



Project-based faculty development for e-learning

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SUMMARY

Background: The Christian Medical College, Vellore, in collaboration with Tufts University, Boston, conducted an advanced workshop in e-learning for medical faculty members in India.

Context: E-learning can enhance educational reforms for today's computer-literate generation, and keep faculty members up to speed in a rapidly changing world. The purpose of this paper is to report on the design and evaluation of a project-based faculty member development programme focused on developing faculty members as educators and as peer trainers who can use

e-learning for educational reforms.

Innovation: During a 2-day workshop, 29 participants in groups of two or three developed 13 e-learning projects for implementation in their institutions. Evaluation of the workshop was through written feedback from the participants at the end of the workshop and by telephone interview with one participant from each project group at the end of one year. Content analysis of qualitative data was performed. The participants reported that they were motivated to implement e-learning projects and recognised the need for and usefulness of

e-learning. The majority of projects (10 out of 13) that were implemented 'to some extent' or 'to a great extent' faced challenges with a lack of resources and administrative support, but faculty members were able to overcome them.

Implications: Designing feasible e-learning projects in small groups and obtaining hands-on experience with e-learning tools enhance the effectiveness of subsequent implementation. To successfully incorporate e-learning when designing educational reforms, faculty member training, continuing support and infrastructure facilities are essential.

E-learning can enhance educational reforms for today's computer-literate generation

Many challenges remain in using it [e-learning] for educational reform, especially in resource-constrained settings

INTRODUCTION

E-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance.¹ The Christian Medical College (CMC), Vellore, with the help of Tufts University (Tufts), Boston, has used a locally relevant, flexible and reusable learning management system to create digital resources to support curricular reforms.² CMC in collaboration with Tufts conducted workshops on e-learning during the National Conference on Health Professions Education in 2011. Based on participants' feedback and requests, CMC in collaboration with Tufts conducted a follow-up advanced workshop in e-learning for medical faculty members.

CONTEXT

E-learning can enhance educational reform for today's computer-literate generation.³ Some uses of e-learning include increased accessibility to information, ease in updating content, learning on the go and just-in-time information.¹⁻⁴ It keeps faculty members up to speed in a rapidly changing world. Evaluation is critical to show the effectiveness of such innovations in e-learning.^{1,2} Although there is a growing body of evidence of the benefits of e-learning,^{1,3,4} many challenges remain in using it for educational reform, especially in resource-constrained settings.⁵ Faculty member development that uses e-learning for educational reform is essential for successful incorporation within medical schools.¹ There is limited literature on faculty member development that uses e-learning to bring about educational reforms in medical colleges.¹

Faculty member development programmes have used projects for enhancing the learning experience of the participants;⁶ however, these projects focus on

developing faculty members as educators.^{6,7} We did not find any data on projects in which medical faculty members use e-learning for educational reforms in resource-constrained settings.

The purpose of this paper is to report the design and evaluation of a project-based faculty member development programme that used e-learning to bring about educational reforms in medical colleges in India. The paper also explores what kind of challenges faculty members faced in designing and implementing e-learning, and how they overcame the challenges.

INNOVATION

Design of the workshop

The Medical Council of India (MCI) had been advocating for medical education reform nationally to raise the overall standards of the burgeoning number of medical schools. One strategy of the MCI was to designate 20 medical schools as regional centres, with the CMC being one of them, in order to assist the other schools in the region with reform efforts, thereby improving the overall quality of medical education nationally through regional collaborations. The e-learning workshop was offered to CMC's regional schools with this background in mind, with CMC sharing its expertise in e-learning to support nascent curricular reform efforts by faculty members who were delivering traditional curricula with limited prior exposure to e-learning.

A 2-day workshop was designed with the purpose of guiding participants through the process of developing a curricular project in e-learning for implementation in their institutions. Twenty-nine participants, in groups of two or three, from 13 medical colleges across India designed 13 e-learning projects during the workshop. The list of the e-learning projects designed

by the participants is provided in Table 1.

The novelty was in having participants come to the workshop in institutional groups to outline an e-learning curricular project that they had self-identified as stemming from issues in their own curriculum that they wished to address. The project work was solicited via e-mail prior to the workshop; feedback was provided during the workshop on how to refine the projects for a higher likelihood of success, and workshop tasks and skills were designed to help the teams to develop their projects. Institutional group members would act as resources for one another during the workshop, and on return to their home institution, and importantly were more likely to maintain the momentum to implement the project, and would also ensure better continuity if one participant was later pulled away from the project. The workshop was interactive, based on group activities, presentations of the curricular projects in e-learning and discussions. The key characteristics of the workshop are summarised in Table 2.

Evaluation of the workshop

The evaluation of the workshop focused on the following three areas.

1. The participants gave written feedback at the end of the workshop on what worked well for them, and why, what did not work so well, and why, and the key take-away message.
2. One year after the workshop, telephone interviews were conducted with one participant from each of the 12 groups to determine the status of implementation of each project. The 13th group could not be contacted. The telephone interview was semi-directed and was of 30 minutes duration. Written recordings of the interview data were made.

Table 1. List of e-learning projects implemented by participants of the workshop on e-learning

No.	Project
1	To teach students to write rational prescriptions using e-learning
2	Case discussion on chronic liver disorder and assessment using e-learning
3	Under-the-belt issues in young boys Purpose: At the end of the session, the undergraduate student will be assessed on his or her ability to manage a child with undescended testis/inguinal hernia and hydrocele using e-learning
4	Distance education for general practitioners through e-learning
5	Integrated e-learning module (teaching–learning module)
6	Teaching of histology of cartilage using e-learning
7	To enable junior doctors in the emergency room to diagnose impending compartment syndrome <i>Changed to: Developing SAFE5 – infection control self-learning modules for nurses and junior consultants</i>
8	Pre-exam stress reduction using e-learning <i>Changed to: e-learning – counselling patients for infertility</i>
9	Developing a teaching–learning module in evidence-based medicine using e-learning
10	Video recording of neuropharmacology – self-learning module <i>Changed to: Integrated e-learning module in diabetes for first-year medical students</i>
11	E-learning teaching module for postgraduate students in radiation oncology
12	Teach gram staining using e-learning
13	Video-assisted lecture for teaching family health survey, with special reference to environmental assessment

3. The interview also explored the challenges the participants faced in the design and implementation of the e-learning project, how they overcame the challenges, and their future plans.

Data analysis

Two of the authors independently analysed the data from the participants’ written feedback at the end of the workshop, and from the written recordings of the telephone interview. Content analysis of all comments was carried out. Themes in the comments were identified and coded, and comments were assigned to themes.⁸ The inter-rater reliability of identified themes, and comments assigned to the themes, were calculated using Miles and

Huberman’s formula.⁹ To ensure the trustworthiness of the qualitative data analysis, we carried out triangulation, thick description, member check and an audit trail.^{9,10}

The two authors who were reviewers for the analysis of the qualitative data had 100% agreement after discussion on the themes and comments assigned to the themes.

Content analysis of feedback from the participants at the end of the workshop

Content analysis of the feedback is described in Table 3. The main responses for ‘What is the key message that you will take away’ were: motivated to implement e-learning projects in home

institutions; recognise the need for and usefulness of e-learning; and identified the factors contributing to the success of e-learning projects.

Content analysis of the data from the telephone interview of the participants 1 year after the workshop

The analysed data are described in Table 4 and summarised below.

One project could not be implemented because the challenges faced (a lack of resources and administrative support) could not be overcome. The majority of projects (10 out of 13 projects) that were implemented ‘to some extent’ or ‘to a great extent’ also faced challenges of a lack of resources and administrative support; however, they were able to overcome them by involving administrators and faculty members as stakeholders, completing smaller components of the project or expanding their project to other topics. Working in teams enabled them to offer support to each other in overcoming the challenges. Two of the teams changed their planned e-learning project because of a lack of resources. The future plans included continuing to work on various components of the project, expanding it to other topics and evaluating the projects.

One project group that was able to implement their project to a great extent said that they had administrative and infrastructure support to implement their project, and to sustain it.

IMPLICATIONS

The impact of e-learning in medical education is well recognised.¹ One of the important components for successful implementation of e-learning is faculty member development.¹ Our innovative faculty member development workshop combined institution-based team processes and e-learning project

One of the important components for successful implementation of e-learning is faculty member development

Feedback was provided during the workshop on how to refine the projects for a higher likelihood of success

Table 2. Key characteristics of the faculty member development workshop on e-learning

Purpose of the workshop	To help participants develop a curricular project using e-learning for implementation in their institutions
Duration of the workshop	2 days
Number of participant teams from medical colleges across India	13
Number of participants	29
Number of e-learning projects designed	13
Process used in the workshop	<ul style="list-style-type: none"> • Interactive presentations • Small-group activities • Team presentations • Discussions • Formative feedback
Pre-workshop assignment for participants: To come prepared with an e-learning curricular project in small teams (of between two and four) so that they could:	
<ul style="list-style-type: none"> • be resources to one another when they returned to their institution • better ensure continuity if one participant was pulled away from the project 	
The e-learning curricular project should be:	
<ul style="list-style-type: none"> • important to them, and • address an identified problem/need from their own curriculum 	
Structure of the process of project work	
<ul style="list-style-type: none"> • The project work was solicited via e-mail prior to the workshop; • Feedback was provided during the workshop on how to refine the projects for a higher likelihood of success; • Workshop tasks/skills were designed to help the teams develop their projects. Although a 'survey' of overall tools was provided, the participant mini-teams were constantly reminded to select what was most relevant for them; • The high faculty member to team ratio (1 : 2) enabled faculty members to circulate among the teams throughout the workshop to ensure that each team was identifying and applying the most useful tools to their project; • Because the projects needed to be locally relevant, they ranged from fairly specific to quite broad. Prior experience of the faculty members suggested that the more specific projects would have a higher likelihood of completion, so that participants with the more general projects were encouraged to narrow their focus during the course of the workshop. 	

design methods to plan locally relevant educational reforms. The 1-year follow-up demonstrated that the majority of the participants were able to implement e-learning in their institution, even in resource-constrained settings. The hands-on processes used in developing their e-learning projects plus the key take-home messages of the workshop prepared the participants to face challenges in implementation, and to overcome the challenges. One of the major strengths of the workshop was that the

participants, in institution-based groups of two or three, developed e-learning projects that were in areas of interest for them, and that responded to an identified local need. This helped almost all of them to successfully implement e-learning projects in their institution, demonstrating the power of collaboration, teamwork and responding to an identified need.

Although one out of the 13 projects could not be carried out, one was fully implemented. The

other teams covered the range in between these two, both in the level of support and the degree of project completion, reinforcing the point that, in addition to faculty member development, the successful implementation of e-learning curricular reforms benefit from clear administrative support and resources.

A limitation of the study was that it did not explore the outcomes from implementation of the projects. Further evaluation studies are required to look into

Table 3. Content analysis of feedback questionnaire administered to the participants at the end of the workshop on e-learning

	Theme	Example of Comments
Q1 What worked well and why?		
1	Content of the e-learning workshop (<i>n</i> = 15/29) <i>It was presented in a simple and clear manner with good explanation providing knowledge and good exposure to e-learning</i>	The presentations were simple enough for a beginner to learn and understand
2	Design of the workshop and using projects as tools for learning (<i>n</i> = 15/29) <i>This provided opportunities for active participation and hands-on training</i>	The participants really participated in learning, planning, sharing of ideas and developing projects
3	Well organised e-learning workshop (<i>n</i> = 13/29)	Time management, venue, food, everything excellent
4	Support and teamwork of faculty members and technical staff (<i>n</i> = 6/29)	Good support from the facilitators and MEU members, good teamwork
Q2 What did not work so well and why?		
1.	Include other software/simulations in addition to TUSK (<i>n</i> = 4/29)	I expected to learn how simulations-based software can be made/tested, example pelvic trainer
2	More group activities (<i>n</i> = 4/29)	Some more group task to exchange ideas.
Q3 What is the key message/point that you will take away		
1	Motivated to implement e-learning projects in home institution (<i>n</i> = 11/29)	It is possible to implement e-learning techniques in home institutions
2	Recognise the need for and usefulness of e-learning (<i>n</i> = 10/29)	e-learning as a tool can supplement and facilitate e-learning and can be used to overcome today's problems when implemented strategically
3	Identified the factors contributing to the success of e-learning projects (<i>n</i> = 10/29)	Meticulous planning paves the way to making an e-learning project successful

TUSK = Tufts University Sciences Knowledgebase; MEU = Medical Education Unit.

Table 4. Content analysis of the interviews of participants conducted 1 year after the workshop on e-learning

Status of implementation of e-learning projects	Challenges faced	How were challenges overcome	Future plans
Not at all/to a little extent (<i>n</i> = 1/13 project groups)	Lack of resources and administrative support	Difficult to overcome (<i>n</i> = 1/1)	
To some extent/to a great extent (<i>n</i> = 10/13 project groups)	Theme 1: lack of resources (<i>n</i> = 7/10)	Theme 1: involving administrators and faculty members as stakeholders (<i>n</i> = 3/10)	Theme 1: continue working on various components of the project (<i>n</i> = 6/10)
	Theme 2: lack of administrative support (<i>n</i> = 3/10)	Theme 2: various components of the project completed (<i>n</i> = 5/10)	Theme 2: expand it to other topics/areas (<i>n</i> = 3/10)
	–	Theme 3: expanded to other topics (<i>n</i> = 2/10)	Theme 3: plan to evaluate (<i>n</i> = 1/10)
To a very great extent (<i>n</i> = 1/13 project groups)	They had administrative and infrastructure support for implementation of their project and to sustain it (N=1/1)		
Could not be interviewed (<i>n</i> = 1/13 project groups)			

The successful implementation of e-learning curricular reforms benefit from clear administrative support and resources

how the e-learning developments were received by students.

Our approach to faculty member development demonstrated that providing hands-on experience for faculty members when developing e-learning projects, as well as using small institution-based work groups, foster subsequent implementation; however, additional faculty member training, continuing support and infrastructure facilities are essential for the most effective implementation of e-learning. In order to maximise the benefits of e-learning, we recommend project-based faculty member development that uses institution-based teams to design locally relevant e-learning curricular reforms for successful implementation, even in resource-constrained settings.

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