Introduction

This case study describes a project which equipped teacher educators with digital video recorders and laptops as tools to utilize in a 2.5 month teacher training course which was provided in three locations in rural Nepal. The case study examines the impact of the project and discusses whether using these ICT tools was effective in bringing about better learning outcomes among the trainee teachers.

Background

With the aim of providing developing member countries (DMCs) with better guidance to use information and communication technologies (ICT) effectively in education, the Asian Development Bank (ADB) funded a 21-month regional technical assistance (RETA) study in four countries: Bangladesh, Nepal, Mongolia, and Samoa.

The RETA researched approaches to using ICT in education, for improvements in teaching and learning that are not only successful but also feasible and sustainable given the region's development challenges.

The study, titled “Innovative Information and Communication Technology in Education and Its Potential for Reducing Poverty in Asia and the Pacific Region” commenced in April 2006 and was implemented in the four countries by RTI International in partnership with iEARN-USA. Outcomes from the four studies were shared at a regional ICT in education conference in October 2007 at ADB Headquarters in Manila, Philippines.

The study aimed to:

- Explore and highlight promising models of ICT integration and best practices
- Identify drivers and barriers to successful ICT integration
- Share lessons learned, with a specific focus on rural and remote areas.

The study combined policy analysis, programme evaluation (mainly interviews and focus groups), and small-scale activities (professional development and provision of selected ICT resources).

The study built on existing projects in each of the four participating countries. In Mongolia and Samoa, the study focused on projects which introduced e-Resources (electronic teaching and learning materials) to remote and isolated areas of the country, enabling them to have access to up-to-date resources.

In Bangladesh and Nepal, the study focused on projects using ICT for teacher education. The Nepal study examined the use of video recording as an innovative method for primary school teacher training in rural Nepal.

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Sarah Lucas Pouzevara
Binita Parajuli


RTI International is a trade name of Research Triangle Institute.
The Nepal Teacher Education Project

In 2001, ADB approved a loan for $19.6 million to the Government of Nepal to implement an initiative titled the Teacher Education Project (TEP). Co-financed by the Danish International Development Assistance programme (DANIDA), the TEP aims to assist the Government of Nepal to improve the quality and efficiency of and access to basic education through provision of better-qualified teachers.

Through the TEP, nine primary-teacher training centres (ETC-As) have been provided with multimedia Resource Centres. The TEP is also supporting delivery of mandatory 10-month training for all untrained teachers currently teaching in the school system. This training is carried out in three phases:

- 2.5 months face-to-face
- 5 months school-based distance learning
- 2.5 months face-to-face

Because the face-to-face components require trainees to travel to a government centre, this can pose barriers for teachers in remote areas who can not easily travel long distances. For this reason, a mobile team approach was developed so that the training programme can take place in remote areas. Trainers are dispatched, with training materials, to remote areas to provide the 2.5 month-training under the supervision of the District Education Office (DEO). Normally, these trainers are equipped with an overhead projector, cassettes, flip charts, markers, handouts, and musical instruments to supplement the texts. The training is generally delivered in a school classroom with only basic infrastructure.

Using Video Recording in Teacher Training in Rural Nepal

The RETA study built on the Teacher Education Project (TEP) and aimed to ascertain whether use of digital video recording and laptops as tools would enhance the training provided to teachers under the TEP and bring about better learning outcomes among the trainee teachers.

The findings from the study served to inform the TEP and the Nepal National Centre for Educational Development (the central teacher education authority, under the Ministry of Education and Sports) about ways to optimize the use of existing, but underutilized, equipment provided to major primary teacher training institutes around the country. Furthermore, it may provide other countries with practical tips for implementing video recording and playback in the classroom, and suggestions for how the use of video can be expanded beyond its traditional use for self-assessment and critique in microteaching.

To complement the usual TEP teaching materials, the study provided a laptop and digital video recorder each to three mobile teams (which travelled to three areas: Rolpa, Taplejung and Dolpa) – and a package similar to the existing equipment available in the ETC-A multimedia labs mentioned above. The ICT tools were used during an in-service training programme that ran from 15 April to 29 June 2007.

Two trainers from each mobile team were brought to a workshop to learn basic equipment handling and techniques for using the equipment in the classroom for pedagogical purposes.

At each location, the mobile training team provided the standard teacher training programme but also utilized video equipment and laptops in ways that suited the needs, interests and capabilities of the trainers. The number of trainees at Rolpa was 57, while Taplejung and Dolpa had 22 and 36 trainees, respectively.
Digital video technology in education

Although VHS video has been around for many years, and has been common in teacher training in some countries since the 1970’s, the advent of digital recording offers many new possibilities for using video in the classroom, and in developing-country contexts, because of the compact and easily distributed nature of this technology. Digital video creates many new opportunities for viewing, editing and sharing, which were not possible with traditional video recorders and televisions.

The compact and portable nature of today’s video cameras make this much more feasible than VHS tapes played back on a television (the way that video has traditionally been used in teacher training in most countries) for remote and resource-poor settings. Short video capture is now available in most digital cameras and many mobile phones. Some phone networks also allow sending short video clips across the network, similar to a traditional phone call.

Furthermore, digital video provides more convenient options for sharing and storing videos. Sharing digital clips can be an effective way to enhance teacher training programmes by allowing trainees to see current practices in other schools, and share cultural and methodological videos. Again, this is particularly beneficial to remote schools which might not otherwise have this opportunity. Therefore, it makes it a particularly suitable tool for remote areas with poor communications infrastructure, such as the mountainous regions of Nepal.

The use of pre-recorded video in higher education can be used as either a resource to supplement lectures or to substitute for lectures, but the most common use is the former. It is generally selected to help deliver curriculum in cases where visualization is important to understanding, such as scientific simulations and natural phenomena. A common constraint faced by teachers, is selecting appropriate video resources, therefore central management and dissemination of appropriate videos linked to specific curricular goals encourages optimal use of video in higher education. It is also crucial to recognize that video alone does not make an appropriate lesson, but must be combined with preparatory and follow-up activities in a holistic lesson plan.

The use of pre-recorded video, as described above, is translated into ‘learning objects’ in the modern age of computers and digital resources. Learning objects can be defined as: an electronic resource that purposefully combines digital assets, such as a pictures, video or audio snippets, bits of text, or smaller web-delivered applications to communicate a specific concept or message, and therewith has an explicit learning objective inscribed to it. Pre-recorded video can be reused over and over again, according to the needs identified by the teacher. Teachers who can access a repository of learning objects can integrate them into their lesson plans as needed, providing an additional source of teaching aids to enrich the training program. As well as being used to create learning objects, video recorders can be used in teacher training centres to improve teaching practice through self assessment and reflection.

Through interviews with trainers and pre- and post-training questionnaires filled out by trainees in both the study classrooms and a previous training classroom that did not use ICT (a control group), the study team was able to analyse how the technology could be used as a teaching and learning tool in the context of teacher training, whether the use of this technology had any effect on learning outcomes.

The questionnaires delivered to the mobile teams (which used ICT tools) asked how the tools were used, and what effect it had on the teaching and learning processes. The uses of the technology are summarized in Table 1, below.

Table 1: Summary of technology use in teacher training

<table>
<thead>
<tr>
<th>Tool</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video recorders</strong></td>
<td>• Record training activities and classroom lectures</td>
</tr>
<tr>
<td>were used mainly to:</td>
<td>• Record extra-curricular activities, cultural, and community events</td>
</tr>
<tr>
<td></td>
<td>• Record microteaching practice</td>
</tr>
<tr>
<td><strong>Laptop computers</strong></td>
<td>• To edit and play the videos</td>
</tr>
<tr>
<td>were used mainly:</td>
<td>• For administrative purposes (creating teacher lists and writing letters)</td>
</tr>
</tbody>
</table>

Uses of the video recorders

The trainers reported that they had used the digital video recorders to record and playback (using the laptop) three main types of activities.

1. To record actual classroom lectures and activities

This activity served the following purposes:

- Trainers could improve their training practice by reviewing the video and self-assessing performance; they would also be able to review the video before the next time they teach the lesson (maybe after several months) to remind themselves what worked and what did not.
- Trainers would be able to review trainee participation over the course of the 2.5 month period, which helped them to give final marks.
- Trainees could retain the subject-matter content better, and could review lessons where they had specific questions by replaying the video later. Similarly, trainees who were absent could review the actual lesson on the video.
- Trainees were more attentive and participated more, knowing that the lesson was being filmed.
- DEOs and other training supervisors could verify the quality of training and provide feedback to trainers, or adjust the curriculum as necessary.
- Trainees could take a CD copy of these activities, which could help to remind them of some certain processes, especially games and developing teaching aids.

One team also recorded group work and feedback sessions, which allowed the trainees in other groups to see what their fellow peers were discussing.
2. To record extracurricular activities, including school opening and closing ceremonies and local cultural events.

This activity served the following purposes:
- Trainers could use these videos later to provide local content to support social studies lessons.
- Video recordings could be shared among different training institutions, to show differences between urban and rural settings, or different cultures and regions.

3. To record microteaching\(^\text{38}\) (practice teaching in the training centre with peers) and student teaching (school-based, with children).

This activity served the following purposes:
- Trainees were able to see their performance, self-assess their weaknesses, and make corrections.
- Trainees could also compare their performance during microteaching with performance in the actual classroom.
- School supervisors’ comments on practice teaching to trainees in school, with help of video recording, was more effectively and positively received by trainees than without the recording.

Uses of the laptop

The trainers used the laptop for two main purposes.

1. To edit and play the videos

Laptops were mainly used for processing the video from the cameras to edit it to a reasonable amount of time, organize important clips, and playback video to the classroom. (No other projection equipment was provided). The laptops had CD drives, allowing them to playback pre-recorded model teaching videos provided by NCED. This was the first time any of the trainers had ever seen these videos, much less use any kind of video as a teaching aid.

2. For administrative purposes

Where they had the skills to do so, the trainers used the laptops for administrative purposes.

Activities included:
- Creating a spreadsheet with student information;
- Using the word processor to write letters and reprint a training manual for civic education. The analysis of the laptop hard drives shows that apart from the video clips (both unedited and edited), the application used the most by all teams was the word processor, with about 6 new documents created and saved per team.

There were very few edited video clips or movie files created. Most of the video was the full, original clips indicating that the task of editing the clips down to the most useful parts was either too time consuming or the trainers felt that all of the video was worthwhile to keep. Interviews with the trainers indicate that both explanations are likely, and more training will be necessary in order to help users limit the amount of video stored on the computers to a useable amount.

None of the teams used the video cameras for taking still photos. In two cases this is because they did not know how, and in one case it was because they still have traditional cameras for this purpose.

\(^{38}\) ‘Microteaching’ the term used when trainees practice teaching a lesson in front of the classroom, with other trainees acting as pupils. It is distinguished from ‘student teaching’, or school-based practicum, which is when the trainee practices methods in front of an actual primary school classroom, under the supervision of a trainer or school supervisor.
Innovative uses of the equipment

When the study was originally designed, it was anticipated that the video recorder and laptop would be used somewhat differently than the ways they were actually used by trainers. Prior to the activity, a set of suggested categories were given to trainers, with the option of adding additional uses, as needed.

For the video recorder the purposes were:
- Classroom demonstration (Showing a model classroom demonstration)
- Self assessment (Assessing a trainee practicing teaching skills from the training curriculum)
- Personal learning
- Personal use, and
- External relations (Creating or showing video about the training programme or training outputs to the community or other concerned individuals)

It was intended for the video recorders to be used for self-assessment of the trainees’ own teaching practice and to develop a repository of model teaching videos to share with other teacher training institutes. However, the equipment orientation period did not leave a sufficient amount of time for training the users on these purposes. (Most of the 2-day training period was spent just learning how to operate the equipment). Moreover, developing a repository of best-practice or model teaching videos, or even subject-specific videos such as local cultural events or preparation of teaching aids using locally available resources that could be shared among training institutions requires the support and buy-in of the Education Training Centres (ETCs) to make this an effort worth the trainers’ time. The short study period did not leave enough time for that level of advocacy.

It was not expected that the trainers would use the video cameras for recording actual lectures or recording trainees’ participation in classroom activities (except for microteaching). However, this turned out to be the most frequent use of the video recorders, and trainers and trainees alike mentioned the benefit of having a record of the actual training session.

An important unintentional outcome of the study was that the trainers actually used the video for self-assessment and reflection of their teaching practice in the manner expected for the trainees. It also became a supervision tool, to help record training participation marks. Similarly, DEOs and other training supervisors at the ETC level had an opportunity to see how the mobile training sessions were actually carried out and some of the issues they face (for example, the condition of the classrooms).

For example, in Dolpa, the trainers recorded every day’s first session, consisting of a review of earlier day training (in which comments were made by a group of trainees on what other trainees think about the training). The recording helped the supervisors and DEO to know the real situation of the everyday training. Since the third phase training is particularly designed for group work, trainees perform many projects in groups. They felt that recording of group work presentations would give trainees a chance to hear what other groups had been discussing.

The Rolpa team managed to integrate the technology into the training programme with the help of one administrative staff, an experienced technology user, of the DEO who was usually responsible for recording, storing, processing and replaying the video clips throughout the 2.5 month period. This meant that the trainers were not distracted from their training tasks, and there was one staff member
who was able to develop expertise in processing and replaying the video. The Rolpa team chose to allow trainees to view the video clips in small groups or as individuals after school hours, rather than as a full group. There were, however, clear protocols for reviewing video (after 2:00 PM in his office).

For the laptop the suggested purposes were:

- **Personal learning** (practicing computer skills, or learn how to do something new)
- **Personal use** (Using for a purpose unrelated to the training programme (i.e., watching a movie, listening to music, writing a personal letter)
- **Administrative use** (Conducting administrative tasks related to the training programme, including lesson planning, data collection, etc.)
- **Curriculum learning** (Teaching something related to the curriculum of the Phase III training), and
- **Basic skills learning** (Improving basic subject knowledge such as math, English, or science)

In practice, however, the laptop was never used for basic subject knowledge training, no doubt because the trainers had neither supplementary resources – i.e., educational CD-ROMs – nor training to do so.

Except in the case of Taplejung, the trainers did not make a specific effort to improve their own computing skills outside of the tasks related to the study, although they certainly did improve their skills indirectly as a result of the study, mainly concerning video capture and editing.

Although the study suggested using the equipment for community outreach purposes it was not anticipated that the video would be used to create videos relative to the local culture, which could be reused in an instructional setting later.

There were no reports of the computers or videos being used to share information with the community and parents, although they were shared with DEOs as an accountability tool.

Many trainees requested copies of all types of videos on CD so that they could review them again after the training period. It was not anticipated that CD-ROMs would be given to trainees, since there would be no computers available for watching them later. The mobile teams explained, however, that although most schools and homes do not have computers, it is usually possible to find a computer somewhere in the village or neighbouring village, including district education offices, so it is possible that they will be able to view videos later.

**Added value of technology**

As part of the study, interviewers gave questionnaires to both the mobile training teams and a control cohort of teachers who completed the same training programme in the same location and with the same mobile teams, but without using the video and computer tools.

Given the limitations of the study instruments and sample size, the qualitative data from trainer interviews and open-ended questions provides most of the data for the analysis, conclusions and recommendations. However, quantitative data gathered from the questionnaires, and compared between the control group and the study group, does provide some important considerations, which could be followed up with more research in the future.
For example:
- the perceived usefulness of the technology decreased where it was used the least frequently (Taplejung).
- the perceived usefulness of the technology was highest in the site where the trainers were most comfortable with the equipment (Dolpa).
- in Rolpa, the perceived usefulness of watching video was rated as very useful by a slightly larger percentage of trainees, and this may be related to the fact that teachers were able to watch the video individually, after school hours, rather than as a group (on a small screen).
- when the three sites are combined, and compared between the control and study group, there was only a very small increase in overall training satisfaction for the study group, when technology was used.
- where the technology was used the least frequently (Taplejung), the perceived knowledge gain (“How much new knowledge did you gain during this training?”) was much less.

When trainees from the implementation group were asked only about whether they believe that the use of these technologies improved the learning experience, they overwhelmingly answered “Yes”, citing further that the technology made the experience “exciting and fun”, and that they appreciated being able to see their own performance as well as review the lectures over again. Trainers also spoke much more about the advantages of the technology for the training programme, than about the inconveniences or constraints (see next section). They were very enthusiastic about repeating the experience in the future, and had many ideas about how it could be further applied to the teaching process. None of the participants indicated that the technology alone, or learning about technology, was the attraction which would have been expected given the newness of this technology in rural Nepal.

To summarize, the study found that the use of video recording:
- Improves the reputation of the training, as it is a symbol of a more modern approach.
- Improved practice on the part of the trainers as a result of being recorded, and viewing their performance on the video.
- Improves participation (of trainees and trainers), since they know that their performance may be reviewed again by a superior.
- Improves the learning experience by making it more interesting and fun.

There are many ways in which technology proved to be exciting and fun for the participants, but the purpose of the study was to understand its impact on learning.

This is very difficult to measure quantitatively, but some of the ways that video technology can improve teaching effectiveness, as perceived by participants in this study, are as follows:
- Trainees prefer learning through visual methods.
- Improved content retention by being able to re-watch lessons more than once.
- Improved content understanding by being more attentive to the lesson when it is being filmed.
- Improved teaching practice by being able to review and self-identify weaknesses.
- Increased self-confidence as a result of being able to watch oneself performing in front of the class.

A summary of the specific advantages and disadvantages of using this technology in the classroom (as perceived by trainees) is provided in Table 2.
Table 2: Positive and negative aspects of video technology in the classroom

<table>
<thead>
<tr>
<th>Positive Aspects of Technology</th>
<th>Negative Aspects of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makes training interesting, exciting, unique, fun, creates learning environment</td>
<td>Classroom congested, dark, visual not clear</td>
</tr>
<tr>
<td>We could know about our performance, get feedback, identify our weaknesses</td>
<td>Lack of electricity, limited battery power</td>
</tr>
<tr>
<td>Permanency; having a record for a long time of our performance and activities</td>
<td>Lack of adequate resources (other resources)</td>
</tr>
<tr>
<td>Learning is more effective, practical, real, and meaningful</td>
<td>Technical difficulties</td>
</tr>
<tr>
<td>Visual/sound is more effective way of learning</td>
<td>Not used enough</td>
</tr>
<tr>
<td>It is helpful for trainers to conduct training (organization, workload, and more active)</td>
<td>Not enough video cameras</td>
</tr>
<tr>
<td>Various topics (including subject topics) related to training were shown</td>
<td>Time constraint so could not see all of our recorded activities</td>
</tr>
<tr>
<td>Can view colleagues activities, share best practices, get to know other places</td>
<td>Use less creativity, less thought with video involved</td>
</tr>
<tr>
<td>Trainees were encouraged for participation, discipline, support and cooperate to learn</td>
<td>Trainers were nervous, needed more training</td>
</tr>
<tr>
<td>Could learn about technology</td>
<td>Trainee did not get to use the video recorder</td>
</tr>
<tr>
<td>Arouses competition among participants</td>
<td>Expensive</td>
</tr>
<tr>
<td>Can analyze overall training</td>
<td>Screen not big enough to see as a group</td>
</tr>
<tr>
<td>As a tool for entertainment</td>
<td>Too much attention on technology part</td>
</tr>
<tr>
<td>Can show to students and parents</td>
<td>Not proper planning</td>
</tr>
<tr>
<td></td>
<td>Not used appropriately</td>
</tr>
<tr>
<td></td>
<td>Everyone could see other people’s weaknesses</td>
</tr>
</tbody>
</table>

Issues and constraints

Seven issues were identified as posing constraints to the use of the technology for improving training effectiveness, as outlined below.

1. **Language was a barrier to learning to use the computers.**
Due to the fact that the computer operating system that was used was in English, it was understandably difficult for trainers to learn to use the computer through trial and error. Although Nepali fonts were installed, allowing word processing in Nepalese, there were no other Nepali programs available for the computers used in the study.

2. **Reluctance to use equipment in case it was damaged.**
The trainers were very nervous about being held responsible for any damage to the equipment. Therefore they were unlikely to discover on their own, through experimentation, advanced uses of the equipment that they were not specifically trained in.

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39 Listed in order of frequency, the comments are combined from both the open-answered opportunity to say why they answered either ‘Yes’ or ‘No’ to the question: ‘Do you think that the use of technology improved the learning experiences?’ , as well as the open-ended opportunity to list pros and cons of technology use at the end of the questionnaire.

40 Only one person mentioned this as a concern, but it is an important risk to consider when assessing whether the context is appropriate for and how to manage the use of video in teacher training.
3. **Insufficient training in the use of the equipment.**

Given that this was the first time the trainees had ever operated a laptop or a video camera, most of the two-day orientation workshop was spent just learning how to operate the equipment.

To be more effective, the workshop should have lasted three to four days. Additional training was needed on the following:

- Organizing video clips in folders or a database (list) to make it easier to find them later.
- Advanced features for operating the computer and camera. For example, the teams never used the cameras for taking still photos.
- How to use the equipment for pedagogical purposes. For example, specific steps for using video for self-assessment of microteaching practice.

Furthermore, it might have been easier for the trainers to learn to use the laptop if it had been configured differently, i.e. without unnecessary icons on the desktop, and without reminders (in English) to register and update virus software every time they used the computers.

Only one site (Rolpa) had a staff member (an administrator – not a trainer) who was able to manage the technical aspects of the tools (recording and processing video clips). In the other sites, this was the responsibility of the trainers.

4. **Lack of technical support.**

Not only did lack of technical orientation to the equipment make the trainers nervous, it also led to them facing technical difficulties that they were sometimes unable to resolve (for example, one training team was unable to save video clips to the computer due to an accidental camera setting). Due to the extremely remote location of these training locations, there was no local technical support available, and no way for the study team to provide technical support remotely.

A lack of technical support was also cited as a constraint to use of the existing video equipment in the ETCs (provided through the TEP project). In most ETCs, the video equipment is used rarely, if at all. In one ETC, they stopped making videos for lack of human resources and anyone properly trained in using the equipment. To be able to utilize the tools more effectively, trainers will need full time technicians who can tape the instructor delivering lessons or microteaching practice, help transform and edit the video clips for playback, and solve technical problems as they arise.

5. **Lack of associated tools.**

Several associated ICT tools and equipment would have been very useful for the trainers. These include the following:

- A tripod for filming. This would have been a minor additional expense, but would have made it much easier for trainers to film themselves teaching, or film trainees, without being preoccupied by the act of filming. It would also mean that there would not necessarily be a need for a separate camera operator every time, and it would also improve the quality of the videos.

- A projector for viewing videos on the computer as a group. When viewing the videos as a learning activity, the projector is an important piece of equipment for effectively using the video playback feature. However, it is not very feasible in a context where there is no reliable electricity source, and where transportation constraints would make it very difficult to transport such a fragile piece
of equipment. Cords were provided with the cameras to allow projection through a television, but none of the teams had a television available.

- External speakers. A set of external speakers would have made the sound louder – enabling groups watching the video to hear more clearly. Including a set of external speakers (if they run on battery power as well as AC/DC supply) would be feasible to add to the package.

### 6. Lack of electricity in the training centres.
The lack of a reliable electricity source made it difficult to use the equipment effectively. In these rural areas, electricity is only available at a central location, and not all schools or training centres are connected to the grid. Therefore, the trainers had to plan carefully about where to charge the equipment (at the DEO’s office and at their own residences). Solar-powered equipment might have been a viable way of overcoming some of these difficulties.

Due to the lack of electricity, many trainees found the training centre classrooms were too dark. Therefore video recordings were dark and of poor quality for reviewing effectively (especially when no additional projection equipment were available).

Part of the training programme involves several weeks practicum in a nearby school classroom. Although the trainers tried to visit trainees in their schools to record their practice, it was impossible to do this for every trainee because there was often no place to recharge the camera between school visits.

### 7. Lack of staff at the training centres.
In some training centres there was not sufficient staffing to effectively utilize ICT in the teacher education programme. The extremely rural location of Rolpa, for example, means that they have trouble attracting qualified trainers that are willing to stay for two and a half months. There were not enough school supervisors available to visit each trainee teacher to review teaching practice during the school-based practicum.

### Conclusions and recommendations

With regard to the TEP project and its objective of improving the quality of basic education through provision of better-qualified teachers, this experience does provide some compelling anecdotal evidence that the use of video in teacher training can improve the quality of the training and, as such, the learning outcomes.

A lesson learned from the study that can be applicable on a wider scale is that teachers – both school teachers in training or teacher trainers – value the opportunity to see themselves practicing in front of the classroom, and being able to correct their weaknesses and gain confidence.

The results of the study suggest ways in which the use of video can be expanded beyond its traditional use for self-assessment and critique in microteaching. Some additional ways that video and computer technologies can be used include:

- Using video to improve the quality of teacher trainers through self-assessment and reflection on their own practice
- Improvement of the training classroom through feedback from the central level based on reviewing video recordings
• Addressing a lack of material resources for teaching aids through development and dissemination of visual examples of locally produced teaching aids, or video lessons (i.e., model teaching videos, cultural and natural events, etc.)

• Using video for whole school supervision and ongoing teacher performance evaluation for certified and serving teachers. Remote teacher performance evaluation could also be carried out using video recordings that are sent to a subject or methodology expert for review, where one is not available locally (as in many rural areas).

• Improving relations between the community and school by showcasing examples of good teaching practice and student engagement.

In terms of the future application of the video recorder and laptop in the Nepal Teacher Education Project, a number of recommendations were made. In addition to recommending that the constraints (identified above) be overcome, the following recommendations were made:

• To be most effective, there should be one staff member in charge of planning the recording schedule, editing, and replaying video clips, as well as keeping track of the clips.

• Establishment of a community of practice among trainers and training centres would be worthwhile. Each training centre will have to make decisions about the most effective way to integrate video recording and replay into the curriculum, but sharing lessons learned and strategies for optimizing the use of video in teacher training will be important.

• Further benefits of the equipment can be explored when different training institutions – including ETCs, mobile teams, National Centre for Educational Development (NCED), and private teacher training centres – begin sharing digital resources, such as model classroom videos, local cultural documentaries or case studies, and clips of innovative teaching materials among each other. Distribution could be carried out either through recorded CD-ROMs (CDs) sent by postal mail or eventually through email or Internet.

• Television could complement the radio distance learning programme by diffusing model teaching videos, videos of teaching materials preparation, local cultural events and characteristics, and subject-specific educational programmes. The use of videos – created either in the ETCs or through NCED – can also be used to enhance the radio distance learning programme by diffusion through the television or during weekly contact sessions, through tutored video instructional mode.41

There was no way to know, during this study period, whether the teachers participating in the study would be able to utilize video technology and associated new teaching methods in their classrooms. A follow up to this study might seek to re-contact these teachers, as well as the control groups, and see whether or not they have used the new tools and teaching methods.

As soon as data is available, a first comparison can be done to determine whether or not exam scores were equivalent or different between control and study groups. Since the same three teams will most likely be able to use the equipment for one more training year, there is an opportunity to review with them, after this period, whether new uses of the equipment in teaching, or further implications of the same, have been discovered.