill for which there is no demonstrated need, and taken only to meet regulatory requirements rather than to close a competency gap. An evolving consensus is that adequate internet access is a critical component as well.

Models for implementing CPD in low-resource countries

1. Twinning

Global health partnerships are a well-established method of improving clinical skills in low resource countries (Crisp, 2007, Collins et al., 2015), particularly surgical skills in Africa (Lipnick et al., 2013). This model is promoted by the World Health Organization/World Federation of Medical Education (2009). Examples of established global programs include the Medical Education Partnership Initiative (www.mepinetwork.org) and the Vision2020 Links Programme (http://iceh.lshtm.ac.uk/vision-2020-links-programme).

Twinning is a specific partnership which directly pairs organizations in low-resource and high-resource countries, and designs and implements projects based on needs identified by the low-resource partner. The first examples of twinning used to design and implement CPD programs are continuing education for nurses in Bangladesh (Tyer-Viola et al., 2013, physicians in Laos (Yoon, et al 2016) and ophthalmologists in Cambodia (Mack et al., 2017). CPD in Cambodia was implemented through partnership between the Cambodian Ophthalmological Society (COS) and the Royal Australian and New Zealand College of Ophthalmologists (RANZCO). The COS-RANZCO partnership was designed as a two-year project to improve capacity in Cambodia, with the CPD program continuing independently after its completion. Twinning is typically funded by the high-resource country, directly by the high-resource partner medical institution, or indirectly by not-for-profit medical or educational agencies or government bodies. In some cases participants may bear part of the cost, for example Bangladeshi nurses (Tyer-Viola et al, 2013).

Advantages of twinning are that the CPD program benefits from the educational strength of the high-resource partner, while being specific for the needs of the low-resource country in which it is being implemented. The cost to the low-resource partner is minimized. The Cambodian CPD program required an unanticipated upgrade of the COS
server and employment of an additional staff member, which was borne by the COS and the Australian Government Department of Trade through the East Asia Vision program. The cost to RANZCO, the high-resource partner, has been estimated at about $100,000 AUD over the two-year program period and comprised 0.5 full-time equivalent RANZCO staff member, and teaching trips to Cambodia by the Australian and New Zealand-based faculty on a voluntary basis.

Successful twinning projects require buy-in by the low-resource country partner, and adequate time for capacity building so that the program may continue independently after withdrawal of the high-resource partner, good internet access and finally, but critically, an appropriate regulatory environment. In Cambodia, two years was insufficient time to develop independent capacity, and performance of CPD was not a requirement for ongoing medical licensure. A follow-on period of limited support, likely to be two or more years, and CPD requirement for licensure are key components of a successful and enduring twinning program.

2. Greenfield

A greenfield CPD program begins with a blank sheet of paper. The project is led by a medical professional body. Collaborating with stakeholders, the concept of CPD, the competencies required by professionals in the field, curriculum, plan for required activities and implementation plan are developed. An example is the development of CPD for nurses in Lesotho, directed by national nursing leadership (Moetsana-Poka et al., 2014). Although not a low-resource country, the RANZCO CPD program was designed by one of the authors (HGM) in 2008 using a greenfield approach. A greenfield CPD project is typically funded by the low-resource country, although seed funding may be contributed by international agencies.

The main advantage of a greenfield CPD program is that it is specific to the needs of the country in which it is developed. Working closely with stakeholders enables all regulatory hurdles to be met. Disadvantages include the need for high level educational expertise (which the professional body may not have), and relatively high cost to the low-income country. Moetsana-Poka et al note that the process needs to be staged and includes constant monitoring, evaluation and revision. Buy-in by individual practitioners is necessary for ongoing program success.

3. Formal program guided by an international medical body

CPD programs designed by international medical bodies are typically based on specialist medical disciplines. The best example is the CPD program designed by the International Council of Ophthalmology (ICO, www.icoph.org) a member-based organization that includes about 100 national ophthalmological societies and 40 international subspecialty societies. The ICO collaborates with the World Health Organization, the International Agency for the Prevention of Blindness and international non-government organizations. A similar program is run by the World Federation of Neurology for Latin America (Medina and Munsat, 2010).

In this model the ICO has developed a curriculum (Zagorski 2006) and recording template for ophthalmology CPD. These are intended to be contextualized for each country in which the CPD program is implemented. CPD program directors are supported by a series of Ophthalmic Educators meetings offered annually in low-resource countries, and by an on-line Center for Ophthalmic Educators (https://educators.icoph.org). A CPD handbook has been developed for program directors and participants and covers concepts of CPD and the perspectives of participants, educators, providers and regulators (Filipe et al., 2015). The ICO has also developed content for CPD programs, available on-line and in multiple languages. The ICO is a not-for-profit organization incorporated in Switzerland and is funded by member societies (dues paid weighted by country income), income from running bi-annual World Ophthalmology Congress scientific meetings, and the ICO Foundation. All CPD material is available for free to member societies, with the intention of minimizing cost to low-income country societies using the material.
Advantages of this model are that it can be customized to the needs of the country, that it specifically relates to the competencies required by practitioners in the subspecialty discipline and that the cost to the low-income country is minimized. Extensive support mechanisms are available to CPD program directors. A disadvantage is that implementing the program requires internet access.

4. Directed by regulators

A CPD program directed by regulators is designed and implemented by regulatory bodies. Stakeholders including practicing health professionals, professional societies and university medical schools/medical educators may not be consulted. A good example is mandatory Maintenance of Certification in ophthalmology in the USA, which is effectively directed by the American Board of Ophthalmology (www.abop.org) and the Accreditation Council for Continuing Medical Education (www.accreditation.org) using the points system of the American Medical Association (American Medical Association, 2010). The US ophthalmology professional society (American Academy of Ophthalmology, www.aao.org) functions to supply ophthalmologists with CPD material, much of which is tailored to the requirements of the regulators. Similarly, UK revalidation, which requires structured CPD activities, has been designed and is implemented by the General Medical Council (www.gmc-uk.org/doctors/revalidation.asp).

The main advantage of the regulatory model is that the CPD program meets regulatory requirements by definition. Some argue that a regulatory framework increases legitimacy of CPD. Disadvantages include 1) Lack of control by medical professionals. The program may not emphasize key competencies for medical professionals in general, or for specific craft groups such as ophthalmology. 2) Cost. This is likely to be the most expensive model for designing and implementing CPD programs because in many instances it requires infrastructure for one or more regulatory bodies. External funders are unlikely to contribute funds to regulators. 3) Effectiveness. There is no evidence that programs controlled by regulators are more effective than those controlled by medical professionals. 4) Risk of excessive and time-consuming bureaucratic processes. For example, in the UK doctors under investigation have been reported to commit suicide due to lack of timely processes by the General Medical Council (Horsfall, 2014). 5) Risk of politicization of CPD. Grant and Zilling (2015) argue that this has already occurred in the European Union (EU) with release of an EU Directive on CPD (2013).

5. Informal program guided by an international medical body

CPD is recognized as having both formal and informal activities such as spontaneous interactions with colleagues and reflections on one’s own experiences. Informal internet-based opportunities for learning were described by McNamara et al in 2007. A good example of an informal program guided by an international medical body is HIV/AIDS continuing education in Africa created by the Institute of Tropical Medicine, Antwerp, Belgium (Zolfo et al, 2006). The Internet-based program aims to improve education by provision of guidelines, case studies, frequently-asked questions, useful links and interactive quizzes (http://telemedicine.itg.be). The program does not have formal recording of activities or assessment, but is driven by user requests for information. Another example is RANZCO hosting on-line ongoing education with the Pacific Eye-Care Society (PacEYES), a regional eyecare professional membership organization in the South Pacific (www.paceyes.org). Consistent informal feedback from PacEYES members speaks to the value of such an informal peer to peer network. Advantages of this model are that it is inexpensive, requiring only internet-access and digital cameras, and able to reach a large number of participants even in very remote areas. Internet based CPD has been shown to be effective, compared to no intervention (Cook et al, 2008; Casebeer et al, 2010). Hosting of the website allows use of IT resources of the high-resource host country as an in-kind donation. Content of the website is partly determined by needs analysis of participants. Disadvantages are that it may be limited in scope and not a systematic program across all the competencies required by a medical professional group (e.g. HIV/AIDS only, and not the full breadth of Infectious diseases) and may not include audits.
of patient outcomes.

Challenges in implementing CPD in low-resource settings

Irrespective of the implementation model there are many challenges in implementing CPD programs in low-resource countries. All programs must be underpinned by ethics and best practice guidelines to avoid burdens for low-resource participating countries (Crump et al, 2010). Buy-in by in-country medical professionals and involvement of key opinion leaders are critical for success. Healthcare workers may have a relatively low level of education, and may have difficulty with material presented in non-native language. Cultural barriers may exist in understanding the importance of life-long learning and CPD, and may involve religious and social factors such as in nursing in Bangladesh (Tyer-Viola et al, 2013). Resources are constrained, both financial and infrastructure such as hospital computers and medical records. Adequate internet access is important. Medical societies and regulators may be poorly functioning and not able to effectively participate as stakeholders.

High-resource countries may also have challenges in working with low-resource countries. Resources are often constrained, and partnership with not-for-profit international NGOs may be needed to secure financial support. Many programs rely on volunteers to travel at their own expense to low-resource partner countries. Cultural barriers may be present, and exacerbated by lack of common language.

Opportunities in implementing CPD in low-resource settings

While low-resource countries can gain a functioning CPD program following successful program implementation, high-resource countries can also benefit (Syed et al, 2012). High-resource country participants gain intangible benefits such as increased job satisfaction. Health systems in high resource-countries can learn from low resource country innovations including providing services to remote areas, skills substitution, decentralization of management, innovation in mobile phone use and low technology simulation training. The interaction between high and low resource countries can be considered a form of open innovation (Dandonoli, 2013).

Conclusions

Many low resource countries seek to develop CPD programs for medical professionals. This review identifies 5 general models of implementing programs. Advantages and disadvantages can be identified, however the scientific evidence base for implementing any form of program is weak. Further studies are necessary to determine optimal methods of implementing CPD programs in low-resource countries.

Figure 1

Figure 1 Basic principles in implementing CPD in developing countries, adapted from Giri et al

Good CPD planning begins with a health education needs assessment.

Principal stakeholders should be involved in formulating the mission and purpose of CPD, as well as the regulatory
Frontline health providers should be involved in system planning and design.

Supervisors and managers should encourage health workers to take advantage of CPD opportunities.

Materials that are of high technical quality but not absorbed or translated into health worker actions are of limited value to the health system.

Appropriate participants must be selected for CPD interventions.

Commercial sponsorship and conflict of interest must be disclosed in the planning of CPD activities.

The best CPD systems are multifaceted and provide different types of formal and informal learning opportunities and support, such as structured courses supported by on-the-job training, mentoring and peer support.

In order to transfer clinical skills, hand-on teaching is more effective than classroom teaching and should be used when feasible.

Adequate internet access is necessary.

### Table 1

#### Models for implementing CPD programs in low-resource countries

| Model | Twinning | Greenfield | Formal program guided by international medical body | Directed by regulators | Informal, telemedicine-based, guided by international medical body |
|-------|----------|------------|---------------------------------------------------|------------------------|---------------------------------------------------------------|
| Example | CPD program for Cambodian ophthalmologists. Partnership between Cambodian Ophthalmological Society and RANZCO (Mack et, 2017) | CPD program for Lesotho nurses (Moetsana-Poka et al, 2014) | CPD program for global ophthalmologists, designed by International Council of Ophthalmology. (www.icoph.org) | MOC examinations in ophthalmology, directed by American Board of Ophthalmology USA in conjunction with the American Medical Association. | Telemedicine support service: for HIV/AIDS healthcare workers in Africa. Hosted by the Institute of Tropical Medicine, Antwerp, Belgium. (Zolfo et al, 2006) |
| Definition | Pairing of one educational organization from a low-resource country with one from a high-resource country to implement a specific medical educational outcome | De novo structured CPD program, designed with stakeholders, including concept of CPD, requirements of program and implementation plan. | Generic structured CPD program designed by international medical body. Intended to be modified prior to implementation by national medical societies prior to implementation. | Structured CPD program designed by national regulatory authorities. | Internet-based program improving education by provision of case studies, frequently-asked questions, and interactive quizzes. |
MOC – Maintenance of Certification

Take Home Messages

Notes On Contributors

Heather G Mack is an Australian ophthalmologist practicing in medical retina and retinal electrophysiology. She is on the board of the Royal Australian and New Zealand College of Ophthalmologists.

Karl C Golnik is the Neuro-ophthalmologist at the Cincinnati Eye Centre, and Director of Education of the International Council of Ophthalmology.

Neil Murray is an ophthalmologist in New Zealand. He is on the board of the Royal Australian and New Zealand College of Ophthalmologists.

Helena P Filipe is a Portuguese ophthalmologist practicing in cornea. She is chair of the Continuing Medical Education committee of the International Council of Ophthalmology.

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Appendices

Declaration of Interest

The author has declared that there are no conflicts of interest.
Michelle McLean  
Bond University  
This review has been migrated. The reviewer awarded 4 stars out of 5  
This is one of the first papers in the Medical Education in Difficult Circumstances to offer solutions, which helps us with closing the loop. It is easy to identify problems, but finding solutions is always the problems. The summary you have provided is a useful start towards addressing the problem. As has been pointed out by some of my colleagues' reviews, these models involve outside parties and so there is always the question of sustainability. Developing home-grown capacity is therefore important,

*Competing Interests:* No conflicts of interest were disclosed.

Trudie Roberts  
Leeds Institute of Medical Education  
This review has been migrated. The reviewer awarded 3 stars out of 5  
I really enjoyed reading this and think it was an interesting paper for all those involved in Faculty development not only in low resource countries. As others have commented it would be good to know about sustainability and the appropriateness of the model for particular situations and even if at different
times in the evolution of an institution different models might be appropriate. Perhaps staff involved in some of the examples given could write about their own programme and directly address the issue of sustainability

**Competing Interests:** No conflicts of interest were disclosed.

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Trevor Gibbs
AMEE

This review has been migrated. The reviewer awarded 4 stars out of 5

I enjoyed reading this paper and thought that it gave some very good ideas to those involved in developing CPD programmes. The more one travels around reviewing medical educational programmes or reads about medical education in other countries, it is still very surprising to detect the weakness in many CPD programmes, specifically about purpose. Many working practitioners see CPD far too often as a burden that should be done as quickly as possible and with as little effort as possible. The paper presented, very clearly, five very acceptable approaches, all of which would work and from which countries could choose. However, I think I would have liked to have seen a little further clarity on if one approach was better than another and also a little bit more on which brings out the motivation in the participant. Far too often CPD programmes are purposeful in only one particular area and their translation into practice far from obvious- participants in programmes need to know that their work in such programmes will have outcomes, will reward them in a clinical sense and reward their community in medico-social sense, I do feel that this paper will help those those involved in CPD programming but I hope that it can be expanded into addressing some of these motivational issues

**Competing Interests:** No conflicts of interest were disclosed.

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Richard Hays  
James Cook University

This review has been migrated. The reviewer awarded 3 stars out of 5

This is an interesting paper that describes clearly five different models of helping low resource countries enhance health care through CPD programs. What may be missing is an analysis of what works best, although measuring success can be difficult. My observation of several cases of support - hence only weak evidence - is that sustainability is enhanced through longer term arrangements and a clear emphasis from the outset on transfer of skills and knowledge (sometimes also equipment) to people in the low resource settings. While it can be rewarding for all concerned when an outsider helps during visits, caution is needed to avoid dependency on visitors and distant institutions, even when this is not the intention. There is a risk that locals are trained to the point where they feel they have to leave to pursue certain careers that are not sustainable unless the resources are provided locally. I would welcome the authors thoughts on the issue of sustainability.

**Competing Interests:** No conflicts of interest were disclosed.