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Technology Lecturer Turned Technology Teacher

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This case study outlines a program developed by a group of 6 teachers' college lecturers who volunteered to provide a technology program to year 7 & 8 children (11- and 12-year-olds) for a year. This involved teaching technology once a week. As technology education was a new curriculum area when first introduced to the college, few lecturers had classroom experience of teaching this new subject. Although the lecturers had sound personal constructs of technology education and lectured in the area of technology education, teaching this age group for this extended period was a new experience for all. The lecturers' honest evaluations document the difficulties and emotional times they encountered as they tried to implement the technology curriculum.

Background: The New Zealand Setting

The majority of New Zealand primary schools cater for children until year 6 (10 years old). In year 7, the children attend an intermediate school for two years. Intermediate schools bridge the gap between primary and secondary schools. Usually children are taught the "core learning areas" by a classroom teacher, but rotate around a variety of specialists including technology teachers. Some schools retain their year 7 and 8 children instead of sending them to an intermediate school. These are called "full primary" schools. The government supplies additional money for these children to be transported to another school or technology center in order for them to be taught by specialist technology teachers. These schools/centers are called providers. At year 9 (13 years old), children attend secondary school (Lee, 2003). In 1989, New Zealand educational reforms enabled schools to choose what programs were appropriate for their children. In the special circumstances, funding was given directly to individual schools for the delivery of technology education (Brown, 1999; Pedersen, 1997; Pole, 1992).

College Background

A basic outline of the college program is included to allow readers to gain an understanding of the emphasis, priority, and support that the college gives to students and staff of this new subject area. The college is a large institution which gains most of its funding from pre-service, in-service, and external contracts. Each of these agencies usually works independently of each other with minimal interaction. Pre-service education focuses on the early childhood, primary, and secondary sectors. Qualifications offered include diplomas, degrees, and graduate diplomas. Post-graduate courses are also offered but are currently not a major component of the college. As technology education is one of the seven compulsory learning areas (subjects) for children from 5 – 14 years old but is new to most students, the college ensures it is also a compulsory component for all primary degree and graduate diploma students. Early childhood also includes compulsory technology modules in all diploma, degree, and graduate diploma pathways. Students undertaking pre-service secondary teacher education only take technology modules if they have the subject as a major or minor focus.

Degree courses (primary and early childhood) require a technology education module -focusing on developing personal constructs - and an information and communication technology module - focusing on pedagogy and implementation - to be covered in the students' first year. Another technology education module which focuses on implementation is required in their third year, with the ability for extra modules as options also in their third and final year. Technology lecturers utilize industry and school contacts to enable students to see technology and technology education in action. As only one visit is usually possible, lecturers are frequently concerned that students do not see the entire production and can be given the wrong impression of the process. For this reason, they were keen to develop a way where students could watch and partake in the entire process without spending considerable lecture time on travel. The center supports Hansen and Lovedahl's (2004) notion that "we teach like we were taught" and that new technology teachers will tend to organize and teach their courses using models similar to the programs they completed. For this reason, they prefer students to be actively involved in their learning, allowing them time to investigate and solve problems, design and make products, and plan for implementation of the technology curriculum.

Eltis (1995) wrote, "It is essential that courses include opportunities for students to work directly with the most recent curriculum materials and gain experiences in how to implement them" (p. 97). This linking of theory and practice is critical to teacher education as noted in a report to the New South Wales Ministry of Education, where it is stated that poor teaching models have been a criticism of many

teacher education programs (Ministerial Advisory Council on the Quality of Teaching, 1998).

Literature Review

In 1999, the New Zealand Minister of Education spoke at a national technology conference of the need for pre-service providers to change their programs and delivery. He stated research had found first-year teachers did not feel prepared and confident to teach technology (Smith, 1999). Morris, Armstrong, and Price (as cited in Rogers & Cardon, 2004) state that the present American teacher education system also fails to equip pre-service teachers for the realities of the classroom they will enter. Lecturers at the college believed a major problem for first-year teachers was that they had not seen technology in action, and yet, they were expected to implement a curriculum subject that they had not seen or even experienced as the child.

Student achievement was one of the key reasons for the new partnership between school and college. The school wanted better technology education for their year 7 and 8 children and the lecturers wanted to enable their college technology education students to see and be involved in true technology in action. Most lecturers had found that students rarely saw technology in action while on practicum and few had been actively involved in its delivery. Those students, who did become involved in a technology unit, often saw craft, applied science, or construction. Lecturers wanted students to have the opportunity to be involved in the teaching of "true technology" rather than be told how it should be taught. Hansen (1993) acknowledges this *gap* or *dissonance* between what students learn in the Faculty of Education classes and what they discover in the practicum. Rarely do teacher candidates or experienced teachers ever study alternative ways to view curricula. They are prepared for views of schooling and curriculum that currently exist rather than to envision alternative and perhaps better systems of schooling and curricula (Klein, 1992). The International Technology Education (2002) wrote, "recent studies on learning [found] that many students learn best in experiential ways by doing rather than only by seeing or hearing" (p.5.). As Rogers and Cardon (2004) point out, "The need for context-rich educational experiences in teacher preparation is important in all teacher education, but is imperative in the field of technology education. Technology education demands a co-mingling of theory and practice" (p. 46). Students need to have experiences which have practice linked with theory. It is equally important, however, that their teachers also have this opportunity.

Hansen (1993) stated the case for revising technological education programs, while Brown (1993) wrote of the need to share our insights into approaches to technology teacher education. Hansen and Lovedahl (2004) stated by sharing such findings, "the hard-earned knowledge can assist others with the practices that helped and hindered the organisation and faculty" (p. 27). Stein, Smith, and Silver (1999) identified how little has been written about "the changes that are required of professional developers as they make their practices more responsive to the demands of the current reform era" (p. 238). Although the lecturers in this case study had a theoretical base of technology education, they lacked the personal experience with the pedagogical base. This undertaking would provide them with current experiences from which they could draw from for lecturing and, as such, would also serve as professional development.

Butler (1996) wrote not of the changes that are required by the professional developers but of the changes they undergo and encounter. He wrote of a yearlong professional development study completed by university staff. Initially, the staff was focused. As the program developed the staff became negative, discouraged, and did not perform as well. Over time, the performance improved, understanding advanced, and the experience was perceived as positive. Butler (1996) and Fullan and Stregalbauer (1991) referred to this apparent regression as an "implementation dip." During this time of development, the staff can often become negative and despondent. Butler (1996) noted, "If the learning event is intended to be transformational, then there must be a period when the participants are unsettled, wondering and challenged" (p. 275).

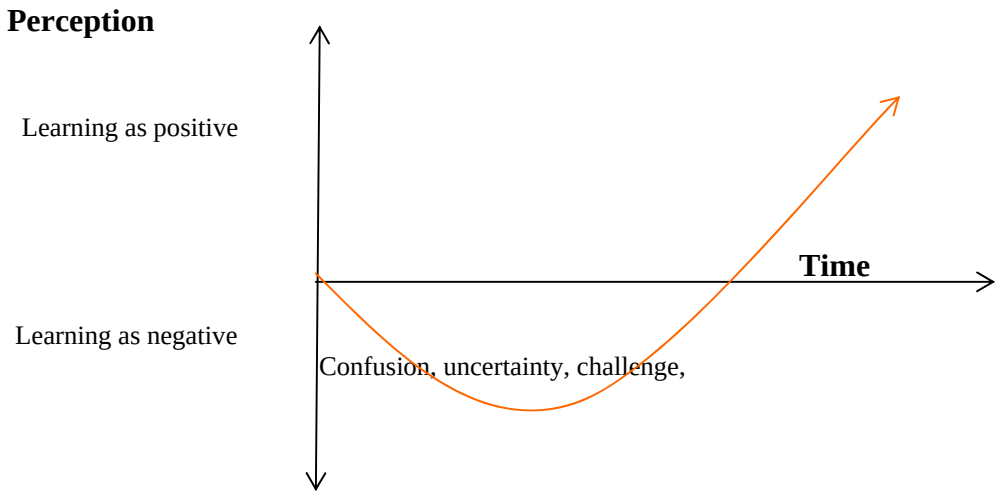
Claxton and Carr's (1991) found two "dips" in mood. People fluctuate from a negative to a positive, then back to negative, and finally to a positive attitude as the change is accepted and becomes part of everyday practice. It is important to acknowledge these mood swings when researching people's attitudes to a new situation or time of learning.

Methodology

Partnership Background

A "full primary" school (teaching 5-12-year-old children) had not been satisfied with an earlier provider and started looking for alternative technology education for its year 7 and 8 children. The school approached a neighboring college of education and a partnership was established.

Figure 1
Model of Learning Curve Showing the "Implementation Dip"



Note. Adapted from Butler (1996, p.276)

Six college technology education lecturers volunteered for the program. Staff members participating in the program were primarily doing so to better help their students learn and for their own professional development. All 6 lecturers had previously taught technology education to groups and classes of children. However, not one had taught technology education to this age group on a regular basis. Two of the lecturers had been out of the classroom for over 15 years, well before the inception of the technology curriculum. This was a considerable undertaking for staff as they were developing an approach for the implementation of the technology curriculum and committing themselves to the program for an entire year (Fullan & Stregalbauer, 1991; Treagust & Mather, 1990).

The 6 lecturers were paired to maximize their strengths. Two lecturers with science and electronic backgrounds taught electronics and control (Team A). Two lecturers with design and materials expertise taught materials and structures technology (Team B), and two with food and biotechnology expertise taught these technological areas (Team C).

On Wednesday mornings, 56 year 7 and 8 children walked over to the college to be taught technology education. The two composite (mixed) year 7 and 8 classes were divided into 3 groups. One of these was comprised of the year 7's and the other 2 of the year 8 children. This grouping allowed a lower class ratio, which Barlex (1994) stated was critical for success.

Each lecturing pair taught a series of 6-8 sessions to each group of children. The three classes of children rotated around each set of teachers. The method of delivery was decided by the lecturers. A case study approach was used as this project was a unique event that would provide rich data that might suggest themes for more intensive investigation and allow deep analysis of the many phenomena that make up an activity (Burns, 1990; Yin, 1994). MacPherson, Brooker, and Ainsworth (2000) argued that "case study approaches are significant research tools because of their ability to gain rich understandings of teaching practice and school contexts" (p. 50). This case study investigates the views of the lecturers during the first year they were involved in the delivery of the technology program to the year 7 and 8 children. It records their reactions with and to the other stakeholders of the partnership. This interaction between stakeholders "is a salient point in the characteristics that case studies possess" (Tellis, 1997). This study forms part of a larger case study examining and evaluating the program as a whole. The lecturers' views are only referred to for the purposes of this article. It is, however, important to note all stakeholders stated the program was very successful and the program continued the following year.

The researcher had "active membership" (Adler & Adler, as cited in Neuman, 1997, p.345). This is because the writer was one of the lecturers teaching the children and also researcher of the program and partnership. As these roles had potential to cause problems and raise ethical issues, consent from the stakeholders involved was necessary and the differentials in the relationship were discussed with all participants (Bell, 1992; Neuman, 1997; Snook, 1998; Walker, 1974). The practice of reflexivity (Carr &

Table 1
Questions from the Initial Questionnaire

1.	Did you volunteer to be part of this program?
2.	What do you perceive as your role in this partnership?
3.	What are your expectations of this partnership?
4.	What do you think are key aspects of a successful technology education program?

Table 2
Interview Questions

1.	How do you feel about the partnership between the two institutions, so far?
2.	Before the program started what were your expectations of those involved?
3.	How did you expect the program to "run"?
4.	Did the first 6 sessions meet your initial expectations?
5.	On the whole do you think the first six sessions have been effective?
6.	How has it differed from what you expected to occur?

Kemmis, 1986; Delamont, 1992) was used to enhance the validity of information gathered. As the sample size is small and the relationship between researcher and participant is frequent and close, the possibility of bias must be taken into account (Borg, Gall, & Gall, 1993; Hammersley & Gomm, 1997). Active membership allowed knowledge and understanding to be accumulated. It increased "the ease of establishing rapport and trust and the opportunity to acquire 'subsidiary awareness' and 'tacit knowledge.' One would expect these factors to affect both the quality of the data and accuracy of the interpretation" (Pollard, 1985, p.95).

Case studies are typically built up from multiple sources of data (Haigh, 2000; MacPherson, Brooker & Ainsworth, 2000). With a goal to reveal the participants view of reality (Lather, 1992), descriptive approaches such as interviews, observation and questionnaires were used for much of the data gathering. All meetings with lecturers to plan the program and evaluate the progress were taped in a "natural setting" (Lincoln & Guba, 1985) and later transcribed.

At the start of the program, lecturers were given a questionnaire to ascertain their goals and expectations from the partnership. Table 1 list these questions. While a criticism of questionnaires is often that they elicit shallow responses (Haigh, 2000), additional questioning relating to the questionnaire in a later interview strengthened this data.

At the end of the first six weeks of the program, lecturers were individually questioned via a semi-structured interview (Hitchcock & Hughes, 1989) to identify issues that were present at this stage. The interview protocol allowed for the initial set of questions to be presented in non-standardized ways or in a different order depending on the participants. Table 2 outlines the initial interview questions. Lecturers were asked on-going follow-up questions, thus providing an opportunity to verify the data being recorded (Lincoln
& Guba, 1985). The interviews later formed an interactive dialogue with opportunities for both the researcher and participant to ensure a shared understanding (Lather, 1992).

Lecturers were asked to complete another questionnaire at the end of the program to establish their feelings towards the program's success. Table 3 lists the questions from the final questionnaire.

Lecturers also volunteered to be individually interviewed again, at this point, to consolidate the researcher's views of the program. As an interpretative researcher working with descriptive data, the focus was on the quality of the insight from people involved rather than the number holding the view (Haigh, 2000). Emergent trends were discussed with participants.

Table 3
Questions from the Final Questionnaire

1.	How did you feel the second cycle went compared to the first cycle?
2.	Had you done anything that made it more effective? If so what?
3.	Where there any things that made it less effective than the first cycle? If so what?
4.	Do you think you taught Technology education, in keeping with the philosophy of the document? Why?
5.	If this program continues next year how might you teach it order to best keep with the philosophy of the document?
6.	Will you volunteer to teach this program next year? Why?

Examples of Teaching Units

One teaching pair (Team B) decided to team-teach. This meant there were two lecturers with the group of children at all times. As the class had just completed a weather unit, this pair developed a unit on wind vehicles. These varied in design but were basically 300 mm land yachts (similar to a racing car with a sail for propulsion).

The second teaching team (Team C) team-taught but split the teaching between before and after morning tea. This was because one of the lecturers had a pre-service teacher education class part of time when the children were at the college. Some topics were the same as the second lecturer continued on from the morning session. Other sessions were quite distinctly different. Initially, the pair got the children to make a healthy snack for an upcoming class camp. Later, one lecturer got the group to investigate the problem of childhood obesity. Children made games, promotional material, etc.

The third team (Team A) did not teach together, but rather one lecturer taught a topic and then the second lecturer built on this knowledge. One lecturer let the children make anything they wanted as long as it was made with electronics. An interesting observation was that the girls all wanted to make doorbells for the bedroom. They expected their brothers, sisters and parents to buzz the bell and wait before entering. Therefore addessing a natural need for privacy at an age when their bodies are beginning to change and they are very self conscious. The boys on the other hand all wanted to alarm an assortment of items such as lunchboxes, pencil cases, desks and bedroom doors.

Findings

Initial Expectations

Initial expectations are included because they can have a strong influence on attitude, learning, and success of the program and those involved (Burns, 1992; Eley, 1998; Medway, 1989; Owens, 1998). Lecturers had high expectations for the program and the partnership. The middle column in Table 4 lists these. Lecturers believed the children would be the major beneficiaries. One stated they would be "expanding previous ideas of technology for these children," while another stated they hoped to provide "quality education to the school children." Lecturers were confident in their knowledge of the curriculum and felt they could competently teach technology to a high standard. Lecturers' comments included "students would benefit from the time they had with us," "I expected the children to really achieve," and I "expected the children to be rapt with the subject."

The lecturers also hoped the school would form a partnership that would be mutually beneficial. They hoped they "could collaboratively plan activities and work closely together to achieved desired outcomes," provide "a collaborative link for technology education and the school," and "the teachers would have in fact established some sort of connection with us." They hoped the partnership would be an opportunity for professional development in technology education for the entire school staff, thus "reinforcing the technology program" in the school. One lecturer wrote, "I wanted to see a close relationship with the school, teachers and parents to support a quality approach to the children's education."

The lecturers were keen to develop a role model for college students who were having difficulty seeing quality technology education while on practicum. They also hoped to provide an alternative model for other provider schools. One lecturer admitted, "I guess we all thought we could set up a model for others to follow."

Lastly, the college lecturers hoped they would personally gain from the partnership. Comments about "looking forward to getting back to working with children," "developing ideas alongside children," and being keen to "trial ideas which we are teaching our teachers" are a few supportive quotes. Currency and credibility where other strong motivators for the partnership. They felt it was "important that College of Education staff can operate competently in the classroom." Comments such as having the opportunity to "gain credibility with college students and practicing teachers," being able to "put our money where our mouth is," and "my practice here at college gained some validation" were common. One also stated he/she "would enjoy myself actually and have some fun."

Data was collected over the course of the entire program. Questionnaires, interviews, and anecdotal evidence were combined in order to form a picture of how the teaching team was finding the program. Trends became evident and findings have been grouped into the initial set-up (months 1-3), second rotation of children (months 3-5), end of first semester for college (months 5-6), and at the conclusion of the year's program (end of year).

Months 1-3. For the first few weeks the lecturers appeared to be generally excited and positive towards the program. Corridor chat focused on what was done and said with and by the children. The dual role of the researcher as participant and observer allowed an insight into the group's attitudes throughout the process and not just at the key interview and questionnaire times.

As the term progressed, it became apparent that the expectations for the program and the partnership were going to be difficult to meet. The lecturers would

lecture the theory and ideals of teaching technology education and could within half an hour of the college lecture be faced with the realities of teaching children. They tended to expect the perfect situation and became frustrated when it did not occur. One lecturer stated, "the program we are running doesn't bear too much resemblance to an ideal technology education situation."

During this time lecturers commented on the following:

- The children had expectations of a traditional style of delivery and different teacher expectations of behavior. One lecturer stated, "I have had to deal with…. negative attitudes." Another stated, "I"ve been very disappointed with the calibre of the students in their attitude towards their work. I wonder whether this is general with them or whether they developed an attitude towards technology last year in their experience at their other school that has carried through."
- Dealing with poor behavior initially proved difficult. Lecturers said, "their behaviour in class is below the expectation I have and I don't think that's because I've been out of the classroom for a while" and "interpersonal rivalry and friction (between children) seems to simmer away under the surface and I felt that's got in the way."
- The lecturers had to match the college and school timetables. All classes had to finish at exactly the same time even if they were half way through a task. Later, this was altered and the children stayed at the college for their interval play.
- Integration of the program into the classroom was not possible as the lecturers had children from two different classes. The lecturers could not easily address other learning needs they identified (e.g., letter writing, cutting skills, spelling) One lecturer said, "If I had one dream, that was for technology education to be embedded rather than an add on, which I feel it still is." Another commented, "There's not the opportunity to actually extend or develop or broaden some of the work we do because of the nature of the time constraints."
- Within half an hour of teaching the children, a lecturer could be teaching adults in the same room. This meant not only changing delivery style but also the resources and physical environment. One lecturer stated, "I think we obviously had difficulties in …children coming from the school, being here and being in our classroom compared to say adults, and having the equipment necessary, when we needed it and so on."
- Absences and interruptions caused one lecturer to state, "because of their broken time with me, we didn't actually achieve what we hoped for."
- Poor communication between the college and school at times left lecturers waiting for students and projects that did not arrive. Children frequently arrived without books or writing materials. The classroom teacher rarely reminded the children of their technology homework or extra tasks. This was commented on by many of the lecturers. One stated, "sometimes children didn't always remember to bring their resource books with them." Another mentioned the importance of "ensuring the children turn up with their books, sheets and all those things we rely on so much for a continuity of learning."

Months 3-5. After 2 months, the lecturers swapped children and got another group. Most lecturers chose to teach a revised and modified version of the activity taught previously. It was at this stage that lecturers found they were "getting on top of some of the issues." Lecturers at this point noted "it is still a challenge" and "it is improving." Lecturers became familiar with the children and program and developed strategies to assist with some of the issues identified above. They stated clear expectations to the children. The lecturing group started meeting at intervals to discuss progress. This increased communication helped develop consistency as the children rotated lecturers every six weeks. The increased collegiality helped the lecturers gain confidence, as many problems encountered were common to all.

Months 5-6. After 5 months, the lecturers were a lot more positive about the partnership. They were now familiar with the program and able to adapt planning to suit that of the children and their needs. Lecturers were more relaxed at the end of 6 months and were able to allow the class more freedom. One lecturer stated, "we are enjoying the children immensely." This increased their confidence as they felt they were teaching "better technology." Many lecturers mentioned how much they had learned. There was a sense of achievement. They were aware that many of their initial expectations had not been met, but they were able to accept that change would take longer than first anticipated. One lecturer stated, "we are achieving some great things."

End of the year. At the end of the program, lecturers were asked about how their expectations had been met. Initially, they had hoped college students would watch and support them in their teaching. This had only occurred for a handful of students. Lecturers

were not bringing college classes into the rooms during teaching times. This was discussed and the reasons varied. Some lecturers did not feel confident to have their teaching critiqued during the early stages, some mentioned timetable issues, and others spoke of students' priorities of other subjects' assignments. Lecturers were, however, using the program as examples for discussion points in college classes. One lecturer was quoted as saying, "it's been an experience which has spring-boarded into our own teaching practice at college." Working again with children was one of the highlights for the lecturers. The lecturers also believed the children enjoyed the experience. They stated, "we are enjoying working with the children immensely" and "the children have been so keen to learn that it's hard to pack up at the end."

The lecturers had hoped for strong links with the school. This did not eventuate and proved to be one of the biggest annoyances for the group. Comments such as the following were common: "I think I still am really disappointed that the staff at the school haven't shown more interest in what we have been doing"; "I would have liked to see greater inter-relationship with the teachers"; and "it would have been good to involve the teachers…perhaps we're doing more and more of an autonomous program, which is not ideal."

The lecturers felt they had gained personally and professionally from the partnership. One stated that "its been rewarding for myself." All lecturers felt they had increased their teaching experience. In one interview a lecturer said, "It's allowed me to revisit some of the teaching skills that I have lost as I have been out of the classroom scene so long." Many commented on how they had to learn to adjust their teaching to this specific age group: "I think my expectations were greater than what I have been able to achieve" and "little things I took for granted when I was teaching, I assumed that children could use scissors safely, draw and design… I was really quite surprised by that." Another said that he/she had to "adjust my expectations down drastically."

Some of the lecturers were on a Ministry of Education assessment contract. These lecturers commented on the chance to trial new ideas and "to put in practice how the issues and ideas and ideals we might have about technology education." Another said, "It's allowed me to put into practice ideas I had about how one could plan and deliver technology education in a real environment, so that was really useful for me."

Working with others meant "it has drawn together staff from different sectors of the technology education center and that in itself has been quite good." One lecturer referred to how they had learned from others: "I've picked up lots of little ideas along the way by talking to people and observing other people at work."

Some lecturers commented on the increase in their credibility with their peers: "It's opportunities for us to walk the talk." Table 4 compares issues raised by the lecturers at the end of the first year of the partnership with their initial expectations. Arrows indicate where lecturers' expectations have been achieved. This table clearly shows that expectations for themselves and for the children had been met, while those for others had not. The expectations where lecturers had least control had not been met. Reasons why this may be the case are outside the realms of this study.

Discussion

Comments lecturers made in the first few months indicated that they were less positive about the program than they had been in the first few weeks. This apparent regression is quite common. As Fullan (1991) stated, "It is more likely that our competence actually decreases during first attempts at trying something new" (p.318). When comparing the results from this study to those of Butler (1996), it is evident that the lecturers progressed through an implementation dip in their development of the program (see Figure 2). It was interesting to note that many lecturers referred to the first six months as being a "big learning curve." The staff member who had "been out of teaching" for the longest period of time found it the most difficult and took many more months before positive comments were made.

The problems lecturers identified in the first 3 months were children's attitude, poor behavior, timetables, integration, absences, and poor communication. There are similar problems identified by New Zealand secondary technology beginning teachers, who stated discipline, classroom management, lack of students' motivation, and acceptance of low standards of work as major frustrations within the first six months of teaching (Mawson, 1998). They differ markedly with the results from a questionnaire sent to 10% of all New Zealand schools, which found that the most common challenges facing teachers implementing the technology curriculum were the difficulties with resourcing, equipment, finding time, and coming to grips with the new curriculum (Ministry of Education, 2003).

Although there were times when the program appeared a challenge to the lecturing staff, all identified some positive aspects. After the first few months, these started to be recognized by all involved. Bell and Gilbert (1994) acknowledged the importance of attending to three aspects of teacher development: personal, social, and professional development. The attributes the lecturers felt they were gaining from the program can be categorised into these three groups. They had worked with other lecturers (social

Table 4
Initial Lecturer Expectations Compared to Final Interview Responses

Group	Initial Expectations	Lecturers' Responses
College	▪ College students witness technology in action ▪ Demonstrate to college students that Technology education is able to be taught	▪ Few college students watched and or helped with lessons ▪ Real examples able to be given to college students
Children	▪ Child centered activities ▪ Children excited about technology ▪ Receive quality technology education ▪ Better projects ▪ Main beneficiaries ▪ Build on prior knowledge	▪ Child centered activities ▪ Excited children ▪ Quality technology education ▪ Increased enjoyment
School	▪ Collaboratively plan activities ▪ Work with whole school as team ▪ Teachers establish connection with the college ▪ Collaborative link to assist with new curriculum ▪ Up-skill teachers in understanding technology ▪ Help with planning of technology ▪ Support existing programs within the school ▪ Involve parents and the community	▪ No collaborative planning ▪ Little working with school ▪ Small groups use college facilities later in year ▪ Only one year 7/8 teacher observed the technology program. ▪ Limited interaction with parents. Many hours spent on web pages to achieve this.
Technology community	▪ Role model for college students ▪ Role model for year 7/8 providers	▪ Few students looking at practice ▪ Not seen as role model for other providers
Program	▪ Integrate what is happening in classroom ▪ Interactive	▪ Not integrating into classroom ▪ Repetition of lessons an advantage ▪ Mixed response of achievement of program
Self (College lecturers)	▪ Gain credibility with college students ▪ Trial new ideas and theories ▪ Gain experience with teaching year 7/8 ▪ Gain experience in new tech. area ▪ Gain experience in teaching technology education ▪ Have fun ▪ Working with children ▪ Be able to discuss success of new ideas with classes ▪ Gain credibility with practising teachers ▪ Stay current	▪ Improvement in credibility with college students ▪ Trial new ideas and theories ▪ Gain experience with teaching year 7/8 ▪ Gain experience in new tech. areas ▪ Gain experience in teaching technology education ▪ Have fun ▪ Working with children ▪ Be able to discuss success of new ideas with classes ▪ Work in a "real environment" ▪ Working with others ▪ Practise planning and delivery ideas ▪ Improved collegiality within center ▪ Revisit teaching skills ▪ Learning through observation, talking, and trialling

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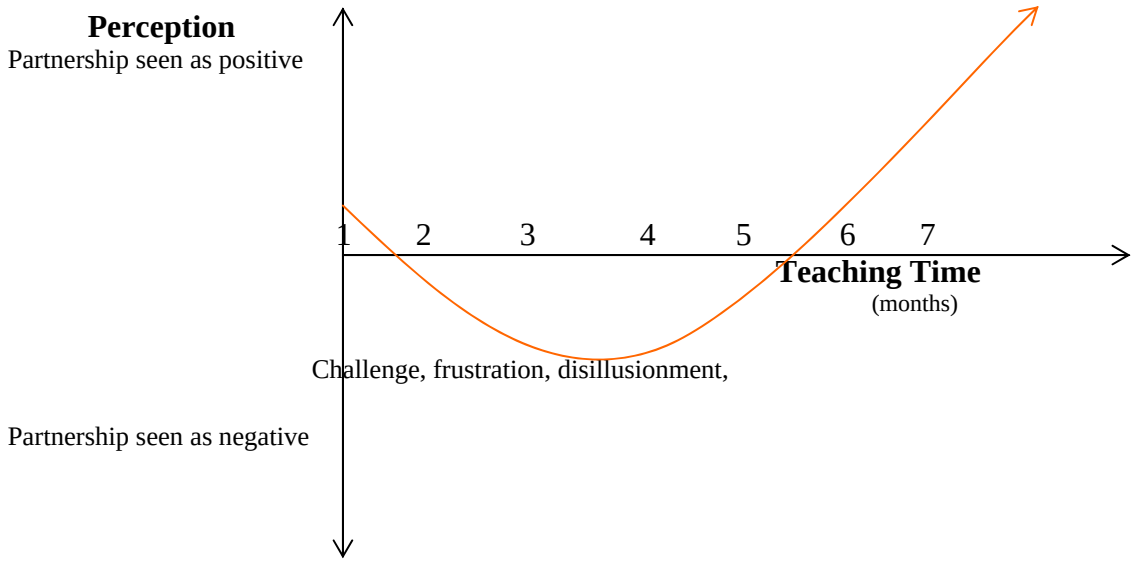
Figure 2
Model of Implementation Dip Occurring During This Study



Note.: Adapted from Butler (1996)

development); tried new ideas and changed classroom activities and techniques (professional); and challenged themselves and how they felt about technology, teaching, and the program (personal). The lecturers in this program were keen to continue the learning and work with the children in the new program. Lecturers commented on their professional development by gaining confidence and experience, learning and attempting new ideas and techniques, and noticing the increase in collegiality. Factors that are content-centered (intrinsic aspects of teaching) contribute most powerfully to teacher satisfaction (Wright & Custer, 1998). Research also shows these intrinsic motivators are the most potent (Conners, 1991).

Advice for Institutions Contemplating a Similar Program

This case study outlines the issues lecturers faced in developing and trying a new program and offers the following recommendations for any similar future programs. This study indicates that lecturers attempting new strategies experience an "implementation dip," or "big learning curve" as described by many lecturers in this study. Implementation was challenging for this team. Early stages could result in people giving up; particularly if they are unaware this is a normal process. Encouragement and support through this dip and towards successful implementation is necessary to revive passion and commitment. Those who have been away from teaching for a long period may benefit from shadowing a specialist teacher or working with the children in their home room class, so they can learn about expectations, abilities, behavior management strategies, etc. Collegiality is a critical part of any program's success (Bell, 1994; Cowley & Williamson, 1998; Fullan, 1990; Rennie, 1997). This was particularly important during the "implementation dip" (Butler, 1996). A break for staff to gather at morning-tea time, while the children were monitored at play, was included. Staff found this very beneficial. It allowed sharing of ideas, time to voice concerns, and a time for team building. Fullan (1991) stated, "If the individuals try to put the ideas into practice, there is no convenient source of help or sharing when problems are encountered. It is hard to be a lone innovator" (p. 317). Although it may appear to be a superficial part of the program, collegiality is a key component and, as such, needs to be planned for to ensure this vital attribute to the new program occurs.

Lecturing staff need to be reminded to restrict their expectations to factors which they can control. Wright and Custer (1998) referred to numerous researchers' findings which link external control and job satisfaction. Many lecturers were frustrated by not achieving their expectations related to working with the

school, college, and the technology community. They were, however, very pleased with what they had gained personally, socially, and professionally.

The program needs to empower the participants. It would help if they were volunteers and feel part of the group. They should feel their contributions are valuable to the program and are able to negotiate the content of the program. This will allow them to determine the pace and nature of the changes and feel the program the benefits of the program. The importance of this was identified by Bell and Gilbert (1994) as being a key aspect of any teacher development program.

The staff involved in this program had a great deal to do with its success. The participants were all current technology lecturers who were passionate in their desire to see the technology curriculum delivered effectively. Hargreaves (1998) stated the following:

> Discretionary commitment is found where teachers are positively engaged with their work. It is a predominately emotional phenomenon in terms of the passion that teaches have for their work….the emotions of teaching and teacher development are, in this sense absolutely central to maintaining and improving educational quality in our schools. (p. 1)

Each staff member volunteered for the program and knew that they were committed to it for the entire year, this meant when things got difficult, they had to keep going and find a solution (Fullan, 1990).

Furthermore, the program must have the support of the institution's hierarchy. In this study, the management of both school and the college made it clear that they were behind the project one hundred percent and were prepared to provide support. Wright and Custer (1998), in a study of outstanding technology teachers in the United States, found that "lack of understanding and support of technology education by administrations/counsellors" was the third most frequently cited, frustrating aspect of their jobs (p. 12). The parents, staff, and pupils of the school showed that they valued the program and the efforts made by the lecturers. One of the two main recommendations outlined in Wright and Custer's (1998) study involve, "educating the public (and school personal) about technology education" (p. 19). Wright and Custer also found the most frequently cited frustration was "lack of funding for equipment, supplies and facilities" (p. 8). This was not the case with college staff as they had access to excellent facilities and resources. The technology spaces at the college were new and purpose built and rated amongst the best in the country.

Conclusion

This study shows that with goodwill from all stakeholders interaction between primary and tertiary institutions can have benefits for all. The program outlined above included staff who were committed, supportive, and passionate. They had the support of the college, school, community, and their colleagues. The program allowed a degree of autonomy to the staff without putting them in a highly visible and threatening position. The program has allowed staff to bridge the ever important "theory/practice gap," which Rogers and Cardon (2004) stated is a "key component of this educational reform is technology teacher education faculty versed in both practice and theory" (p. 46).

Hansen and Lovedahl (2004) wrote of the critical need for higher education faculties to unite and utilize knowledge and skills to create a new future for preparing teachers. They noted, "Improving technology teacher education programs requires several coordinated efforts that leverage our collective experience and wisdom" (p. 27). They stressed the importance of technology education programs "sharing their wisdom and 'lessons learned'" (p. 27).

Even though technology lecturers are strong on theory and have ideas of how this can be implemented, doing so is another matter entirely. Anecdotes from this experience have proved invaluable to lecturers who are now able to add a realistic, personal dimension to their lectures. It is hoped this paper will encourage other institutions to attempt similar projects and to profit from the lessons learned.

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