Tele-Guidance to Develop Reflective Practice: experiences in four teacher education programmes across Europe

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ABSTRACT The use of tele-guidance environments with student teachers and their teacher educators was implemented during teaching practice and evaluated for four European teacher education programmes in the REFLECT project. Tele-guidance can be contrasted with more common supervision methods such as face-to-face meetings between the student teachers and the participating teacher, or between a group of student teachers and their supervisors at the teacher education institution. In our research and evaluation, we focused on the content and the nature of discourse in different modes of tele-guidance in teacher education, particularly with respect to student teachers’ reflective practice. During their field experiences, tele-guidance was primarily used by student teachers for reflection on technical and practical issues. It was used less than expected for critical reflection and exchanging pedagogical content knowledge, including general and instructional theories, and aspects of the teaching profession. The research led to the conclusion that more attention should be paid to the structure of student teachers’ tele-guidance environment, as more coaching and instruction of student teachers in the systematic and reflective use of tele-guidance could lead to more varied and extensive communication.
Introduction

There is at present increasing use of tele-guidance in the learning environment of teacher education. The implementation and evaluation of the use of tele-guidance in the supervision of student teachers were researched by the European REFLECT project. In this 1-year project (1996), supported by the European Commission, the teacher education programmes of the universities of Barcelona, Exeter, Trondheim and Utrecht were involved in using various forms of tele-guidance. This article presents the results of a preliminary evaluation of the use of tele-guidance with student teachers and supervisors in the four teacher education programmes. The main research question was: ‘What is the content and the nature of discourse in different modes of tele-guidance in teacher education, particularly with respect to student teachers’ reflective practice?’

Framework of the Four Teacher Education Programmes

In general, perspectives on the content, process and purpose of reflection can be divided into two main streams. On the one hand, authors like Zeichner (1983) emphasise the need for enquiry into the contexts in which teaching takes place, and the ethical, moral, and political issues that influence one’s teaching. He particularly applies this concept of reflection to the education of in-service teachers. On the other hand, some authors focus more on pre-service teacher education and describe reflective teaching in terms of structured problem solving, based mostly on problems occurring during classroom teaching (see, for example, Copeland et al., 1993; Korthagen & Wubbels, 1995). Some authors combine these different perspectives on reflection into a variety of ‘levels’ of reflection (see, for example, Sparks-Langer et al., 1990). Another well-known hierarchy of reflection has been outlined by van Manen (1977). At the first level, technical reflection, the teacher considers the best way to reach an goal not previously defined. At the second level, practical reflection, the teacher examines the means and the goals, and recognises that the meanings are not absolute, but are embedded in and negotiated through language. The third level, critical reflection, as well as including emphases from the previous two, also calls for considerations involving moral and ethical criteria.

In the present study, three different modes of tele-guidance to promote student teachers’ reflective practice were implemented and evaluated: computer conferencing, one-to-one email conferencing and video conferencing.

The research drew on previous work. One-to-one techniques conducted by email applications or video conferencing can be used in supervising student teachers individually to increase the communication between
teacher educator and students (for example, as in Moore, 1991). On-line classroom and electronic lecturing are examples of one-to-many techniques, and have been described in other papers (see, for example, Cotlar & Shimabukuro, 1995; Mason, 1995; Oliver & Reeves, 1996; Paulsen, 1995a). Many-to-many techniques make collaboration and cooperative learning possible. Computer conferencing supports the benefits of the one-to-one and the one-to-many techniques. In the USA, tele-guidance, and computer conferencing in particular, have been used in the supervision of student teachers (for example, Burlbaw, 1993; Harrington & Hathaway, 1994; McIntyre & Tlusty, 1995; Schlagal et al, 1996; Thomas et al, 1996), and this has also been used in the United Kingdom (UK), especially by The Open University (Selinger, 1996).

The Four Case Studies

The student teachers’ participation in the tele-guidance projects during their teaching practice was more or less voluntary in all four teacher education programmes studied here. The student teachers received enough information about the projects on which to base their consent to participate. They were instructed in how to use the software and hardware and the participants (student teachers and teacher educators) agreed upon the frequency and the quality of their participation. Each tele-guidance project was provided with technical support by a help desk at the teacher education institution. In one case (Trondheim), student teachers were also instructed in the theory of reflection. In the other cases, notions on reflection were incorporated into the teacher education curriculum. In Exeter, for example, a model of teaching has been developed to inform the whole programme.

The Utrecht Case

Theoretical Perspective on Reflection. In the teacher education programme at the University of Utrecht, reflection is defined as the mental structuring or restructuring of an experience, a problem or existing knowledge or insights (Wubbels & Korthagen, 1990). Korthagen (1985) describes a generic process of reflection in terms of the so-called ALACT model of reflection (see Figure 1). This model of systematic and rational reflection is named after its five phases: Action, Looking back, Awareness of essential aspects, Creating alternative methods of action and Trial. The fifth phase is itself the first (action) phase of a subsequent cycle, which means that we are dealing with a spiral model of ongoing professional development. Method. During a period of 3 to 4 months at the end of the teacher education programme, student teachers taught one subject for 10 classes a week in secondary education. In addition to teaching, student teachers were fully responsible for tests, grades, school reports, parents evenings and
meetings. In addition to the more traditional face-to-face supervision methods, computer conferencing was introduced for use with student teachers and teacher educators. During their practice, student teachers were provided with a modem, communication software and an electronic mailbox for use at home to enable them to send email messages in which they could discuss their experiences. The participants could send messages to the whole discussion group (all students teachers and one or two teacher educators), as well as to one or more individuals.

During the periods of teaching practice, 30 student teachers and four supervisors were involved in computer conferencing, including three discussion groups varying in size from four student teachers and one supervisor, to 21 student teachers and two supervisors. All 525 email messages sent to the discussion groups were collected. Some 80% were analysed with the focus on student teachers’ reflection and their responses. The measurement of student teachers’ reflection was based on the three successive phases of Korthagen’s ALACT model (1985). We followed an iterative procedure involving constructing instruments that were fitted to the data collected.

Figure 1. The ALACT model used in the Utrecht case (from Korthagen, 1985).

Results. Analyses of student teachers’ email messages showed that student teachers almost exclusively wrote about their own experiences on teaching practice. The email messages summarised their daily experiences. Although interrelating themes, causal attributions and creating alternative actions are understood as essential aspects of the ‘Awareness’ phase from the ALACT model, the student teachers seldom showed this kind of reflection in their email messages. They mostly wrote about discipline problems and pupil
misbehaviour. Themes more distant from their own teaching, such as general or instructional theories, were seldom described.

During analysis of the messages, an iterative procedure for clustering student teachers’ responses to messages from peers resulted in four types of responses:

- Responses expressing empathy and emotional support. This kind of response was most frequently observed, probably because most messages referred to perceived problems in teaching. Almost every reaction started with an expression of empathy (‘Lord, how awful!’), recognition (‘I sympathise with you, and I know what you’re writing about’) or motivation (‘keep up the good work’). Some of these responses were at the end of a message, including statements such as ‘carry on’, ‘I wish you good luck’ and ‘I hope I helped you with this’.

- Responses describing their own teaching experiences. These kinds of responses prompted student teachers to put their own stressful experiences into perspective (‘I am not the only one with discipline problems’) or to try out the problem solving strategies of others. Furthermore, student teachers could compare those strategies with their own experiences and get an idea of teaching in other schools.

- Responses consisting of informational support, including tips and suggestions. These responses related to pedagogical content knowledge were less frequent, and primarily consisted of tips about problem solving strategies that the writer had already tested. Responses suggesting the use of theory and literature were not observed.

- Responses focusing on stimulating student teachers’ reflection were seldom observed. Student teachers reported that they saw insufficient clues in their peers’ email messages to which they could react in order to help them with their professional development.

Teacher educators participating in the computer conferences created a safe context in which student teachers could reflect, asked student teachers to reflect, and offered tips and answers related to specific problems. Different teacher educators played the moderator role in different ways. Some supervisors were more actively engaged in the computer conferences in that they reacted frequently to student teachers’ email messages, occasionally initiated the discussion, and tried to involve student teachers in the conferences. Other teacher educators chose a less active role. They claimed that they did not have enough time to be actively engaged, and they considered computer conferencing to be specifically for student teachers only. Student teachers were more positive in their evaluations of the more active moderators than of their less active counterparts.
The Trondheim Case Study

Theoretical Perspective on Reflection. The theoretical model that lies at the foundation of the Trondheim programme refers to neo-Vygotskian ideas such as the zone of proximal development (see Tharp & Gallimore, 1988). These suggest that the progression through the zone of proximal development goes through two stages and beyond that into another two stages to achieve mastery (see Figure 2).

Stage I is called ‘assistance provided by more capable other’. Regarding the Trondheim programme, the participating teachers and the university teacher educators are the more capable others that the student teachers observe and with whom they discuss issues. Assistance is often in the form of immediate feedback on the students’ work. At the end of this stage, teaching routines become ‘internalized, personalized, adapted and owned’ (Tharp & Gallimore, 1988, p. 282). Stage II is when assistance is provided by the self. The responsibility for the task has shifted from the ‘other’ to the self. Stage III starts when the relevant skill is automatic and the novice has progressed out of the zone of proximal development. Stage IV involves de-automatisation of performance and leads back to Stage II. The event that can trigger de-automatisation can be anything from a small change in context to major professional upheavals which de-automise an important skill. The ALACT
model (see Figure 1) can be considered as a kind of scaffold that is constructed in the zone to make it possible for the student teachers to progress through the last part of Stages I and II of the Tharp & Gallimore model.

Method. The teaching practice component of the Trondheim programme is divided into several periods: observation in a classroom (1 week), working in a class on a project (2 weeks), teaching at one school (7 weeks), and teaching at another school (2 weeks). During the 7-week period student teachers were assigned to a mentor (participating teacher) at the school. In addition, a teacher educator from the teacher education department planned a visit. As closer supervision was needed for students while on teaching practice, tele-guidance was introduced. During the teaching practice, student teachers were provided a user-friendly portable PowerBook computer, enabling them to communicate by email messages with their teacher educator.

All the email messages from four student teachers (two students of Norwegian language and literature and two students of history) and from two teacher educators were collected and analysed. In total, 42 student teacher messages (26 from students of Norwegian language and 15 from students of history) and 31 teacher educator responses were collected and analysed using a narrative approach.

Results. During the project, one of the student teachers explicitly reflected on what writing means as a tool for thinking and learning. The function that writing in itself has had may best be expressed in the words of this student teacher:

If I hadn’t had to write down my thoughts as they occurred I believe that a number of them would not have emerged. Because actually I’m thinking while I’m writing. (26 April 1996)

When I read through what I have written afterwards, still more thoughts come to mind. (9 April 1996)

The funny thing is that I may have learned equally as much from reading reflections afterwards as I did when I wrote them down. Many of the thoughts I had at that time are still developing. (26 April 1996)

Whether the student teacher is writing to a recipient or not seems irrelevant in this context. What is relevant is the writing in itself as a tool for clarification, insight and comprehension. However, in tele-guidance, the communication aspect is more important. In the Trondheim case study, the teacher educators had two main tasks: to support and encourage the student teacher, and to challenge the student teacher through a critical and provocative response (compare with scaffolding in the zone of proximal development). In their final evaluation, the student teachers teaching
Norwegian pointed out that questions from their university supervisor initiated their thought processes. Analyses of the student teachers’ messages show that an episode where one has the feeling of not having succeeded or of having come up short may be necessary in order to dwell on the episode and use it as a stepping stone to further development. One seldom pauses to reflect on the successes. It was also quite common that when student teachers felt they had failed, the failure tends to take on extra dimensions as they are inclined to search for the causes of their problems and failures in themselves on a personal level. Part of what both the teacher educator and student teacher wanted to attempt was to assist the student teacher in sorting and analysing phenomena, thereby putting the causes where they belong. Through an email conversation, a chain of reflection sometimes developed parallel to the maturing of a theme. In time, the specific episode which had been the basis for the reflection chain lay in the distant past and had therefore lost some of its impact. But it served as a springboard from which thoughts were initiated.

The Barcelona Case Study

Theoretical Perspectives on Reflection. In the Barcelona case study, student teachers’ reflections on tele-guidance were analysed on the basis of seven levels of reflection identified by Sparks-Langer et al (1990). These levels are based on three types of reflection as recognised by van Manen (1977). The hierarchy of the seven levels of reflection is presented in Table I.

In the Barcelona teacher education programme, the importance of critical reflection is recognised in the development of student teachers’ reflective processes. Student teachers have to explain how they conceptualise education, schools, teachers, learning and teaching, with the intention of examining them from a critical perspective. In this programme the topic of reflection is not only a matter of cognitive competence; it is a question of ideological competence as well.

Method. Student teachers were divided into groups of seven and they spent 3 months in a secondary school on teaching practice. During this period, they observed their mentors’ classes, talked to him or her about the school organisation, developed teaching plans, learned how to plan lessons, designed assessment strategies, visited museums with the pupils, had some teaching experience, observed their peers teaching and wrote a report on their experiences. During this time, the students had the opportunity to communicate with the university supervisor (and their fellow students) by one-to-one email for 3 months (and beyond, when their teaching practice was over). The hardware and software were provided only at the university, plus the support they needed to solve technical problems.
Seven student teachers and one university supervisor were involved. All 15 email messages sent by the seven student teachers were divided into 157 coding units and analysed using the seven levels of reflective thinking of Sparks-Langer et al (1990). Each unit took the form of a statement representing a student teacher’s main idea about experiences at school. For various reasons, 30 units were classified as ‘out of range’ (for example, the content had no important information related to school practices). Because of the one-to-one email communication, Level 1 (‘no descriptive language’) was not included in the analyses.

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Frequency (15 messages and 157 coding units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No descriptive language</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Simple, layperson description of, for example, an instructional event</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>Events labelled with appropriate terms using, for example, pedagogical concepts</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>Explanation with tradition or personal preference given as the rationale</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Explanation with principle or theory given as the rationale by using, for example, pedagogical principles</td>
<td>23</td>
</tr>
<tr>
<td>6</td>
<td>Explanation with principle or theory and consideration of context factors, such as student characteristics, subject matter, or community factors</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Explanation with consideration of ethical, moral, or political issues</td>
<td>7</td>
</tr>
</tbody>
</table>

Notes: there were 30 units coded as ‘out of range’.

Table I. Seven levels of reflective thinking used in the Barcelona case (from Sparks-Langer et al, 1990).

Results. The themes which occurred the most frequently in the student teachers’ email messages included concerns about:

- Use of telematics. Some messages expressed difficulties with using email and computers, as well as students’ doubts about the usefulness of tele-guidance compared with face-to-face discussions. These difficulties and doubts were not apparent in later messages.
- First school impressions. These messages included various topics and were characterised by general statements about the school, the school environment and the teachers. As expected, these messages were composed usually when the student teachers were involved in the teaching process themselves.
Classroom management relates particularly to questions of discipline and the student teachers’ relationships with their pupils. This was found to be one of the principal issues in the students’ email messages.

Lesson planning was an important issue in the teacher education programme and this was reflected in some of the students’ email messages.

Teaching activities refer mainly to methods of ‘putting across’ the subject rather than classroom management (all were student teachers of art).

Extra teaching activities frequently emerged in messages composed when the student teachers were organising a visit with pupils to a museum. This was an important part of their duties. These messages did not relate directly to instruction and classroom behaviour.

Social issues related to experiences in school was a topic that did not appear very often.

The relationship with the participating teacher was an important issue in the student teachers’ emails. Students mainly wrote about their disagreements with the participating teacher at school and their critical remarks on his/her teaching methods.

In addition to their writing about their own experiences on these topics, student teachers also asked advice and had dialogues with their university teacher educator. This kind of message covered some 50% of all the messages addressed to the teacher educator in the one-to-one communication setting. Student teachers had questions about the subject matter they wanted to teach and the kind of instructional and pedagogical strategies they wanted to use, and they asked for some support in thinking about school activities.

Regarding the seven levels of reflective thinking of Sparks-Langer et al (1990), the case study showed that most of the email writings covered reflection on technical and practical issues. Table I presents the frequencies of the seven levels of reflection.

Table I shows the relevance of Level 2 (‘Simple description of an instructional event’) and Level 3 as an indicator of a more complex level of reflection. Although it is important to take note of the frequency of Level 5 reflections, because these are related to the aims of the course, only two of the seven student teachers’ emails could be interpreted as covering a substantial proportion of reflective thinking at Level 5 or higher.

The input from the teacher educator was essential to the development of student teachers’ reflective thinking. He did not offer direct answers to the student teachers' questions, but tried to provide a balance between giving emotional support and suggesting alternative answers to their questions.
The Exeter Case Study

Theoretical Perspectives on Reflection. The cognitive change model (Pearce & Maynard, 1973) of this case study applies theory-related argument to an analytical process of exploring students’ teaching in order to promote a more sophisticated analysis of future events. The Exeter model (Harvard & Dunne, 1992) is based on three components:

- a psychological model developed largely on post-Vygotskian perspectives;
- a pedagogical model derived from the above perspectives, which includes modelling of typical classroom practices as the outcome of reasoning about pupils in a particular situation;
- a methodological model in which the complementary work of school and university supervisors assists student teachers in the learning process.

Structured conversations between the student teachers and supervisor are used to develop reasoning skills, particularly in learning how to teach. Their structure is guided by the use of practical argument (compare with Fenstermacher & Richardson, 1993). The process is guided by an Instructional Design Model (see Figure 3), which provides a shared framework for structured conversations. Such an argument, based on authentic episodes of teaching, aims to promote reflection as self-understanding (Bengetsson, 1995) in the areas of professional knowledge, values and beliefs. These structured conversations are a normal part of students’ work with supervising teachers in schools and with visiting university tutors.

Figure 3. Exeter’s Instructional Design Model (from Harvard & Dunne, 1992).

These sessions with the supervisor can simply be described as problem solving achieved through three phases:

- WHAT? The student teacher is invited to describe an episode of teaching in detail.
SO WHAT? The supervisor asks the student teacher to explain his or her views about the episode.

NOW WHAT? The student teacher seeks self-understanding that will support more sophisticated analysis of future actions.

Method. The 1-year postgraduate teacher education programme includes 24 weeks in schools where students engage in classroom-focused work: observing, modelling, practising, planning, teaching and evaluating teaching. This research focused on the sessions with the university teacher educator and student teachers, which formed part of the mentoring programme. Synchronous communication between the schools and university was achieved using a pair of enhanced desktop video conferencing systems linked, on a point-to-point system, via digital ISDN2 telephone lines. Both the schools and the university set up special rooms for video conferencing which allowed sessions to be conducted in privacy. Wider applications of this equipment and other forms of ICT in teacher education are described in Davis et al (1997).

Audio recordings of each video conferencing session were made and the conversations transcribed. Analysis of discourse was undertaken of six conferences between a university supervisor and two student teachers. These transcripts offered a rich data source of approximately 36,000 words, which is presented in detail in McShea (1999).

The analysis applied a unit of analysis termed the ‘exchange unit’ (Stubbs, 1987), which describes the minimum unit of interaction concerned with exchanging information. An instrument of analysis describing the mentor’s role in conferencing (Jennings, 1994) provided six categories of questioning and challenging which could be expected. Analysis of student dialogue used a grounded approach to reveal students’ concerns (Glaser, 1978).

Results. The student discourse was analysed for its content and this revealed six themes: professional issues (working with colleagues and parents, implementing school policy); subject teaching (classroom practice); children learning (pupils, responses to teaching); national curriculum (how statutory requirements impinged on classroom practice); skills of teaching (reference to university guidance notes); and research and theoretical issues (explicit references to published works or principles of teaching). Dominant concerns were subject teaching (about 40%), professional issues (about 25%), and children learning (22%). Within each of these themes, it was possible to trace the development the student teachers made in their learning and the subsequent refinements of opinion over time, for example concerning ethical dilemmas arisen from assessment and motivation issues.

The data provided evidence that the Instructional Design Model (Figure 3) endured well and that the criteria for argument (as an engagement in the analytical process of exploring events as they are perceived) achieved their intended purpose. For example, a student argued:
No, I mean the things we’ve spoken about – treating pupils fairly; the idea of equity so that you’re consistent; standard ways of starting and ending lessons; managing transitions between phases of lessons carefully. You know, they apply everywhere. At a school like ... where it’s fairly relaxed, you’ll probably find that the kids are much noisier. At a school like ..., you’ll find the kids are much quieter, but you use the same procedures. It’s just that the ethos of the school affects the way they’re implemented – but the procedures are still the same.

The last sentence offers evidence of self-understanding, as the student organises and transforms knowledge by attempting to form a general principle. Many such examples supported our assertion that the data from structured conversations provided evidence that such sessions with the supervisor can encourage a more sophisticated analysis that will support future teaching events.

Analysis of the supervisor’s strategies shows a highly focused and rigorous process of problem setting to develop student understanding. Analysis by category showed the following: questioning – to seek factual information (about 18%); challenging factual understanding (about 33%); challenging the student teacher intellectually by provoking more robust responses (28%); and instructing to clarify a point or remedy misconceptions (about 15%). One specific strategy which emerged was the supervisor’s purposeful way of pursuing lines of argument which encouraged the student teachers to revisit specific events. This allowed students’ gaps in understanding and contradictions to become apparent.

**Conclusion**

All three modes of tele-guidance had their technical difficulties. Some student teachers mentioned problems with sending and receiving emails in one-to-one email communication and the computer conferences. In the case of video conferencing, there were additional technical problems relating to the capability of the student teachers to run multiple applications and switch smoothly between them, the compatibility of transferred files, and conflicts of control when sharing documents.

In general, the university supervisors and most of the student teachers reported that the tele-guidance environment provided an incentive to reflect on their teaching. According to these student teachers, writing about their experiences forced them to think more deeply, and to be more thoughtful about their teaching. To some extent, the analysis of the discourse supports these perceived outcomes reported by the university supervisors and student teachers.
Concerns of the Student Teachers

The case studies show that the student teachers seldom paused to reflect on their successes, but frequently dwelt on their perceived problems. Problems or cognitive conflicts are a means of development. A perceived problem causes a cognitive conflict, which in turn constitutes an intellectual need which requires satisfaction through finding solutions. An obvious task for the partner in the tele-guidance environment (university supervisor, participating teacher or fellow students) is to attempt to assist the student teachers in solving problems. Another task is, paradoxically, to make the student teachers see problems they have been unable to see, acting as a ‘problem creator’ or ‘problem spotter’.

The findings of the four case studies showed that student teachers used tele-guidance to reflect upon and exchange immediate classroom practices and routines. This was especially the case in the computer conferences. These kinds of messages, and the emotional support that these messages evoked, made the student teachers feel that they were not the only ones encountering problems in teaching. Moreover, close groups were formed as a result of the computer conferences. This so-called social function of computer conferences has been found in other research (McIntyre & Tlusty, 1995; Merseth, 1991; Selinger, 1996). One-to-one tele-guidance, as provided in email communication and video conferencing, also elicited social support. The supervisor and student teacher shared knowledge and the student teacher had the possibility to ‘let off steam’. The finding that student teachers focused on their daily classroom practices and routines is in line with the well-known study on teacher concerns by Fuller & Bown (1975), revealing that the concerns of beginning teachers refer to survival in the classroom and that experienced teachers are more engaged with problematic interactions with colleagues, busy workloads and the time spent on assessing homework. Perhaps a more dominant role from the supervisor and/or other partners in tele-guidance is necessary to elicit discussion of other concerns. Nevertheless, the effects of exchanging pedagogical content knowledge on the acquisition of teaching skills should not be overestimated. In learning to teach, Hawkey (1995) suggests that the content of feedback is only one aspect, and not necessarily the most significant one. Affective aspects of learning conferencing, such as creating a safe learning environment and exchanging emotional support, are at least of equal importance.

Student Teacher Reflections

The findings of the four case studies show that the quality of student teachers’ reflection on tele-guidance was somewhat disappointing. In the
computer conferences, student teachers’ email messages were summaries of daily experiences. Interrelating themes, causal attributions and creating alternative actions are considered as essential aspects in the ALACT model of reflection (Korthagen, 1985). However, student teachers seldom showed this kind of reflection in their email messages. The results were similar in the environment of one-to-one email. In terms of Sparks-Langer et al’s seven levels of reflection (1990), student teachers generally showed simple, laypersons’ descriptions (Level 2), labelled events with appropriate terms (Level 3), and offered explanations with tradition or personal preference as a rationale (Level 4). Levels 5 and beyond were hardly observed. In the video conferences, where more intense conversations took place, the findings were mixed.

Irrespective of the model of reflection used, student teachers tended to reflect by summing up and talking about their daily teaching experiences, without showing a rational analysis of their actions and thoughts which is common in reflection. In the hierarchy of reflection outlined by van Manen (1977), tele-guidance in the four case studies consisted mainly of reflection on technical and practical issues. The third level, critical reflection, hardly ever occurred.

Supervision Strategies

The four case studies show that, in general, supervisors have to structure tele-guidance in order to prompt reflective thinking on the part of the student teachers. This was especially evident in the computer conferences, as here the supervisor’s organisational moderating was less emphasised. Paulsen (1995b) describes particular techniques to facilitate the organisational moderator function, including regular participation, encouraging participation when it is lagging, prompting frequently, taking a procedural initiative, ending discussions that drag on after they have served their purpose, and occasionally having a student teacher lead the discussion. In addition, one-to-one communication requires some structuring on the part of the supervisor. In both the email conferences and the video conferences, one specific strategy which emerged was the supervisor’s purposeful way of pursuing lines of argument which encouraged the students to revisit specific events. This allowed the students to gain a greater understanding of their professional knowledge, values, and beliefs. The structure supervisors establish in the communication depends on whether video conferencing or email conferencing is used. In video conferencing, supervisors have to give immediate feedback, whereas asynchronous email communication offers time to reflect. It could be that in promoting reflective thinking on the part of student teacher in tele-guidance, the supervisor needs time to form his or her considered response. However, student teachers were generally positive
about having immediate feedback. In synchronous (video) conferencing, the supervisors have to draw on their professional expertise in an instant.

**The Future**

We believe that tele-guidance has a place in future teacher education. In some cases, tele-guidance requires so much time that it will probably not be feasible to offer this to every student teacher, but it may be appropriate for student teachers who need guidance in addition to the individual supervision they are given at school and/or at their teacher education institution. Our experience is that tele-guidance in the case studies has also helped to combine theory and practice. Furthermore, not only have the student teachers become more conscious of teaching and learning, but so have the supervisors. The collaboration with student teachers has been to everyone's benefit.

**Acknowledgements**

The data collection and preparation of this paper were made possible by the Targeted Socio-Economic Research Programme, DGXII of the European Commission.

Support for equipment was provided by Apple in Trondheim and OLSY in the UK. John McShea's research was supported by a University of Exeter research studentship.

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