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Cascade Model of Teacher Professional Development: Qualitative Study of the Desirable Characteristics of Secondary Trainers and Role of Primary Trainers

Lucian Vumilia NGEZE*, Ulfa KHWAJA & Sridhar IYER
IDP in Educational Technology, Indian Institute of Technology - Bombay, India
*lucianngeze@iitb.ac.in

Abstract: Teacher professional development (TPD) is needed to improve the quality of teaching processes of teachers. There are many existing models that support TPD, however, training of a large number of teachers at the same time is still a challenge. The cascade model is one of the TPD models that is used to train a large number of in service teachers in a short span of time. This model uses the existing teaching staff as co trainers in the training process. The success or failure of this model depends upon the way it is implemented by these trainers. This paper is a qualitative study of the desirable characteristics required for Secondary Trainers (STs) in a two level cascade model of training. The study was conducted during a 4-week workshop for 154 novice in-service instructors from 6 different technical institutions of India. Findings show that to conduct face to face workshops using cascade model of training, the STs need to participate in sessions conducted by PTs, have rich domain knowledge, prior workshop experience, time management and content ownership skills. This study highlights the role of the PTs in terms of support provided to the STs. It also provides recommendations to implement an effective cascade model.

Keywords: Cascade model, primary trainer, secondary trainer, teacher professional development.

1. Introduction

The teacher professional development (TPD) is one of the essential components to enhance the quality of teaching and learning in schools and colleges (Ingvarson, Meiers, & Beavis, 2005). There is a need to conduct TPD on a large scale to effectively engage a large number of teachers in tasks of teaching and assessment (Darling-Hammond & McLaughlin, 1995). Hence there is an increased research to identify features that lead to effective TPD or Continuous Professional Development (CPD) programs to improve teaching practices.

Teachers in the past have undergone professional development through different models that include Coaching or mentoring on a one-to-one basis (Kennedy, 2005), Co-teaching of two or more teachers to work collaboratively to achieve certain goals (Murphy & Martin, 2015), Deficit model (Kennedy, 2015) used by authorities to address a particular deficit to improve teachers' performance, Community of Practice (CoP) model shaping teacher practices through a social participation process involving communities with similar practices (Wenger, 1998) and Action Research model using teachers as researchers by encouraging reflective inquiry to improve the quality of practices. We chose to use and study the cascade model of professional training since it allowed us to use the existing staff to train a large sample of novice in-service instructors in a short span of time.

The Cascade model of professional training is a top-down model of professional learning where there is a flow of information from 'expert' teachers or Primary Trainers (PTs) to Secondary Trainers (STs) or multipliers at different levels (Abeysena, Philips & Poppit, 2016). Here the STs receive an initial training and skills via a workshop from expert teachers. These STs in turn train other teachers on the lower levels of the hierarchy. This model relies on people to pass on their

newly procured understanding and expertise and also change their roles while receiving and conducting training (Abeysena, Philips & Poppit, 2016). If this is not done systematically, then the system fails and the training is wasted (Abeysena, Philips & Poppit, 2016). Studies have reported that many teachers in Bangladesh (Dove, 1983), China (Wedell, 2005) and in Nepal (Suzuki, 2011) have been successfully trained using this model. This model was also used to train science teachers in the United Kingdom (Morrison, Gott & Ashman, 1989) on how to be innovative in the early years of their school teaching.

Advantages of the cascade model have been reported as the use of existing teaching staff, cost-effectiveness and shorter time spans during training (Engelbrecht, Ankiewicz & Swardt, 2007). However, this model of training is reported to be a one-way transmission of information (McDevitt, 1998), i.e. the content is passed from PTs to STs and then from STs to the target audience without discussions or feedbacks between them. STs have been reported to misinterpret content received from PTs (Suzuki, 2011); lack confidence in conducting the training; and lack sufficient knowledge and understanding to manage the training process (Engelbrecht, Ankiewicz & Swardt, 2007).

To address the above issues, it is important to first have a detailed understanding of the desirable characteristics required for STs. In this paper, a qualitative study of the roles of trainers involved in cascade model of TPD programme has been conducted.

2. Literature Review

TPD reinforces teachers' content knowledge and improves their teaching practices. Coaching model involves one-to-one relationships between an experienced teacher and novice teacher (Kennedy, 2005). This model is more skill based and supports a transmission view of professional development where teachers gain expertise in the specific area by associating themselves with their more experienced colleagues. Co-teaching (Murphy & Martin, 2015) involves two teachers working collaboratively from the start to the end of the programme. This gives an opportunity to them to effectively use their knowledge together and be equally involved in every step of the model. The deficit model (Kennedy, 2005) identifies the areas in which individual teacher needs improvement. The Communities of Practice (CoP) model (Wenger, 1998) states that learning is a social participation of being actively involved in the practice of social communities and constructing activities in relation to these communities. The action research model (Kennedy, 2005) allows the novice teachers to start by learning the skills, observe the skill being demonstrated by experts and practice the skill themselves. This model uses novice and expert teachers as researchers and encourages a reflective inquiry and discussion among them (Norman, Sprinthall, & Thies-Sprinthall, 1996).

The cascade model involves training the trainers who then have to train other trainers. This process is repeated to lower levels until the target group is reached. The first level involves trainers being selected from a pool of teachers based on a certain criteria. These selected STs are then trained by a team of expert training staff, referred to as PTs. The training received via this model takes place in stages and hence the progress can be monitored systematically (Chidaba & Mokhele, 2012).

The cascade model of training has few challenges. Chidaba & Mokhele (2012) and Suzuki (2011) have pointed that, even though the STs have to own the content of the training, there is a misinterpretation of crucial information at lower levels. Moreover, teachers reported difficulties to share the same training to other teachers in different centers (Hayes, 2000). In a study by Engelbrecht, Ankiewicz & Swardt (2007), it was reported that cascade training may result in the dilution of the teaching content as the content moves from the PTs to the lower levels; it is bound to attain multiple modifications from STs to fit their own ways of teaching. Hayes (2000) suggests five measures to increase the effectiveness of the cascaded training model, including making the training experiential, reflective and open to reinterpretation, diffusion of expertise through the system and the inclusion of stakeholders in the preparation of training materials.

The challenges in this model are associated with the characteristics of the STs, the way the training materials are utilized by them and support required from the PTs. This paper highlights the characteristics of STs along with the role of the PTs in at the first two levels of the cascade model.

3. Our Study

3.1 Context

This study was carried out during a 4-week long face to face, teacher training workshop of novice instructors from technical educational institutes in India with the aim of imparting them with pedagogical skills. The novice instructors had completed their post-graduation with less than a month of experience in the teaching field. The sessions on Active Learning (with focus on Peer Instruction (PI)) and Learning Objectives and Formative Assessment were the main focus of this study.

3.1.1 Research Questions

The research questions (RQs) addressed in this study are:

1. What are the desirable characteristics of secondary trainers in a cascade model of training?
2. What is a suitable support that should be provided to secondary trainers by primary trainers for cascade model implementation?

3.1.2 Participants

The participants of this study comprised of 2 PTs and 4 STs and a group of 154 workshop participants. The PTs were expert professors in Educational Technology and STs were Ph.D. research scholars in Educational Technology. The workshop had around 36 to 40 workshop new participants per week.

3.1.3 Procedure

The PTs conducted the sessions on two topics of Learning Objectives and Formative Assessment (Session 1) and Active Learning - PI (Session 2) on the first week. The STs participated in these sessions as the Teaching Assistants (TAs) and maintained logs. Every ST conducted the same session from week 2 onwards while 1 of PTs participated in it as a mentor. Hence, two PTs trained 4 STs, who in turn trained a total of 154 workshop participants. A detailed flow of the roles of trainers displayed per week can be viewed in the Table 1.

Table 1

Roles of the trainers per topic on respective weeks

Weeks	**Week 1 (N=40)**		**Week 2 (N=38)**		**Week 3 (N=36)**		**Week 4 (N=40)**	
	Session 1	**Session 2**	**Session 1**	**Session 2**	**Session 1**	**Session 2**	**Session 1**	**Session 2**
PT 1		Trainer		Mentor		Mentor		Mentor
PT 2	Trainer		Trainer		Mentor		Mentor	
ST 1		TA		Trainer				
ST 2	TA				Trainer		Trainer	
ST 3		TA				Trainer		
ST 4		TA						Trainer

TA = Teaching Assistant; Session 1 = Learning Objectives and Formative Assessment; Session 2 = Active Learning (with focus on Peer Instruction (PI)); and N= number of workshop participants

3.1.4 Data Collection and Instruments

Data in this study were collected through structured interviews with PTs and STs. The interview session with PTs consisted of questions like "What criteria did you consider to select STs?", "What are your comments on the sessions conducted by STs?", "How did you ensure that STs worked in the correct direction in this model?" and so on. The STs were asked questions like "Did you attend such workshops in the past? Can you tell us more about it", "What challenges did you face while conducting the session?", "Did you receive any guidance from PTs?" and more. The questions asked during the interview were reviewed by 2 research scholars from the education domain.

3.1.5 Analysis Techniques

The average time of the interviews of PTs was that of 18 minutes each and that of STs was around 23 minutes. Each of the trainer was interviewed separately, one after the other and there were no discussions among the trainers prior to the interview.

The interviews were audio recorded and transcribed using the oTranscribe application to generate text formats. As a qualitative study, thematic analysis was carried where every transcribed sentence was treated as a unit of analysis for this study. Thematic analysis enabled us to come up with meaningful patterns within data and generate themes out of them (Braun, & Clarke, 2006).

While a formal inter-rater reliability of the thematic analysis was not done, the codes generated were reviewed by one expert researcher working in the field of TPD. This enabled us to remove the risk of misinterpretation or bias. These codes were further categorized into meaningful themes.

4. Results and Discussion

4.1 Characteristics of STs

Themes generated were categorised to give the desirable characteristics of the STs in a cascade model of training. Table 2 gives a detailed explanation of these themes.

Table 2

Themes generated from ST interview

No.	**Theme**	**Meaning**	**Some instances of response from different STs**
A	Knowledge of the content area	The degree of familiarity that the ST has with the content of the workshop	"...I had already been to ET801 class which had Learning Objectives..."
B	Participation in previous workshop	Experience from previous related workshops attended by the ST	"I have attended a lot of workshops conducted… where they train teachers either through face to face or online"
C	Participation during the PT's session	Participation of STs in sessions conducted by PTs	"I went and sat through the first session of PT2 taught for learning objectives…"
D	Content ownership	Modifications made on the workshop content in terms of activities, examples and teaching style	"I looked at slides and... I introduced some activities or connect between the content of the slides" "…I removed the examples which I was not comfortable with..."
F	Time management skills	The skill to manage time during the training sessions conducted by STs	"...I tried to cut it short the content of the Workshop because I knew that I won't be able to do time management successfully..."

As can be seen in Table 3, the theme "Experience from previous workshops", "Content ownership" and "Participation during the sessions by PTs" were mentioned by both PTs and STs. Since all the STs had difficulty managing time during their sessions, they could all identify "Time Management" as an important characteristic. Another essential characteristic that was mentioned by both PTs was "Knowledge of content area", however only 1 ST mentioned it. Table 3 displays the themes generated.

Table 3

Themes generated for the characteristics of STs (N=6)

Trainers	Themes generated				
	Experience from previous workshops	**Knowledge of content area**	**Content ownership**	**Time Management**	**Participation in sessions by PT**
PT1	√	√	√	√	√
PT2	√	√	√	x	√
ST1	√	x	√	√	√
ST2	√	√	√	√	√
ST3	√	x	√	√	√
ST4	√	x	√	√	√

4.2 Roles of PTs

The themes generated from the interview responses of both PTs and STs helped answer the RQ 2.
Assistance in Planning: PTs helped the STs in shaping their modified content before conducting their sessions. STs also stated that the assistance provided before the training session was beneficial. An excerpt is given here: *"...I had a discussion with PT2, PT2 gave me valuable points on how to face teachers, how to convey our ideas…*"
Presence of PTs in the sessions: The PTs were present in the sessions taken up by STs. They helped them in the orchestration process and time management. *"...I also played the role of the TA for the ST so that also when we are ensuring that they were going in the correct direction…"*
Debriefing sessions: All STs agreed that the debriefing sessions with PTs' post workshop sessions helped them receive feedback and suggestions on the content, examples and type of activities to be conducted.

4.3 Recommendations

For a cascade model to be effective in addition to STs having the characteristics like "Experience from past workshops", "Knowledge of content area", "Content ownership", "Time management" and "Participation in workshops undertaken by PTs" the following criteria should be ensured.

1) PTs should make effort to attend some of the sessions taken up by STs;
2) STs should have debriefing sessions with PT after every session; and
3) Discussion among STs to share experiences before and after the sessions

4.4 Limitations

The findings of this study have few limitations. Firstly, all STs had the same background and were research scholars of the same institute which means that the findings may not hold true for trainers of different background. Secondly, observations were limited to only one session per ST during the four-week workshop. Thirdly, only four STs were involved and observed in this study. Results could be different if the number would be more. Finally, the study was limited to only two levels of the cascade model; hence, there could be a variation in claims for more than two levels.

5. Conclusion and Future Work

This study explains the roles of the PTs and the characteristics of STs involved in cascade model of TPD. It was studied that the STs need knowledge of the domain area of training, experience from previous related workshops and they should participate in sessions conducted by PTs. Content ownership, feedback from PTs and time management are other important characteristics inherent to STs. The PTs are involved in the selection of the STs and provide continuous feedback to them. Further studies will look into how the findings from these STs can apply in cascaded training programmes involving more than two levels, with multiple sessions per STs and the integration of technology to train participants.

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