The last decade has seen immense gains in computing power available to schools and in the variety and usefulness of educational software. Professional development in the computer area has, however, not resulted in the widespread use of computers in classrooms. This article offers two mini-case studies as examples of how schools might take charge of their own professional development.

Ten years ago Ken Sinclair and I wrote about what was happening at the NSW Primary Correspondence School which had been loaned 10 portable computers by IBM. The computers were used to see if telecommunications could help reduce the ‘tyranny of distance’ for both students and teachers. The computers were supplemented by spinning-drum facsimile machines which by then had achieved the remarkable speed of transmitting one A4 page every four minutes and modems that operated at both 300 baud full duplex and 1200/75 half duplex.

The last decade has seen remarkable improvements in the power of computers, faxes and modems, and the software available to education has developed enormously. Yet, in my travels around primary school classrooms supervising students on their teaching practicum, there is little evidence that teachers are making use of the technology. The computers were used to see if telecommunications could help reduce the ‘tyranny of distance’ for both students and teachers. The computers were supplemented by spinning-drum facsimile machines which by then had achieved the remarkable speed of transmitting one A4 page every four minutes and modems that operated at both 300 baud full duplex and 1200/75 half duplex.

There is perhaps, another reason related to the issue of professional development in our schools why the technology is not being used extensively. Usually a teacher will attend a professional development course away from the school. The teacher is (sometimes) replaced for the period of the course. At the course they may have experienced something that makes them change their modus operandi or more typically, they may not. There is also little opportunity or encouragement for the teacher to pass on their newfound insights or experiences to their colleagues at the school.

The major problem with this model of professional development is that it happens in isolation away from the school context. When teachers go to professional development courses their specific needs are unlikely to be met. These needs tend to be context bound. There is little hope of the inservice activities meeting the needs of all of the teachers who attend the course unless the professional development leader has done a lot of homework prior to the teachers attending. In the mid-1980s some attempts were made by Department of Education officers to ascertain teachers’ concerns prior to their attending an inservice course. To do this a severely cut down version of the Stages of Concern questionnaire containing six questions was used. The original, which was developed by Hall, George and Rutherford (1979), contained 35 questions. This attempt to personalise professional development offerings did not meet with the success expected of it for a number of reasons, not the least of which was the validity of the shortened questionnaire.

In this article I want to argue that we need a better model of professional development, one that is context bound and sensitive to the concerns and needs of teachers. I shall do this by reporting the results of professional development endeavours at the Correspondence School.
Professional Development in Context

and a New Zealand high school. The need for a more appropriate model is especially urgent with the latest round of educational restructuring in New South Wales and as money for the professional development of teachers declines in real terms.

The New South Wales Primary Correspondence School

The arrival of 10 IBM portable computers, modems and facsimile machines presented a problem for the teachers of the Correspondence School. They had never used an IBM computer before. When the author arrived at the school in June 1985, the teachers had been struggling to get a computer and modem to contact a mainframe computer upon which had been loaded videotext screens of the usual correspondence booklets. The teachers had limited expertise in using computers. A few had used Appleworks and Multiscribe.

The initial trial involved the students contacting the videotext computer in North Sydney and downloading the material at 1200 baud, saving it to disk (floppy), completing the material off-line, printing it and faxing it back to the school. This procedure was difficult for a variety of reasons, not the least of which was the primitive nature of telephone lines in rural NSW, e.g., party lines with six farms sharing the same line, or a line into the town of Ivanhoe that consistently refused to transmit data when it wasn’t washed out by flash floods.

In consultation with the teachers and acting deputy principal of the school, the author suggested that the trial be extended to include email using Minerva (the precursor of Keylink). It was also suggested that the students be sent Logo, a word processor and an adventure game. The outcomes of these initiatives were reported in our original article (McKinnon & Sinclair, 1986). The project was then given a two week period to practice their new found skills before they too selected an apprentice and showed them what to do. The networks that were set up as a result of this approach ensured that there was always someone nearby who could help if something went wrong. In addition, teachers would teach their colleagues how to use the technology. The “each one teach one” approach was initiated by the author teaching a small number of teachers who had had prior experience with computers and who were not afraid of experimenting with telecommunications. These teachers each then instructed a colleague over a two week period. The sessions covered using the word processor to prepare email messages for uploading to Minerva, using the modem to contact the OTC computer, and uploading and downloading email messages. The new group of teachers was then given a two week period to practice their new found skills before they too selected an apprentice and showed them what to do. The networks that were set up as a result of this approach ensured that there was always someone nearby who could help if something went wrong.

Interviews conducted while this process was going on revealed that the teachers were not afraid to ask their colleagues for help. They also expressed a reluctance to seek help from ‘experts’. This reluctance to ask questions is quite a common feature at professional development courses where teachers go to get ‘injected with knowledge’ because they are confronted not only by the ‘expert’ but also a group of strangers from other schools.

The professional development course lasted a total of 18 weeks and in that time all 50+ teachers and support staff received two weeks personalised instruction from a peer and two weeks of supported exploration before teaching someone else for two weeks. The skills acquired by the teachers were practiced every day and used in a real educational context to communicate with the students. The sense of community became palpable as they acquired the skills which would allow them to talk to their own students ‘out there’. The results of the communications between teachers and students were reported 10 years ago: they were exciting times (McKinnon & Sinclair, 1986).

The client-centred nature of the professional development programme at the NSW Primary Correspondence School produced many notable results in terms of computer-mediated communication between students and teachers and in teachers’ innovative use of the technology to overcome the isolation of their students.

The Freyberg Integrated Studies Project

The second study included here reports the events in a New Zealand high school faced with massive innovation. The Freyberg Integrated Studies Project was a three year curriculum research and development enterprise (see for example, Nolan & McKinnon, 1991). The project was (and continues to be) an innovative approach to teaching the core curriculum of New Zealand secondary schools.

"...there is little evidence that teachers are making use of the technology. I still see Apple computers gathering dust in many classrooms..."
The unique nature of this Project lay in the way that it brought together and applied educational principles that have been shown by past and contemporary educational research to enhance the effectiveness of schools (see Nolan & McKinnon, 1991). The operationalisation of the principles was achieved in three ways through: (i) the incorporation of out-of-class activities as the basis of in-class studies, (ii) the development of computer applications that support integrated studies and, (iii) the creation of curriculum activities and exercises that integrate out-of-class activities and computers with secondary education objectives.

Involvement in the Project presented the teachers with a complexity of demands. In particular they were expected to implement not only a new curriculum approach but develop ways of teaching additional to, and in some cases quite different from the methods they were accustomed to using. In particular, the teachers were being asked to:

• learn how to use computers and associated software and apply these as an integral part of their practice;

• work collaboratively with other teachers in the design and implementation of the major Project components, e.g., developing integrated units of work based upon experiences and data collected during out of class activities and amenable to treatment by computer applications; and;

• broaden the conventional range of teaching approaches to include inquiry methods, peer tutoring, mastery learning, small group and individualised instruction and develop compatible classroom management strategies.

From the outset there was a recognition by the research and development team that professional development was a crucial factor for successful implementation of each of the key components of the project. In the original Project Proposal a request was made for substantial teacher release time to conduct professional-development activities: 108 teacher release days in 1987, 144 in 1988 and 180 in 1989. In reality very little time was actually delivered by the Department of Education - 30 days for seven teachers in 1987, 20 days for 10 teachers in 1988, and 20 days for 20 teachers in 1989.

The form of early professional instruction on request, developing out-of-class activities and, accompanying teachers on these activities.

Design and development of field trips and integrated sequences of work proved to be the least problematic in the early stages since they drew on curriculum areas in which teachers were confident and had some experience. With computers, the reverse was the case. The coordinator of the programme was the only teacher who had any prior experience in using computers in the classroom.

Professional development with computers during 1987 and 1988 occurred in the context of a changing computer environment and the consequent need for teachers to learn new procedures in response to changing circumstances. In summary, there were four major changes: 1) the upgrade from DOS 2.1 to DOS 3.2 during 1987; 2) the change from stand alone JX systems to a networked X! laboratory at the end of 1987 beginning 1988; 3) the introduction of the PS/2 hard drives during 1988; and, 4) the relocation of computers from classrooms to laboratories at the end of 1987 (McKinnon & Nolan, 1990).

Despite the obstacles, many gains were made. All Integrated Studies classes used word processing in most aspects of their work. All classes had applied the database and the spreadsheet to a variety of studies generated as a result of issues and topics investigated in their integrated programmes. There was a high level of enthusiasm amongst the students for working with computers.

In contrast, the teachers were diverse in their appreciation of how the computer might be used, diverse in their levels of competency and confidence in using the various applications, and diverse in their attitudes and valuations of the computer itself as an educational tool.

“Eager to make progress, but lacking insight into the dialectical nature of the problem, the initiators constructed early professional development activities to meet their own concerns rather than those of the teachers.”
It was recognised that if a higher minimum level of teacher competence and confidence was to be achieved then a different approach to professional development was required. The Concerns-Based Adoption Model (CBAM) developed by researchers at the University of Texas at Austin (Hall, Wallace, & Dossett, 1973) was selected for two reasons. First, it provided a conceptual framework for examining the process of innovation adoption. Second, it provided an empirically validated process for the collection of research data to be used for the design and delivery of professional development programmes.

During 1989, an extensive professional development programme was implemented by the author and monitored using the Stages of Concern (Hall, George, & Rutherford, 1979), Levels of Use (Loucks, Newlove, & Hall, 1975) and Innovation Configuration (Heck, Stiegelbauer, Hall, & Loucks, 1981) instruments developed for the CBAM. The outcomes of the professional development programme are reported more fully in McKinnon and Nolan (1990).

Within the CBAM the process of innovation adoption is dialectical in character involving constituent processes of feeling, action and choice. Initially individuals feel a sense of concern related to a specific aspect. Once identified the concern must be addressed in terms of specific actions aimed at resolution of the concern. Resolution in its turn involves conscious choices about further involvement which in its turn gives rise to new and different concerns.

Experiences in the project exemplified the dialectic in action. In some instances teachers’ adoption of computers was relatively unproblematic. In these cases, the teachers came into the project with a commitment to master the computer and to apply it in the classroom. For example, one teacher took a computer home during the long Christmas vacation and returned in the new school year fired with enthusiasm to apply his new found skills. In contrast, other teachers showed little enthusiasm for the project and were reluctant to spend time in learning how to use computers. With these teachers, there was a mismatch between their concerns and those of the initiators of the project. Consequently, professional development activities failed to meet their needs. Eager to make progress, but lacking insight into the dialectical nature of the problem, the initiators constructed early professional development activities to meet their own concerns rather than those of the teachers.

A further example illustrates both the initial mismatch and the dialectic in action as the dissonance was resolved. At the inception, small numbers of computers were placed in the Integrated Studies classrooms. Researchers were concerned, however, that students were not developing levels of competency and skill commensurate with their ability and the enthusiasm they displayed for working with computers. Moreover, progress in this environment was unlikely to occur unless associated problems of disk failure, student access and teacher management were also addressed and resolved. The researchers deemed it necessary to move the computers into a laboratory. In the laboratory, teachers were secure in the knowledge that they could resort to tried and true whole-class instruction and discipline methods. The physical setup of computers in the laboratory permitted the teacher, standing at the front of the class, to maintain surveillance over the whole class. While this environment appeared to encourage progress on a common front, students inevitably progressed at different rates. As the teacher responded to one individual’s needs, others either had to wait or seek help elsewhere. Typically, peer tutoring began to occur and the teacher had little choice but to accept this as a workable basis for the conduct of the class. This pattern became established and management methods were adapted. In response teachers could not but change or adapt their methods and strategies to meet the demands of the new situation.

Just as the implementation of the project was daunting for the teachers, the researchers were also faced with the equally daunting task of learning new roles working with and along side teachers in the process of innovation adoption. Moreover, being the initiators of the project, they had to learn to downplay their concerns in order to develop and maintain teacher commitment to, and enthusiasm for, the goals and approaches.

The CBAM, however, provided a useful framework within which to analyse the ongoing dialectic of change. The CBAM instruments provided important diagnostic information for staff developers. This permitted the selection of appropriate intervention strategies and tactics to facilitate innovation adoption and use while minimising the trauma of change (McKinnon & Nolan, 1990). The essential feature of these activities, however, was that they were derived from the teachers’ immediate professional needs and provided on-site both by the research and development team and by their peers. In essence, learning circles within the school community became established (Johnson & Johnson, 1988, 1992). The teachers became more adept at specifying their immediate professional needs and approaching others who could meet them.

The research and development team left the school at the end of 1989 handing over the project and the computers to the school. In 1990, the school extended the integrated studies programme to involve all students at the school. In 1992, the school executive, in consultation with the school board, decided to support the project further and bought another 30 computers. Since then another 90 computers have been installed in the school. The project continues to this day. The original 58 computers are distributed throughout normal classrooms. Some of the new computers have been located in four laboratories of 30 each while others have been placed in normal classrooms in groups of 10.

Discussion

What happened at the Correspondence School and Freyberg High School represent atypical models of professional development. In short, the teachers in both settings were faced with innovations that to them seemed massive. Rather than go off to courses that may, or may not, have addressed their specific needs, the teachers detailed their professional development requirements and had those fulfilled within the school setting either by their peers or by someone who...
had the answers. In some cases individuals were invited to the schools in order to address the issues and professional development needs that the staff had defined.

The approaches adopted at these two schools are perhaps not capable of being implemented in detail within education systems but they illustrate certain principles that inform and improve professional development endeavours.

Innovation adoption is a process, not an event (Hall et al., 1973). As teachers come to terms with the demands of an innovation their professional development needs evolve. It is unlikely, therefore, that visits to single event courses can meet the needs of all of the teachers who attend since they will be at different stages in the innovation adoption process and consequently will have different professional development needs. In addition, teachers will progress at different rates as they come to terms with the various aspects of the issues involved in the innovation. Frequent and targeted professional development is more likely, therefore, to be relevant to an individual's needs and thus more likely to bring about further change and development.

One consequence of this first principle is that professional development can no longer be seen as something that happens outside the school. The 'hypodermic approach' currently employed has little impact on the rest of the school. One teacher (typically) goes off to the course, may or may not get enthused and may or may not return to the school determined to communicate with others about what he/she has learned.

An alternative model of professional development that is gaining some currency at present is where schools identify their needs, either as a community or with the help of specialists, and invite people with the necessary skills to come and address the questions. That is to say, rather than send individual teachers to courses and for which the school has to pay, the bulk of professional development should happen within the school environment. To some extent, this approach is already happening in schools in NSW. Here, schools have a small number of pupil-free days each year (generally three) and during which time specific, or a number of, issues are addressed by specialists who are invited to the school. This approach, however, is not entirely satisfactory.

In order to achieve a more lasting impact, professional development needs to be delivered in relatively small doses over a considerable period of time and be targeted at relevant individuals. In this way, the content of the inservice materials is adapted in relation to the rate at which the teacher is ready to proceed. Professional development will come to be seen as an ongoing process rather than an activity that happens three times a year for the school and perhaps more often for a few individuals who go off to an inservice course somewhere.

In addition, the teachers within a school have a vast range of experience and knowledge that is generally undervalued. Teachers are capable of delivering a large part of the professional development activity in relation to the use of computers in education that is offered through inservice courses. This is especially true in the more isolated areas of Australia. In a survey of the teachers in 19 Central Schools in NSW conducted by the author in 1988, 61% of respondents (417) rated their peers as the most important source of professional development while inservice courses attracted a much lower 34% of respondents’ ratings (McKinnon, 1988).

In these times of shrinking education budgets and greater demands on teachers, there is an increasing need to reconceptualise how professional development can be delivered more effectively and efficiently. This article has suggested that one way of achieving this is to support schools and teachers in professional development endeavours that are initiated from within the school and which involve the school community in collectively determining the path that these endeavours should take.

REFERENCES


