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External Evaluation of the University of Sussex In-School Teacher Education Programme (INSTEP)

Final Report to the Gatsby Charitable Foundation (Gatsby Technical Education Projects)

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December 2007

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Acknowledgements

Contents

Executive Summary

- The University of Sussex's In-School Teacher Education Programme (INSTEP) project aimed to enhance the experiences of student teachers through the two-way transmission of video and audio data via a broadband link between classrooms in participating schools and sites in the University of Sussex School of Education.

- The INSTEP system has mostly been used in the following two ways:
  - for the remote observation of experienced practitioners by student teachers; and to a lesser extent,
  - for the remote observation of student teachers by mentors and university tutors.

- INSTEP has been affected by some technical difficulties which have limited its beneficial effects on student teacher development. Our view, however, is that the system we have observed is now sufficiently robust that technical issues should not in future restrict the applications of INSTEP that we have experienced in the course of this evaluation.

- Student teachers have benefited from their contact with INSTEP in the following ways:
  - INSTEP has enhanced student teachers' preparation for their first teaching practice placement through improving their familiarity with the classroom environment and informing their classroom observation.
  - INSTEP has helped the development of student teachers' understanding of the theoretical aspects of the Sussex PGCE course.
  - INSTEP allows for unobtrusive observation of student teachers by mentors, university tutors and their peers which may in turn indirectly benefit student teachers through more effective feedback on classroom performance.

- In the course of evaluating the project, we have identified the following areas for future development:
  - We have not come across any evidence that student teachers have been able to take advantage of the potential of INSTEP to record themselves teaching and thereby to enhance reflection on their own practice.
  - We have been unable to identify any clear benefits for schools deriving from their involvement in the project at this stage. There are challenges here for the University in terms of developing more effective partnership working with schools and for schools themselves in making use of INSTEP as a resource.
  - The use of INSTEP to support Continuing Professional Development (CPD) in schools has yet to have an impact.

- In general, INSTEP is an exciting development which has enhanced the initial preparation of beginning teachers and has the potential to make an even greater impact on Initial Teacher Education (ITE) and CPD.

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1. An Overview of the InSTEP Project

The University of Sussex's In-School Teacher Education Programme (InSTEP) is directed by Peter Adamczyk (School of Education, University of Sussex) and sponsored by the Gatsby Charitable Foundation (Gatsby Technical Education Projects). InSTEP has been developed by the project team as an enhancement of the Post Graduate Certificate in Education at the University of Sussex which is a one year, full-time programme. Student teachers[1] at Sussex working towards a PGCE in science education follow a programme consisting of a mixture of University–based seminars, lectures and workshops and two periods of school-based teaching practice.

The InSTEP project aimed to enhance the experiences of student teachers through the use of equipment designed to enable the two-way transmission of video and audio data via a broadband link between participating schools (also known as Interactive Teacher Education Facilities) and sites in the University of Sussex School of Education (also known as the Interactive Teacher Education Centre). In schools, a number of webcameras are mounted in each classroom allowing coverage of the whole room. Hardware and image processing software allow the cameras to be remotely operated and for video and audio data to be processed, transmitted and stored. Images and sound can be reproduced in classrooms and in rooms at the University through interactive whiteboards and speakers. The interactive whiteboards can also be used to access the software and thereby control the cameras and audio equipment, as well as manipulating images and sound.

InSTEP is an innovation closely linked to the development of the supporting technologies required to enable the video and audio link to function. To a large extent, the story of the development of InSTEP has been a (successful) story of technical development. This report does not, in general, concern itself with technical issues which will, no doubt, be reported elsewhere: judgement on the purely technological merits of InSTEP will need to be made by others. We do, however, comment in places on the ways in which technical issues appear to have affected the experience of student teachers, not least because part of the purpose of this report is to consider the extent to which this innovation might be applied elsewhere.

2. The Evaluation Design

InSTEP has been a complex project to evaluate. A number of stakeholder groups based in different locations have been involved with the project and whilst the University personnel have remained constant throughout the three years, there has been considerable turnover amongst the mentors who have been involved with the project. This raises difficulties in continuity for evaluators as does the rapid pace of change in the InSTEP infrastructure which has meant that InSTEP is now in many ways a different system to that which was in place at the start of the evaluation in 2005. There have also been complex issues of the developing partnership between schools and University to explore as well as the web of personal interactions between student teachers, university tutors, mentors and school pupils to be considered.

The InSTEP project has been the subject of both external evaluation (by the present authors) and an internal evaluation by Michael Eraut and Brian Marsh

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[1] In this report we use the term 'student teacher' to refer to those working towards a PGCE. In interviews, others use the term 'trainee' to mean the same.

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from the University of Sussex. The two teams have worked collaboratively on design issues in general and instrument development in particular, and have shared data in order to: (a) to maximize opportunities for data generation and analysis; and (b) minimize duplication and demands on INSTEP participants.

The aims of the external evaluation have been to make judgments about:

- the benefits of the INSTEP project for student teachers;
- the benefits of the INSTEP project for schools and, if possible, the benefits to pupils in terms of teaching and learning;
- the benefits of the INSTEP project in promoting partnership between schools and the University.

In pursuit of these aims, a variety of data generation activities have been undertaken and these are summarised in the Appendix. Although this report focuses on the activity of the external evaluation, data from the internal team were also analysed along with data generated by the external team. The main findings of these analyses are presented in this report.

Data generated by the external evaluation team consisted of a series of semi-structured individual interviews: three with university tutors and six with mentors. In addition, six group interviews were conducted with up to four student teachers in each group, and we also observed two INSTEP sessions at the University. Interviews and group interviews lasted between 20 minutes and one hour and were mostly conducted at the University of Sussex or in partner schools.

An INSTEP 'showcase' session focusing on team teaching and curriculum enrichment was observed in March 2006 and an INSTEP session involving three schools was observed in June 2007. On this occasion, the INSTEP software was used to view inputs from remote sites and we were able to manipulate multiple video and audio feeds from different sites and talk to student teachers in two schools through the INSTEP link. Additional data for the evaluation were provided in the form of an INSTEP demonstration disc produced by the project team and featuring extracts from INSTEP sessions.

Data generated by the internal evaluation team has included: (i) a questionnaire survey of twenty nine student teachers who had just completed a PGCE course which included INSTEP components; and (ii) a series of six semi-structured interviews with mentors who had supported Sussex PGCE student teachers, half in INSTEP equipped schools and half in non- INSTEP equipped schools.

The internal evaluation team made a particularly significant contribution to the evaluation by bringing a participant's understanding of the research setting since one of the team was himself, at the start of the project, a mentor in an INSTEP-equipped school.

Following transcription of the interviews, a thematic analysis of the interview data was conducted, using Nvivo software, to identify and categorise emergent themes. The questionnaire survey data were subjected to simple quantitative and qualitative analysis. A series of analysis meetings both within and between evaluation teams were held throughout the period of the evaluation to identify emergent themes from the data generated.

In addition to the above data generation and analysis, the external evaluation has been informed by regular attendance at INSTEP Steering Group meetings. We have, at these meetings, spoken to a standing agenda item on the progress of the evaluation and presented summary accounts of interim findings.

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In order to preserve anonymity in quotations presented in the following sections of this report, participants are identified only as 'student teacher, 'mentor' or 'University tutor' and this information is supplemented by the year of their participation.

3. Findings of the Evaluation

3.1 The Uses of INSTEP

The major uses of INSTEP that have been experienced by participants in this evaluation are set out in section 3.1 below. The discussion of the uses of INSTEP also touches on the benefits to be derived from its use, which are explicitly addressed in section 3.2. In section 3.3, we point to what we consider to be the main limitations and missed opportunities of the INSTEP project to date.

i.   Remote observation of classroom activities by student teachers

This was the most common mode of INSTEP use. Of 29 student teachers surveyed in 2006, 28 said that during sessions at the University, they had observed lessons contemporaneously in this way and nine reported observing experienced teachers remotely whilst on placement in an INSTEP equipped school. In sessions at the University, tutors had access to a live feed of INSTEP video and audio material relayed from school classrooms. The material available through these links and the way in which the data could be processed became more sophisticated and reliable as the project progressed. University tutors were able to make use of software to focus on particular features of classroom activity in more detail and, by the summer of 2007, were able to record sections of video and audio material for subsequent viewing.

Whilst the capability of the system was evolving throughout the evaluation, we observed and had the opportunity to use the software to:
- move and zoom cameras in order to focus on particular features, such as one pupil's book or on a wide angle whole classroom view;
- to track individuals as they moved about the room; and
- to view multiple camera views on the same screen, from the same or different schools.

The facility for transmitting audio between sites and the choice and situating of microphones seemed throughout the course of the evaluation to prove problematic. However, the purely technical problems associated with the audio link seemed largely to be overcome by the summer of 2007.

INSTEP offered university tutors the facility of illustrating their teaching with contemporaneous examples of 'real' incidents. In our evaluation, we observed university tutors at the University of Sussex giving a running commentary on the classroom activity being relayed from partner schools and watched experienced teachers in schools giving interactive debriefings for student teachers at the University. Our observations of INSTEP in use, together with the comments by student teachers, mentors and university tutors interviewed for the evaluation indicate that INSTEP added to student teachers' experience by providing a means of extending access to 'real life' classroom situations. Through the interactive video and audio link, INSTEP sessions offered opportunities for student teachers to observe a wider range of experienced teachers in a wider range of schools than would otherwise have been possible in the course of their initial teacher education.

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It also allows trainees to look at a range of schools. University tutor 2007

When you're in your placement schools, you only see the teachers in those schools. When you're here, I got to see teachers that I would never have been able to otherwise and so you get to see different styles. Student teacher - group interview 2007

Both our own observation of INSTEP and student teacher accounts showed that, in INSTEP sessions, student teachers could observe classroom events that were ephemeral, and difficult to discuss in the absence of the sort of 'instant access' to 'real life' examples offered by INSTEP. One feature of these sessions that seemed from our interviews to be particularly significant to student teachers was the opportunity to observe through INSTEP how experienced teachers attend to highly contextual classroom management issues. The following excerpts from some of our interviews and field notes are illustrative:

You can learn about differentiation until it comes out of your ears but it's nice to see a situation where you've also got to control the class and also give somebody permission to go to the toilet and do all these things and tie in with that focus and that was really good. Student teacher – group interview 2007

We saw a lesson at X with a female teacher and a kid did come in late and she just said, 'You're late; see me at the end of the lesson.' And that's all you have to do, and she didn't interrupt the flow of the lesson. Student teacher – group interview 2007

We got to observe how a teacher does all the 'house keeping' whilst the students carry out a starter task. Student teacher 2006 (Questionnaire response)

During INSTEP sessions at the University, tutors provided student teachers with a commentary on the classroom activity being shown. Interviews with student teachers and the evidence of field observations suggest that in this way, university tutors were able to direct attention to particular details of the classroom activity that might otherwise have been overlooked by student teachers. The commentary offered by university tutors could also serve to maintain a focus of attention during an INSTEP session.

I remember one of the first sessions of the year; the teacher was trying various methods of classroom management and you had [university tutor] saying, 'Did you hear what they said there?' It was just an off-hand comment that you could have missed because in the lesson, they were already on to the next thing. Student teacher - group interview 2007

[University tutor] comments on different aspects of what is going on in the lesson. E.g. 'did you notice that the teacher goes to meet the pupils at the door?' and other classroom management issues. He also asks trainees questions about emergent issues in the lesson that they are observing, relating to team-teaching and general pedagogical

> *knowledge (e.g. 'Look how the second teacher is helping keep some pupils on task').* Notes on field observation 2006

> *From my point of view the running commentary keeps you focused, so if you're looking at Assessment For Learning, the commentary keeps you focused on that.* Student teacher - group interview 2007

The observation of school-based sessions by groups of student teachers at the University described above was also supplemented on at least one occasion that we observed and in the data presented on the INSTEP disc produced by the project team, by an opportunity, following the session, for the teacher who had been remotely observed to give feedback and be questioned through INSTEP by student teachers. This sort of activity allowed student teachers to interact and question experienced teachers on aspects of the session that had been transmitted and facilitated discussion within the student teacher group, structured around the basis of a common experience of a lesson which they had just previously viewed as a group.

ii.   Remote observation of student teachers

A second use of INSTEP was as a tool for observing student teachers. There was evidence that some student teachers had been observed through INSTEP by mentors, university tutors and their fellow student teachers. This seemed to be a less frequent use of INSTEP and only five of the 29 student teachers surveyed in 2006 reported being observed at the University whilst teaching in a partner school. This was an aspect of INSTEP which seemed to be particularly welcomed by most of the school-based mentors interviewed for this evaluation: it was mentioned by three out of four mentors in 2005, by one of two mentors in 2006 and by four out of six mentors in 2007. Mentors interviewed for the evaluation in all three years commented on the use of INSTEP to allow relatively unobtrusive observation of student teachers. From the sample of mentors we interviewed, one mentor in 2006 and one in 2007 indicated that they had used the technology in this way.

> *We've used it in order to observe NQTs and trainees remotely quite successfully; it's a means of stepping out of the picture.* Mentor 2006

This application of INSTEP and its associated benefits for teacher education are discussed in section 3.2 below.

iii.   The recording of student teachers' classroom activity

It appears from our observations of INSTEP and from the evidence of the interviews we conducted with student teachers and mentors that INSTEP was used almost exclusively in the two ways discussed above: to allow student teachers to observe experienced teachers remotely or, less frequently, to permit the remote observation of student teachers. A further use of INSTEP: to record student teachers during sessions in the classroom and to use the recording as a basis for subsequent reflection on practice either by the student teacher alone or via discussion between student teacher and their mentor, another teacher, university tutor or one of their peers, did not seem to have taken place to any extent during the course of our evaluation. We believe that there are potential benefits for student teachers in this use of INSTEP, which we discuss in section 3.3, and there was clearly a wish that this capability be developed since a desire on the part of student teachers to see themselves recorded was expressed in all the group

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interviews conducted in 2006 and 2007. Five of the mentors interviewed for this evaluation also indicated that they felt this would be valuable for student teachers.

iv.   Other uses of INSTEP in Initial Teacher Education

During the course of this evaluation we have been aware of other less frequent applications of INSTEP. We have evidence from our group interviews with student teachers in 2007 of the use of INSTEP by student teachers to communicate with schools and vice versa. One student reported a contact with a head of science from a placement school through INSTEP.

> *Before I went on placement, I had a brief contact with the head of science from the school I was going to – he was there and I was [at the University]. We had this kind of meeting [through* INSTEP]*. It was the first time I'd ever experienced it.* Student teacher – group interview 2007

Four student teachers surveyed in 2006 said they had presented to students in schools over the INSTEP link as did three of the student teacher participants in the 2007 group interviews.

> *I did a PowerPoint presentation, we had e-mailed it to the school and they looked at the slides at the same time. That was good. I was scared at the time but the sixth formers apparently really enjoyed it.* Student teacher – group interview 2007

Two post-16 sessions were held in February 2006 and February 2007 in which student teachers based at the University were linked through INSTEP to a school site. On each occasion, at the school site, a teacher led a group of sixth form school pupils through a science practical which was simultaneously carried out by the student teachers at the University. Through the INSTEP link, the teacher leading the session at the school provided a commentary for the student teachers on the planning and management of the practical session. This activity allowed student teachers an experience of practical work with post-16 students (which might not otherwise have been available to them on their school placements) and developed their subject pedagogical knowledge in this area.

> *I've actually done an A-Level physics lesson which was broadcast to the university for the "physics enhancement course" and the physics trainees mirrored the experiment I was doing, and it was really good; the sixth formers found it quite useful.* Mentor 2007

All three of the university tutors interviewed for the evaluation mentioned the potential benefits of using INSTEP as a vehicle for supporting Continuing Professional Development in schools.

> *CPD is an area where INSTEP can have a big impact. The old model of teachers leaving their school after a long teaching day, leaving their school to listen to somebody tell them about an innovation in teaching – it's not attractive to teachers. We can take schools with particular expertise and we can show science teachers in a large number of schools how that is being delivered in real time.* University tutor 20006

The University of
Nottingham
School of Education

The six mentor interviews conducted in 2007, however, gave no evidence of this use of INSTEP. None of the mentors from INSTEP - equipped schools or from INSTEP-equipped schools had experienced INSTEP as a means of delivering CPD, although mentor meetings at the University had included discussion on INSTEP and its potential applications.

> *I've seen it at some of the mentor meetings where we've had sessions showing us how it can be used. I don't think it's been used for mentor training.* Mentor (non-INSTEP school) 2007

> *[University tutors] talked about how INSTEP is used and the potential for it being used for mentor training.* Mentor (non- INSTEP school) 2007

3.2. Perceived Benefits of INSTEP

i. The benefits of INSTEP for Student Teachers

There are limitations to the capacity of an evaluation of this sort to make generalised judgements on the benefits of INSTEP for student teachers. Firstly, we cannot entirely disentangle the effect of INSTEP from the benefits that student teachers would have derived from following a 'traditional' PGCE programme in the same setting. Secondly, given the time frame of this evaluation, we cannot judge how the experiences of INSTEP in the pre-service period might contribute to subsequent teacher development.

It is possible, however, to come to relatively firm judgements on at least two of the areas in which student teachers have derived benefit from INSTEP:

  (1) their preparation for the first teaching practice; and
  (2) the extent to which student teachers feel they have been able to understand and assimilate the theoretical components of their PGCE course.

It has been observed (e.g. Pendry 1997, Younger *et al.,* 2004) that prior to their first school placement, most student teachers have little knowledge of the classroom environment. Through the remote observation of classrooms, INSTEP offers a means of addressing this lack of familiarity. In the 2006 survey, student teachers were asked if they felt that INSTEP had contributed towards making them a better classroom observer. Out of a total of 29 student teachers interviewed, 12 said that INSTEP had been valuable in this respect, whilst 17 said it had not, although these comparatively negative responses have to be seen in the light of the technical difficulties experienced at this stage of the project. In 2007, university tutors, mentors and student teachers themselves were asked how they felt the use of INSTEP prior to their first experience of teaching had contributed to student teachers' preparation for their first teaching practice. In all of the interviews with university tutors, in five out of six of those with mentors and in three of the four group interviews with student teachers, participants expressed the view that INSTEP had made a positive contribution in this area. Student teachers' preparation for their first teaching practice was said to have been enhanced either because they had a more realistic idea of classroom practice or because their ability to observe was improved.

> *[INSTEP] kind of gives them more of a realisation what it's actually like. All the lectures and sessions you have before you go in to school; you get this very idealistic view of*

what being in the classroom is like. I think InSTEP gives them a much more realistic view of what it's going to be like. I don't want to say lower their expectations, but they go in knowing what to deal with. Mentor 2007

I think InSTEP gives the trainees more confidence in what to expect in schools. I think some start not having a clue. It doesn't give them experience but they do see things before they arrive. Every trainee is different but all will see something to help. Mentor 2007

I think it [InSTEP] helped with our observation as well, when we went into school for the first time because they'd already pointed out the things that we should be looking for. Student teacher – group interview 2007

I think probably, going in for the first time, having seen things in real life situations [via InSTEP] was helpful mainly because it wasn't just applying things you'd been told. Student teacher – group interview 2007

The second apparent benefit deriving from InSTEP use is the contribution made by remote observation with commentary from a university tutor to improving student teachers' understanding of the theoretical components of their PGCE course. All three of the university tutors interviewed for this evaluation spoke about this use of InSTEP in helping student teachers relate theoretical aspects of their training to classroom practice and in two of the 2007 group interviews, student teachers also spoke about the impact of InSTEP in this respect.

[One use of InSTEP is] to make immediate the link between theory and practice so they don't have to wait a week or two before they could take what we've discussed here into the classroom. University tutor 2007

The one thing that stands out was Assessment For Learning. At the start, they [University tutors] were talking about AFL, and nobody knew what was going on and then we watched a teacher teach a lesson that was purely AFL and he was answering the questions that we were asking him as well and we were like, 'Oh that's it!'. Student teacher – group interview 2007

Before you got into schools, the theory didn't make any sense. You can't really tell people how you do things; you've got to show them. But that helped, it kind of bridged the gap. Student teacher – group interview 2007

You can learn the theory but when you see it happening [via InSTEP], it really comes to life for you. Student teacher – group interview 2007

In general, student teachers tended in their interviews to comment not on science specific issues, but rather on general classroom management themes. One of the university tutors interviewed for this evaluation, however, described how InSTEP could also assist in student teachers' development of subject pedagogical knowledge.

I think sometimes when you're looking at conceptual difficulties like particle theory. Trainees' problem is they've long ago forgotten when they had that difficulty and I think [observation through InSTEP] possibly takes them back to when they did have that trouble. They always agree that on first teaching practice, they aim things too high and they've forgotten where kids are and I think InSTEP helps them to understand the level that kids are at with particular concepts. University tutor 2007

INSTEP did appear to contribute towards the development of student teachers through the opportunities it provided for unobtrusive classroom observation. Student teachers in INSTEP-equipped rooms were observed remotely on the school premises or at the University without the need for a mentor or tutor to be present, altering the dynamics of the classroom. The evidence of our evaluation is that this use of INSTEP was not widespread: student teachers in two of the four 2007 group interviews, one of the three mentors in an INSTEP-equipped school interviewed in the same year and one of the four mentors who participated in 2006 reported the use of INSTEP in this way. This aspect of INSTEP seemed, however, to be especially valued by two of the mentors who had used INSTEP in this way.

The problem is that our presence in the classroom will always have an effect on how the students behave and one of the great things about having a system like this is to be able to take yourself out of the classroom but still to be able to view the kind of practice of the trainee teacher. Mentor 2005

The other thing that's INSTEP's really good for is using it to observe your trainee remotely, so you can sit in another room and they can feel how it really is when you're not there. So that's good for trainees, because it has been him alone in the room and he is the teacher, you're not sitting there making sure the classroom management stays under control, he gets to really feel his feet. Mentor 2007

One of the student teachers who said in a group interview in 2007 that his teaching had been observed through INSTEP suggested that there might also be advantages for student teachers in being observed in this way.

It's quite nice because you don't have somebody sitting in there, it helps you forget the fact that you're being observed as well, although you're aware of it, you're not catching the eye of somebody sitting there at the front or at the back. Student teacher – group interview 2007

ii.   The impact of INSTEP on the promotion of partnership between schools and the University

Our evaluation has considered the extent to which INSTEP has had an effect on extending partnership in initial teacher education with the University of Sussex to a wider range of schools and the extent to which INSTEP has had an effect on deepening already existing partnership working between the University and schools.

It is important to note that the local schools working with the University of Sussex on the INSTEP project were all established partner schools with a history of

supporting the Sussex science PGCE. Mentors from these schools interviewed for this evaluation appeared to appreciate and value their relationship with the University.

While in the future, it may be that InSTEP might be used as a vehicle for Sussex and to develop relationships with previously unconnected schools, this appears not to have been the case during the period of our evaluation. Our understanding is that technological issues and an understandable aim on the part of the project team to control the pace of development of this initiative have limited the spread of involvement of schools in InSTEP. The following comments by mentors hint at some of the barriers to wider participation by schools in InSTEP.

> *Most of the discussion at mentor meetings is about InSTEP and what is going to happen. But this leaves out the others. I think we should focus on the overall mentor practice and then think how InSTEP could be used to develop this.* Mentor 2007

> *They [university tutors] are telling us about the opportunities but we never wanted to be an InSTEP school because we just had too much going on at that time to want be thinking about organizing anything else.* Mentor 2007

The evidence of our evaluation on whether InSTEP has, overall, deepened existing partnership working between Sussex and partner schools that have been involved in the project is mixed. All of the university tutors interviewed in 2007 felt that InSTEP had played a part in developing the partnership between the University and schools and this view was echoed by two of the mentor participants in 2006.

> *InSTEP certainly consolidates partnership. Schools like the fact they're being consulted and valued for their expertise and that in itself is very valuable.* University tutor 2007

> *It's a cultural change which creates a mutual respect between teacher educators and teachers. Teachers out in schools get to see us teaching and they get to see us teaching kids sometimes. It means schools are prepared to take on some of the theoretical approaches that have been developed here. Because they can watch you and you can watch them and they can see what you're bringing in, what you're adding.* University tutor 2007

> *We've always been keen to take trainees but we've never felt we were part of the discussion process of the programme. Now with InSTEP, we discuss the programme, we discuss what we think the students need. It's open to dialogue and we're far more involved which is great.* Mentor 2006

However, recent mentor interviews conducted in 2007 suggest that InSTEP might have played a more marginal role in this respect.

> *I haven't really used [InSTEP] here. It has been mainly used for the University.* Mentor (InSTEP-equipped school) 2007

Another, perhaps indirect reflection on the closeness of partnership working between schools and the University is given by two comments from trainees this year suggesting another area in which co-ordination between the University and schools might be improved.

> *It's a bit funny because you have professional studies here and then you have it at your placement so you might have the same lecture three times.* Student teacher – group interview 2007

> *What we had in schools often repeated what we were told here so I think they could co-ordinate it a lot better.* Student teacher – group interview 2007

Our conclusion here, based on the limited information available to us as evaluators is that we have no convincing evidence to date that, in the context of the science PGCE, INSTEP has either widened the range of schools involved with the University or deepened the partnership with those schools who have been involved in using INSTEP. A contributing factor to the lack of impact made by INSTEP in this respect has been a high level of turnover amongst the school-based mentors associated with the project. Mentor turnover is something with which all initial teacher education partnerships have to contend, but the importance of the mentor's role in co-ordinating INSTEP use suggests that this requires particularly close management if technologies like INSTEP are to be used effectively. It would seem that there is a need for robust succession planning in this area.

3.3. Areas for Future Development

Whilst, as reported above, this evaluation has identified benefits for student teachers and for the University from the use of INSTEP in supporting initial teacher education, it appears from our contact with a range of stakeholders that INSTEP has the potential to make a still greater contribution both within ITE and in other contexts. In this section, we comment on four areas in which the potential of INSTEP seems not to have been fully realised to date and where the impact of INSTEP might be enhanced in the future:

    i.   The recording of student teachers' classroom activity;
   ii.   INSTEP sessions at the University;
  iii. Working with schools; and
  iv. INSTEP as a tool for CPD.

i.   The Recording of Student Teachers' Classroom Activity

There was a near unanimous feeling amongst the various groups to whom we spoke that INSTEP might have been used more extensively to record student teachers in the classroom. Replaying this material would, it seems, have provided a valuable resource for student teachers to make use of and our data indicates that this was perhaps an expectation of student teachers before their placement in INSTEP-equipped schools.

> *I come from pharmaceutical sales, and videoing yourself in a sales call and watching it back, they do that a lot and you pick up so much and there might be something you do yourself and don't notice and that's very useful to know.* Student teacher 2007

> *I can imagine how it would be helpful to the trainee, to be able to replay parts of the lessons and show them how they are tackling situations in the class*. Mentor 2007

> *I would have liked to have seen a video of my own teaching.* Student teacher 2006 (questionnaire response)

Two student teachers who took part in the same group interview made the point that they felt there was potential for more peer observation through InSTEP.

> *I think more could be made of it for trainees observing other trainees. For example, in my school, I could have moved rooms so they could observe me and that could have been quite an informal thing, trainees observing trainees, with no other member of staff present.* Student teacher 2007

> *Yes, at [school], my trainee colleague, I could have watched her, we could have taken turns but it didn't occur to us and the school didn't suggest it. It's something that hasn't been talked about a lot.* Student teacher 2007

It appears to us that recording and subsequent observation; whether alone, with peers or with mentors, could make a significant contribution to early teacher development as a means of supporting self-reflection and mentor coaching. It seems that InSTEP is a medium that could facilitate such activities. From the evidence of our evaluation, however, it seems that student teachers' experience of observation through InSTEP was limited to viewing experienced teachers. Although the value of these sessions has been acknowledged above, there does seem to be considerable potential for InSTEP to make a greater impact through self and peer observation.

ii.   The Management of InSTEP Sessions at the University

The majority of the negative comments about the University-based InSTEP sessions, especially in the 2006 questionnaire survey and the 2006 group interviews related to issues of technology and in particular to the sound quality and interruptions in the link between the University and remote sites. There were noticeably fewer comments to this effect in the 2007. The manner in which technical issues have been dealt with by the project team to date suggest, insofar as we as evaluators can make a judgement, that such difficulties can be overcome given sufficient resources and should not in themselves present a barrier to the future development of InSTEP.

The efficacy of InSTEP as an educational tool for student teachers, however, does not solely depend on the functioning of the technology: there are also considerations of how InSTEP sessions are organised at the University. As we suggest above, these sessions were generally well received by student teachers but some comments from student teachers raise questions about the organisation of the ITE classroom at the University. A minority of student teachers in one group interview in 2007 spoke about the difficulty of seeing and following video presented on the interactive whiteboard. In one of our observations, we noted similar problems of visibility.

> *Sometimes you can't see the board and when there's forty of us round the board, it's too many.* Student teacher 2007

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I thought it was a waste of time, you couldn't see it very well and you can't get a whole picture because they're always zooming into one kid writing away and what does that tell you? Nothing. Student teacher 2007

[The] tutor is showing the lesson objectives via PowerPoint, but the font size appears to be too small for some trainees to read. Notes on field observation 2006

Our evidence also suggests that remote university-school discussion sessions following INSTEP classroom observation might raise issues of pedagogy in the teacher education classroom. As one university tutor suggests, trainees might perhaps need guidance in their questioning and, as was commented in one group interview, the dynamics of the student teacher group also need careful management. It may be significant in this context that none of the trainees who participated in this evaluation included post-lesson debriefs amongst the benefits of INSTEP.

I actually think though that it's quite difficult to decide what you want to ask quite quickly like that and you sort of feel on the spot with your whole cohort around you. I've felt interested but I've not felt like putting my hand up and asking a question. Perhaps if we'd had time to think about it and then ask the same teacher later on. Some people asked quite frivolous questions. Student teacher – group interview 2007

These challenges relating to the management of INSTEP sessions seem to us to be relatively minor when compared to the potential benefits that flow from the use of INSTEP to enrich the experiences of student teachers.

iii.   Working with schools

Interviews with school mentors and group interviews with student teachers provide little or no direct evidence of any benefits for schools from their participation in the INSTEP project. It may be that the schools concerned already benefit from their partnership with the University in initial teacher education but there seems to be no apparent incremental benefits either for individuals based in schools or for schools overall stemming from their participation. In interviews throughout all three years of the evaluation, mentors spoke about benefits for individual student teachers rather than identifying benefits for schools and/or pupils as a result of involvement in INSTEP (although benefits for student teachers would imply indirect benefits for the schools in which they are placed). On the other hand, there was evidence in our evaluation of INSTEP equipment being underutilised in schools and of individuals appearing not to engage fully with the project.

[Teachers at the placement school] were aware that they weren't using INSTEP much and realised that they should have been using it more. They basically knew they had to pull their finger out and use it because it's good for their development. Student teacher 2007

We have a problem here in as much as the person who's room the INSTEP cameras are in isn't really into using the technology at all. Mentor 2007

One comment from a mentor interviewed in 2007 reflects a feeling that technical issues may have actually detracted from pupil learning in schools. No other participant refers to this concern but the comment perhaps indicates a possible source of tension between school and INSTEP provider.

> *We have had a number of technical difficulties, which have made some sessions difficult and you sometimes wonder if the students are really benefiting because lesson time is getting eaten up by having to sort out technical problems*.
> Mentor 2007

The relationship between schools and the University is clearly of central importance in the use of INSTEP. This has been recognised from the start by the INSTEP project team who have allocated resources to the development of school partnership in ways that have included, for example, the production of a User Manual. It seems clear that the successful application of INSTEP, which requires synchronism between school and University, relies just as much on effective joint management of lesson planning, content and timing as it does on the technical infrastructure. Two contributions from mentors and one from a University tutor hint at some of the issues that are involved in co-ordinating INSTEP observation sessions.

> *The choreography between the training session and the lesson being delivered in the school is important as well and we've certainly seen the best sessions where teachers have provided us with quite detailed lesson plans.*
> University tutor 2007

> *[The University] ring up in a morning for a session in the afternoon. For planned sessions I would prepare a little bit more deeply and it takes a little longer.* Mentor 2007

> *Sometimes you say we are going to do this thing with the University and the University have started already and it's, 'Right hang on, hang on! Right, you're going to miss a bit of your break time'. Sometimes lesson quality can go down when something has to be fitted in around the University.*
> Mentor 2007

The fact that, to date, we have been unable to identify any clear benefits for schools deriving from their involvement in the project should not be taken to imply that there have been no such benefits or that we expect that such benefits will not be forthcoming in the future. The INSTEP infrastructure installed in classrooms represents a significant asset for schools which can, and we hope will, be used to support learning by pupils and teachers in the years ahead.

iv.   INSTEP as a Tool for Continuing Professional Development

As well as its applications in the field of initial teacher education, INSTEP has the potential to make a contribution to Continuing Professional Development. As has been suggested to us by several of the University tutors to whom we spoke, INSTEP offers advantages in this area by facilitating teacher access to CPD, both temporally and geographically and by making sessions more interactive. Comments from university tutors in two interviews suggest that CPD is an area of future development for INSTEP.

> *When it comes to CPD applications, that's got to be approached very carefully and at the moment I'm looking*

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School of Education

to widen access to CPD and monitor quality of CPD. There are some potential problems, it's all too easy to record a lecture and deliver it and say, 'That's your CPD' but it's the very interactive nature of the system that we need to capitalise on. University tutor 2007

It seems that whilst this development of INSTEP might become a higher priority in the future, the use of the technology in this way has, to date, been limited.

4. Conclusion

INSTEP is an innovation in educational technology which we believe has the potential to transform the experiences of a wide range of learners in a number of ways. The overall conclusion from our evaluation of the University of Sussex INSTEP project is that although student teachers have so far benefited from the use of INSTEP in their initial teacher education, the identifiable benefits for those student teachers and for partner schools to date have been limited in relation to the potential of INSTEP. As much as anything else, this is a reflection of the size of the task that the INSTEP project team set themselves in developing the system whilst at the same time bearing responsibility for the initial teacher education of a sizeable cohort of student teachers each year. We have been struck by the energy and resourcefulness with which the project team has pursued the development of INSTEP throughout the three years of our evaluation. It seems likely to us, given the potential of INSTEP, that their work will continue to bear fruit for their own institutions and for others in the future. The purpose of this report, in part, has been to provide an account of how and why the potential of INSTEP still remains to be harnessed and to set out some of the conditions that might be necessary for that potential to be realised in the future.[2]

INSTEP, like many ICT-dependent projects, has been affected by continuing technical difficulties. The stability of the video and audio data linkages, the quality and reliability of audio transmission in both directions and human interfaces with cameras and microphones have been some of the problematic areas. These technical difficulties have affected and limited the experiences of student teachers and tested the relationship between schools and the INSTEP project team. The INSTEP team has invested considerable time and resources in addressing these problems and has made a good deal of progress in improving the reliability of the INSTEP infrastructure. Whilst, as pointed out above, this is not a technical evaluation, our view is that the system now appears sufficiently robust to support the uses of INSTEP that we have observed.

Whilst our focus in this evaluation has not been on the management of the personnel involved with the project in various capacities, we have been aware, as we suggest above, of the limited human resources at the disposal of the project team. INSTEP, at least in the early stages of its development, which we have observed in this evaluation, seems to be resource intensive: staffing needs to be available, sometimes simultaneously, both at the University end and at the school end of the INSTEP link in order to manage technical issues and to facilitate co-ordination between sites. As we have indicated above (section 3.3 iii), The INSTEP team has now gone some way towards meeting this need through the designation of a Field Officer but as this appointment was made from within the PGCE team, it does not represent additional resources so much as a reallocation. Our

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[2] The focus of the evaluation has changed slightly from that originally conceived by the external team. As our understanding of INSTEP has grown throughout the three years, we have tended towards a more developmental view of the project.

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School of Education

recommendation is that staffing issues should be given particular consideration in the development of InSTEP and similar projects in future.

The majority of student teachers interviewed and surveyed for this evaluation valued the InSTEP inputs in their training.[3] InSTEP has been used in this project to address one of the limitations of 'traditional' Initial Teacher Education courses in the early stages and especially before the first teaching practice, of student teachers' unfamiliarity with the classroom environment (Pendry 1997, Younger *et al.,* 2004). Our evaluation suggests that student teachers can develop their ability to observe and interpret classroom practice through the use of InSTEP to view and to hear classroom activity in real time, supplemented by expert commentary from experienced ITE tutors. Comparable gains in the ability to observe in similar circumstances have been reported by van Es & Sherin (2002).

Whilst much of the discussion at InSTEP Steering Groups, for example, has centred on the technology deployed, our evidence suggests that human or non-technological factors may be just as significant in the success of this sort of session. Amongst these factors, the quality of the commentary from the tutor seems to be an important part of the process but the effectiveness of the co-ordination with the school and the way in which the experience of the student teacher in the University is managed seem from our evidence to be important. The emphasis in sessions of this kind seems from the accounts of mentors and student teachers to have been on occasion tilted too far towards technological delivery rather than pedagogic effectiveness for the student teacher.

Student teacher and university tutor participants in this evaluation provided evidence of the use of InSTEP to enhance student teachers' understanding of theoretical concepts of pedagogy and to relate those concepts to observed classroom practice. It has been argued that this concretising of abstract pedagogic conceptions has an important role to play in teacher education (Smagorinsky *et al.,* 2003). Student teachers gave convincing accounts of the development of their understanding through seeing theoretical conceptions such as Assessment for Learning illustrated in InSTEP sessions. Equally, student teachers spoke about the value of InSTEP in demonstrating often seemingly trivial classroom management techniques which had particular significance for student teachers with little practical knowledge in this area.

Another benefit of InSTEP use that emerged in the course of our evaluation relates to its use as a means of unobtrusive observation. This application was particularly welcomed by the small number of mentors who had made use of the system in this way. In comparison with other applications of InSTEP, this use might make fewer technological demands and offer mentors the possibility of more flexible and less intrusive observation of student teachers than would be the case with traditional in person observation.

Perhaps the clearest consensus in our evidence was the widespread wish amongst student teachers and mentors for student teachers to have the ability to observe recordings of themselves through InSTEP. This aspect of InSTEP appears not to have been a priority for the project team and, as a result, InSTEP activities for student teachers have predominately consisted of observing more experienced teachers. In this sense, InSTEP seems only to have offered student teachers the opportunity to reflect on the experiences of others without the immediacy of personalised coaching related to individual experience. There are reported

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[3] For example: of 29 student teachers surveyed in 2006, 24 indicated that they felt that 'InSTEP time' in the University was sometimes an effective use of their ITE time, 3 said they felt it was never spent well and two said InSTEP time was always productive.

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School of Education

benefits for student teachers to be derived from the observation and critical review of their practice of their own teaching, especially with the assistance of a mentor or other teacher educator (Sherin & Han 2003, Abell & Cennamo 2004). It seems from our discussions with the INSTEP team that technical difficulties in compressing video data together with security and data protection concerns over the availability of recorded material might explain the delayed development of this facility. Our interview data suggest, however, that some student teachers placed in INSTEP schools did expect to be able to use the technology in this way prior to their placement and given the potential benefits of this activity and the apparent willingness of trainees to participate in recordings of this sort, it seems surprising that some alternative provision for recording and playback was not offered by either the University or by the schools concerned.

There is little evidence that INSTEP has so far been a force for widening or deepening partnership between schools and the University. To a large extent, this can be understood in terms of a project in a phase of technological development where the priority has rightly been on building on the robustness of existing links rather than on expansion. Nevertheless, this evaluation has identified some challenging issues of partnership that should be considered by institutions and schools adopting INSTEP-style systems in the future. The co-ordination of universities and schools is a complex problem and the areas that require attention include: the development of a protocol between school and ITE provider about how and when observation technology should be used; the timings of the school and University days; the provision and circulation of lesson plans prior to observed sessions; the enabling of post-session debriefs and question/answer sessions by teachers in schools; the training and subsequent involvement of mentors in the development of and applications of the observation technology and the autonomous use of INSTEP equipment within and between partner schools. Underpinning some of these issues is the question of the commitment of those in schools to making use of technologies like INSTEP. We have not systematically evaluated this aspect of partnership with schools but our evidence suggests that in some schools, involvement with INSTEP was limited to a few individuals within science departments, with little involvement from senior management.

All of these aspects of the relationship will require negotiation between schools and ITE providers and it seems likely that different ITE environments might adopt different models of partnership although there will, no doubt be commonality between INSTEP-like systems developed by different providers. We have, for instance, been struck throughout our evaluation by the parallel development of INSTEP and the Teaching and Learning Observatory.at the University of Nottingham (see Coyle 2005). Both projects appear to have been faced with similar challenges and there may be a case for more co-operation in the development of these technologies in the future.

It does seem from our experience that INSTEP has the potential to play a part in the development of closer and perhaps more decentralised partnerships between schools and Higher Education Institutions since INSTEP offers advantages both ways: we have considered the likely benefits to schools above but it should also be noted that ITE providers can themselves gain from the enhanced access to classroom practice offered by systems like INSTEP. Remote observation also offers economic and ecological benefits in reducing the need for travel by student teachers and university tutors. Finally, although this project has been concerned with science education, both we and the project team recognise the potential to develop INSTEP in other subject areas, and we would encourage progress in this area.

5. References

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Appendix: Summary of Data Generation

Internal Evaluation Team	External Evaluation Team
• PGCE Tutor Feedback • Student teacher questionnaire survey (June 2006) (n=29) • Interview with 6 mentors (June 2007)	• **Interviews with 4 mentors (September 2005)** • **Follow up interviews with 2 mentors (May 2006)** • **2 Group interviews with 7 student teachers (June 2006)** • **Observation of INSTEP showcase (March 2006)** • **Observation of INSTEP session(s) at Sussex (June 2007)** • **4 Group interviews with 16 student teachers (June 2007)**
• Feedback from school pupils • Interview with 6 mentors (June 2007)	
• PGCE Tutor Feedback	• **Interview with Assistant Project Director (May 2006)** • **Interview with Sussex PGCE tutor (June 2007)** • **Interview with Project Director (May 2007)**