REPORT OF PROCEEDINGS BEFORE

STANDING COMMITTEE ON SOCIAL ISSUES

INQUIRY INTO THE RECRUITMENT AND TRAINING OF TEACHERS

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At Sydney on Wednesday 27 April 2005

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The Committee met at 3.00 p.m.

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PRESENT

The Hon. J. C. Burnswoods (Chair)

The Hon. K. F. Griffin
The Hon. R. M. Parker
The Hon. I. W. West

JAMES ROLAND DALZIEL, Professor of Learning Technology, Macquarie University, North Ryde, sworn and examined:

CHAIR: Are you appearing before the Committee as an individual or in an official capacity representing the university?

Professor DALZIEL: As an individual, as an expert in the field.

CHAIR: Do you wish to make an opening statement?

Professor DALZIEL: Yes. I run a research centre at Macquarie University in the next generation of educational technology. Part of my job is to look at what are the challenges we currently face in using technology in education across all sectors—schools, universities, TAFE and corporate training—and then to try to solve those problems. One of the things that is slightly unusual about the centre I run is that while we do quite a lot of research on the problems, we also set about trying to solve them. For example, if we identify that software in a certain area is not very effective, or is missing completely, we will set about creating new software. We have technical teams who will write that software, and then provide it to teachers and lecturers to use. I suppose you might think of it as an applied research centre; we really try to take the problems of the area and then solve them.

My background is a little unusual. I am not a technology person per se; I am a psychologist by training. I spent many years teaching psychology at the University of Sydney. I moved from that into educational technologies. I spent some time in the commercial world as an entrepreneur in a start-up for educational technologies—that grew to become a successful company—and then returned to the university sector a couple of years ago to take up my current position.

If I can make an initial comment about why I was drawn to this inquiry. It seems to me that there are many challenges facing teacher recruitment at this time, but quite a significant number of them relate to technology. Given that it is the area I work in, I was keen to comment on that subject. I think technology can be a fantastic enabler of teachers, and it can do an awful lot to enhance their ability to do effective teaching and learning with their students. However, the poor use of technology can also be a real barrier—not just for the students, who get frustrated and so on, but for teachers. Many of our younger teachers now coming through are extremely adept at technology. If they find themselves in environments where the technology is perhaps not as effective as they might hope, that becomes quite a negative for them. So I was keen to contribute on that basis.

One concept I would like to introduce to start with—and I will return to it as we go along—is what has been called digital natives versus digital immigrants. It is the idea that for people under 30 or 40 who have grown up with digital technologies—computers, mobile phones, games, and so on—it is part of their natural, everyday world. They know no other world than using these technologies. They are what are called digital natives.

For those who are perhaps a little older and wiser, for some of them the technologies of this world become very much part of their lives and they become quite experienced at them, but they are immigrants to this world; it is not the world they grew up in. There are many challenges in coming to terms with these new technologies that are otherwise very familiar to our students of today, but also to our new and younger teachers, who in many cases have grown up knowing no other world than the world of computers, the Internet, mobile phones, and so on.

If I can illustrate this with an example. I flew up from Tasmania today to join you for this meeting. While the pre-flight announcement was being made by the hostess, she made the comment, "All mobile phones must now be turned off." She then said, "If any of you are unsure how to turn it off, please turn to a nearby child and get them to do it for you." For me, that seemed to encapsulate this situation of the digital natives, those who feel extremely adept with the technology, as compared with those for whom it is somewhat new.

One of the things I would comment on at a broad level at this point is that we now have not only a generation of students who are adept at these technologies but also a new generation of teachers

as they come through teacher training—and, in fact, teachers already in the work force, for whom this is part of their bread-and-butter; it is part of their everyday lives. We also have many other teachers for whom this has been new and, for some, quite challenging, and there are different challenges in trying to work with those teachers to recruit them, retain them, and support them, as compared with those who have always grown up with the technologies.

CHAIR: In our first question we asked how innovative technologies could be used to attract teachers and graduates to New South Wales public schools. You have also made the point that if schools are in fact, or are perceived to be, slightly old-fashioned in their technological ways, they will be a disincentive to attracting the kinds of people you are talking about. Therefore we really should think of it as a double-barrel sort of question.

Professor DALZIEL: Yes.

CHAIR: In terms of how the technologies could be used to attract teachers and graduates to schools, what suggestions do you have to make?

Professor DALZIEL: Firstly, I could not agree more with the way you framed the question. It is no longer that technology is a nice add-on, that if it is attractive and so on it might be a plus for teachers. It is now at the point where technology which is not of good quality is now something that actually repels young teachers. For many of them who are extremely experienced and feel very comfortable with these technologies, a lack of appropriate technology is actually a negative for them. That is not a comment on New South Wales per se; it is a comment across the world. I should say that I do a lot of work not just in Australia, but also in New Zealand, in the United Kingdom and around the world; that is part of my job. The challenges I see are the same pretty much everywhere. Some are a little further advanced, and some are a little behind.

But, in general, we are now at the stage where high-quality information technology [IT] in education is an expectation; it is not an optional add-on. Given that, we have the challenge of ensuring that what we provide to our trainee teachers and our new teachers is an environment that meets their basic requirements. Going beyond that, we have the challenge of how we use IT within education to enhance the teaching and learning process—in other words, enhance the experience of teachers and enhance the experience of learners. I think that is a key thing to consider at this point.

If I could give some examples, from the work I have been involved in, of where the use of technology is empowering for both teachers and their students. Let me give two examples from the area of science teaching. One of the problems in science teaching is that many of the experiments that you might like to run are quite expensive and difficult experiments, requiring a lot of equipment. In many cases, the key point that needs to be learnt is not the handling of the equipment per se but the concept that it illustrates. An online environment, whereby a student can run a simulation to see, in graphical terms, science being simulated can be a very effective and attractive way of students learning, and it involves much less potential cost and fewer problems of setting up real science equipment.

I am not suggesting that we should replace all science equipment with online computer simulations; far from it. I think it is very important to also give students experience with the actual materials where that is part of what is being learnt. But there are a range of contexts where the use of computers—for example, science training for experiments—where the key points can be made very well, and at a much greater cost saving, through the use of an online simulation as opposed to a physical experiment.

That is one example. The second example—and this is one of my personal favourites—comes from some work we have been doing in the United Kingdom in science teaching at a secondary level. In a particular context, a teacher who has been teaching students about the weather has been getting them to use computers in a collaborative environment to work out what next week's weather will be like and to construct a weather report, which they share with their colleagues and submit as an assessable task. To do that, the students go onto the Internet and go to weather web sites, which have live weather data and projections about the next week or two, to help the students then analyse that information, then put together their weather report, which they then put forward to their peers and their teacher.

In my view that seems to be a wonderful use of the technology in a way that we really could not have done pre computers. We could not easily have had the richness of that data, graphical maps of rainfall, cloud cover, and so on. That is now really quite easy to do. It strikes me that that sort of technology can enhance the teaching of, in this case, weather, and assist the teacher in doing that, but it also gives the students a more advanced understanding. It uses rich, live data, available over the Internet, to enhance their day-to-day teaching.

In that particular context, they have been using a system called LAMS, the Learning Activity Management System, a system that I have been involved in developing for a number of years and is now starting to be adopted around the world, including within the New South Wales Department of Education and Training. In that case, the teachers have created what we sometimes call a digital lesson plan. They have put together a series of tasks for students to work through, and the computer then steps the student through those tasks.

If the first task was to debate what they thought caused rainfall, they would then have an online chat environment through which they might debate that amongst their peers. If the next task was to go to a web site which talked about what causes rainfall, they would then be presented with the web site. If the next task was to break up into small groups and work out what was the basis of their misunderstandings about rainfall and how they have been changed by some expert ideas, and then to submit that to the class, it would run that small group task. If the next task was to go to the Internet and work out what rainfall you might see in the next week in your local area, it would provide links to the relevant part of the Internet.

The point it is that you have a series of tasks that students do both individually and in groups. The teacher effectively puts this together as an online line lesson plan, but that lesson plan is captured. Having designed that as a teacher, it actually becomes something you can share with other teachers. So if I designed a really great digital lesson plan about the weather, I could give that to a colleague, who could run it in their own classes, or adapt it to their own context and use it, and so on. This provides a very exciting possibility for some teachers to create very good sets of educational resources, these very good digital lesson plans, and then to share them widely with their peers or through a government department to disseminate them quite broadly.

This is exciting at two levels. It disseminates best practice, which we are always trying to achieve within school teaching, but it also turns out to be more time efficient than some other current methods because if a teacher puts a lot of time into creating one of these, that then can be shared with many other teachers, who can pick it up and use it very rapidly. In one of our trials in the United Kingdom context, not with weather but another area of geography, a group of eight teachers within a school got together. There were eight different lesson plans that they had to do. Rather than each teacher doing all eight lesson plans themselves, so that there would be 64 of them across the eight staff each doing the eight lesson plans, with many duplications and an enormous amount of preparation time, the teachers agreed they would each created one really good lesson plan and share it with each other, using each other's materials in the classroom.

What ended up happening effectively was that the teachers did about double the amount of preparation time on the one that they did, compared with the time that would have been involved on the one that they might normally have done, but because they were able to take up the materials of others it took them a quarter of the time overall to get good teaching resources. So the combination of innovative technologies to help with preparing lesson plans, and being able to share those, together with some careful thinking about who would share what tasks, and who would prepare what materials, and then a commitment to using each other's materials, meant that students got a much richer experience of the topic through innovative online technologies and the teachers saved a significant amount of time in their preparation, time they would not have saved if they had had to prepare everything themselves on their own.

Those are a couple of examples of where innovative technologies can really help with the teaching process, from the perspective of teachers and learners. This then becomes the sort of thing that is attractive to young teachers who have grown up with computers and are interested in these kinds of approaches and introducing them into their teaching. The lack of these kinds of innovations

becomes, potentially at least, a barrier; it holds back teachers who would otherwise want to do these kinds of innovative teaching.

CHAIR: In your first example, of the science lesson and online experiments, with simulation and so on, do enough of those exist? Is that a resource where all teachers know what they can find, and they exist at the moment, because in that case it is a little more passive; it is a matter of going into something that is available and that fits the curriculum, and there is less active involvement by the teacher, I guess.

Professor DALZIEL: I will probably comment on this more as we go along, but there are important distinctions between resources for single learners to work on their own at the computer and resources or environments that are about collaboration and groups of students working together. There has been a significant project recently called The Learning Federation. That has been an effort of States and Territories and the Federal Government to create what are called Learning Objects, that is, high-quality resources to help with precisely that kind of thing, and they have created simulations of the kind that I have mentioned. Some have been very effective and very useful. So there is work of that kind within Australia, but there is also work internationally of similar kinds, such as the UK online project and a range of others.

The challenge of creating it is one thing. The challenge of finding it is another. To date, we have been a little weaker on helping teachers find these things easily—even though we have done some quite nice work to create it. When I say we, I mean the people who have worked in this area, such as The Learning Federation. One of the areas of technical development that is urgently needed at the moment is better systems for storing, finding and retrieving these materials. A teacher needs to do a Google-like search and find many of these resources, even if they are scattered all over the world, and be easily able to take them up and use them. That is an area in which there has been significant progress, but there are still quite significant technical challenges that are holding us back in that field, and in a different context it is one of the areas that we have been doing work on ourselves in our research centre, along with many others around the world. So I think we need a more concerted effort in the store, find and retrieve part of that, but there is quite a bit already going on in that area that is very good.

CHAIR: When you say "we" in that context, are you implying that that is best done as a national project?

Professor DALZIEL: I would go as far as to say it is an international project. The challenges go beyond any one country. The need for a solution is fairly common across the world. In the United Kingdom, New Zealand and many other countries it is the same set of problems. When I say "we", I refer to the community of education developers and technologists, of which I am a part, and some of the work we have done directly ourselves in a thing called the COLIS (Collaborative Online Learning and Information Service) project, which was one of our earlier projects. The challenge at the moment has been that we know quite a bit about how to solve the problem. There has not been a lot of deployment of those solutions out into the field. That is due to a range of barriers to do with the speed at which these things are adopted, barriers in the way that new technologies are taken up within IT departments and educational departments, and across the world, not just locally. Those are the things that have held us back. There is need for a more concerted effort to try to drive that technology out to the coalface of teaching. We know a fair bit about the technical solutions needed; we just have not rolled them out quite as much.

CHAIR: Would that impact on the design of the curriculum?

Professor DALZIEL: I think it will. As teachers increasingly know there are high-quality resources that they can use to teach particular parts of a curriculum, whether it is a science simulation or part of a history lesson about the gold rush or many others that I have seen, that will allow them to rely on those resources as part of the curriculum planning that they do. One of the challenges of this area that has only been becoming clearer in the past 12 months is that it is one thing to give teachers some content resources—a piece of content that the students sitting individually at a screen will look at, click and do certain things—but the other is the lesson planning bit that wraps around it, the actual activities that you need to do around the simulation. Why would you even be interested in a simulation in the first place? What are your ideas as a student? What are your peers' ideas about why this

phenomenon happens? Until you have articulated those, you are not likely to have a very engaged experience with the actual content itself.

So what we often think of as the activities that wrap around the content have been weaker for some time, and it has been one of my personal passions to try to develop technologies in that area. LAMS is an example of a system that has taken that quite a significant way forward. I think the impact on curriculum will partly occur because of these objects themselves, but I think there will be much greater impact when we combine the lesson plans and the objects together, and then provide the two to our teachers to be able to use to suit their local needs with their students and local curricula and so on.

The Hon. IAN WEST: Professor, I have had the opportunity to see a full display of LAMS, so I probably have somewhat of an advantage. Could you give the Committee a bit more detail of what LAMS is? Being a slow-learning, recent migrant, I am interested in how this innovative technology would assist hard-to-staff schools or remote area schools, and how it might interlink with those areas where the use of technology is in its infancy.

Professor DALZIEL: If I can take that question in a few parts. Just briefly, I will tell you a bit about the LAMS software itself, so you have some concept of what that is. Typically, at this point I jump up and start doing a demonstration on a screen. I will not do that today. I want to mention briefly the way that LAMS is being provided to the sector, because I think that is an important aspect. Then I would like to address the question about hard-to-staff schools.

With LAMS we have created a digital lesson-planning system. A teacher goes into an environment where they author these lesson plans. They have a suite of tools. Imagine they have an online chat, a multiple choice quiz, a discussion forum, the presentation of content, writing notes in a notebook—a whole collection of small tasks that students might do. A teacher decides what would be the flow of tasks he or she would like to run with the students, then effectively drags and drops these into an open area, and draws lines between the tasks to create a flow of tasks. So what you get at the end of it are perhaps six, seven or eight boxes that represent different tasks, with lines drawn between them that illustrate the flow as you move from one task to the next. That shows the structure of the digital lesson plan.

It might be: I first want you to consider this question, and to put forward your idea. I then want you to vote on some options about this topic. I then want you to look at some content. I then want you to debate in small groups what you make of that content compared to your original question, and so on. That is an example of four small activities in sequence. What the teacher then does is, for each particular task, maybe if the first task was a question, he or she then types in the specifics of the question. What questions does the teacher want the students to ask? Why does rainfall occur, or something of that nature?

So, having set up the broader structure of the lesson plan, the teachers would set up each individual tool. That, then, has become a lesson plan that they can run with their students. That task I have described is something that can happen really quite quickly. We have watched teachers with minimal training begin creating real lesson plans that they use with their students that day, in a matter of say half an hour to an hour. Once they get adept at it, they can do it in say ten minutes. It is a very user-friendly and easy tool for teachers to use.

Having created that lesson plan, and saved it, that can then be run with a particular class. So they would then go to a different part of the software and say: Right, I would like to run that lesson plan with this group of students. Effectively, the software then sets up all the activities for the students to do. So, if they needed a small-group chat environment, it will set that up and allow the students to go into it. If it was to present certain content, it will then present that content to them at the relevant point. Students step through a range of tasks, with the computer acting as the facilitator: it presents each relevant thing as they go.

While that is happening, the teacher has a separate environment in which they can actually track the progress of students and see what they have been doing, whether they are getting behind or getting ahead, what the contributions of different students have been. So it is a way of seeing, in an online environment, what is the progress of the class.

I know that is only a very brief description, and it is hard to do without drawing on a board or showing you the software itself, but I hope that at least gives some example of what it is. There are a great deal of resources about it available.

Before I go to the question of its use in hard-to-staff schools, I might say the other interesting thing about LAMS is that Macquarie University and I made a decision to release it as free software. That is, the software has no cost to users. Anyone can pick it up, use it, and deploy it. It is not just free in the sense of being at no cost; it is free in that all of the code, that is, the instructions on how to run the software, is all completely public and open. So anyone can take the software and actually add new elements to it, or modify it for their context, and so on.

So, what we have done is provide a way in which there need be no barrier to those who would like to use the software. They do not have to pay money, or they do not have to be an expert in technical things. But those who want to get support, or want to add their code, have ways of doing that. The reason that is important is that if you were to use software of this kind, let us say in teacher training at a university level, if it was something that was very expensive, it could be quite unfortunate to train a whole lot of teachers in using software who then may find it cost prohibitive for them to actually use when they got to the classroom. So we felt it was quite important to try to allow as few barriers as possible, so that if you would use it in your training as a teacher you could then use it the next day in your classroom. I will not talk too much more about that, unless you would like me to, because free and open source software is a whole movement within the development of software that has been going for the last five or ten years. But, for good educational reasons, we felt that was an appropriate step.

Finally, I come back to the question of hard-to-staff schools. I think there are a few options we have using the technology. One of them is the use of videoconferencing technology. This is where the students at a remote school are able to see a teacher who is at a different physical location, and they can watch each other on a television screen. This can be a two-way thing. The students can see the teacher and ask questions, and the teachers can see the students and talk to them and ask questions of them. It is a very effective technology in certain contexts, and it can also be a great cost saver as compared to say flying a teacher out to a remote location to teach a small number of students.

There have been trials of videoconferencing within Australia. Many of them have been very successful, within both education and other areas, such as the criminal justice system. It is one of the very promising technologies we have in this field. Its one downside is that it requires quite robust infrastructure. The amount of traffic that is going over the pipes to make this happen is quite large. If you are doing this over a traditional phone line, it really does not work. You need quite significant bandwidth and significantly sized pipes to make this work. That is one thing to bear in mind. Nonetheless, there have been some very good implementations of those pipes to regional areas, so it can certainly be done. It is just a matter of rolling it out.

The Hon. IAN WEST: Sorry, that is regional—the hardware would be needed regionally, not in every establishment that you might be wanting to service.

Professor DALZIEL: It would depend on what you are trying to achieve. If you wanted a student in a very remote school to be able, within that school, to talk about these issues with a teacher perhaps based in Sydney, then you will need this infrastructure out to that school. However, if you want to use it so that perhaps once a week or for one week per month students come to a regional centre which has a lot of this technology and then you did some work there and when they went back to their schools they did other tasks that did not require it, that would be sort of an intermediate step. Both of those are possible and can be effective. It would really depend on the educational needs of doing it, the costs of rolling this out, and the limitations of it.

The major challenge to this area is the bandwidth, that is the pipes that you connect from, say, here in Sydney out to Broken Hill. That is the major problem. The actual piece of technology on site, while it costs money and so on, is not normally the challenge. That can be installed and once it is set up it is fine. It is getting that bandwidth in place and making sure it is robust enough that is generally the limiting factor on these. My understanding is that significant progress has been made on that within the New South Wales education sector. More work needs to be done but quite a lot has

been done to help with bandwidth so it is something that can really help. So that is one type of technology that is very useful.

A second one is the kind of collaborative learning environments, of which LAMS is an example and there are other systems. They are systems where students who are at several different remote locations can interact in an online environment to do collaborative tasks. This could include video conferencing but for the sake of the moment let us assume that it does not have video conferencing due to lack of bandwidth and so on. They can still discuss things in discussion environments—text based messages to one another. They can share resources from the web and so on, but not necessarily see each other face to face. They might use an audio conferencing signal as part of that; it could be over a normal telephone line. It could be over the computer. But the core of this is that you provide collaborative environments, generally text-based or similar ones, where students can interact. This means that students from many different physical locations who might not otherwise have many people to interact with suddenly get a much wider cohort in which to do things.

Again, if we went back to the weather example, if there is only one student at the level that is studying a particular aspect of weather in year 9 or year 10 in their remote school, that may be rather difficult to get inspired about. But if you are interacting with 10 other students spread around a regional part of the State, all of whom are collaborating on this topic based on a teacher at some regional centre facilitating this, that may be a much more engaging and interactive experience for those students. In fact, in that case you might even get interesting regional variations in the weather so that the mere sharing of your local experience enhances the overall learning context for the students in different places. The weather experience of a student in Broken Hill might be very different to one in Byron Bay and so on.

The Hon. IAN WEST: And you may have the reverse effect. The recently arrived migrant would think that this technology is not good for interpersonal skills yet in remote areas it might be the reverse.

Professor DALZIEL: That can certainly happen. There is interesting debate within the technology field about using technology as a basis for interaction as opposed to face to face or human communication, and perhaps I might talk about that a little later. But certainly where you have no other option, where there are few students in the physical location, providing means for a greater number of students to collaborate can be very positive. I can give one example of that. Within the current trial of LAMS that is happening within the Department in New South Wales there is a science teacher based at Gosford called Dr Mark Butler, who is an award-winning science teacher and very highly respected.

One of his passions for using this technology is to provide very good quality science teaching out to regional students who might otherwise not have as rich an access to high quality science teaching. He wants to do that not only to help students but to help teachers so teachers in regional areas who might have some science teaching skills but perhaps not the very best possible—he wants to work with them as well to help provide these lesson plans that he has designed out to them to use but also to facilitate collaborations online for students who might not otherwise get as rich an experience. Personally I find that a very exciting example of how to bring together some very good technologies with some good sound pedagogy to create potentially an even better learning environment than we would have had without the technology.

CHAIR: How much of what you are saying applies to those schools described as hard to staff not because they are isolated—somewhere between here and Broken Hill—but for a variety of other reasons and tend, therefore to find it hardest to get teachers like science teachers, maths teachers and people with good IT skills? Is most of what you are saying applicable to them as well as to the smaller, more isolated schools?

Professor DALZIEL: Yes. I think the exciting things about those technologies are not limited to rural or regional schools. They can apply in many contexts. It is just a matter of the will and the interest to do so. Schools that for whatever reason may have—to take our example for today—not very strong science teaching capability might be able to rely on the science teacher one or two suburbs over using an online environment to work with their students to provide a richer context for them, particularly where perhaps the demand is not there at the higher level**.** If you have some specialist

courses where there are very few students and they are scattered around quite a bit, this provides a way of giving them a richer learning experience than they might otherwise have. So yes, it has enormous potential.

One of my favourite examples from the university context—if I can digress briefly—is an example of this kind of collaborative online technology where students were debating politics and in this case Middle East politics and debating the challenges of certain scenarios. The students doing this were from around the world, students from America, Australia and the Middle East, all together in an online environment debating the problems of this. So the richness of the different perspectives coming from students from different places made for a fantastic learning environment that I think would have been far richer than if you just had a tutorial of 10 or 20 students all from Sydney. The range of perspectives they might bring may not be as rich as if you had students from around the world. Similarly, there will be contexts even just in New South Wales where having students from a range of cultural or socioeconomic backgrounds interacting online actually brings a richer learning environment than they might otherwise have if the school they are from is from a particular slice of society.

CHAIR: You said before that you wanted to make a couple of comments relating specifically to training. In terms of pre-service training programs, I suppose you would argue that they need more training in the use of technology in classrooms.

Professor DALZIEL: There is certainly a need for greater professional development in this area. To me there is no question of that.

CHAIR: In the pre-service area as well.

Professor DALZIEL: In pre-service as well as teachers currently working in the field. It is worth saying that many of today's pre-service students have strong IT skills in their own right. They are the digital natives that I talked about. So they come to this sort of context with a reasonable level of skill in the use of a web browser, an email system, a word processing package. What they do not get as much of as I think we could do is actual pedagogical use of the technology: How do you do this to facilitate interesting learning interactions and so on, as opposed to just using technology for the sake of the technology? We have some problems at the moment which result from teachers who use, say, word processing for the sake of learning how to use a word processor, which is an important skill for students to learn. But if that is all that is learnt, and it is not then a basis to debate the ideas contained in the document the student created perhaps, then I think we have sold our students short. There is more we can do in that way.

One thing is to move beyond using IT for the sake of IT skills themselves and to move it into the heart of the curricula. One phrase that is very common at the moment in the United Kingdom around this area is “embedding ICT throughout the curricula”. That is, the use of ICT is not merely to teach ICT, computers; it is about using it all the way through the curricula wherever it is appropriate as a tool. One example I would like to give of this again from the work that I have been involved in with LAMS is a case where just recently at Macquarie University we have had a context where pre-service teachers have been using LAMS within their university course. They initially act as students within a set of tasks that their lecturer creates for them.

The lecturer comes in, creates a set of tasks in LAMS and gets the students to use those to work through as if they were students; debating, say, what makes an effective teacher, if that was the topic. Having done that, the students have had the experience of being students within one of these online learning environments. The next task the lecturer then gave them was, "Okay, I now want you to imagine you are going to use this technology with your own school students. How would you design a set of tasks yourself to create a good learning environment?" So it reverses it; having been students in the environment and learnt from that experience, now they become teachers, authors, and create their own materials. They then share them within the class and they provide feedback to one another and comments. In one case they use it as an assessable task for the university course.

The final step though—and this is the one they love—is that a number of those teachers have then taken the thing they created in their university course and used it with students the next day, the next week, the next month out there at coalface teaching. I find that very exciting because it is creating

a sort of virtuous circle or cycle between acting as a student in an online tool yourself during pre-service training, then learning how to use that to teach other students within that context, and then actually taking that right the way down to use within the students. So that cycle is a very positive one. We have seen from the early trials that it is very successful. The teachers enjoy it; the students love it. They really enjoyed the technology in the classroom. That is where the role of free software or open source software as it is called is very attractive because the tools they learn to use at university are just as freely available to use in their schools as they are anywhere else. It is not as if there is a licensing fee or enormous costs that stand in the way of them doing that. That is true of LAMS and a number of other technologies—I would not want you to think that it is just about this particular project I have been involved in. I think that concept has much to recommend it, and the early examples of that have been very positive.

CHAIR: Is the pre-service teacher training program as overcrowded as the school curricula? Is there a problem of all the things that would-be teachers have to be taught and a need to try hard to squeeze them all in?

Professor DALZIEL: I can only speak anecdotally at that point but my sense is that there is an awful lot to get through in the training itself and an awful lot of curricula as well as teaching techniques and so on. So there is a great deal. The question I would pose is: Is the current balance of the use of IT within that pre-service teaching appropriate to what they will be doing in the next five, 10, 20 years of life as a teacher? I would say no, that we need more experience and training in the use of IT, particularly for the purpose of the pedagogy, not the sake of just using it for IT skills. That is an area where I think we could do a great deal more. As universities—if I can speak as a university—there is much we could do to enhance that but, equally, I think there is also at the school level, if there is a rich technical infrastructure, if there is a lot of good support, then the good things learnt in pre-service training can then be taken easily into the classroom. So there are things in both areas that we can do to improve that.

CHAIR: Do any of those have any notable variations, depending on whether a would-be teacher will be primary or secondary or will be in a science or maths area or an English history type area? Is there any real variation, or would you argue that the technologies need to be used in just about every area of the school?

Professor DALZIEL: There is variation but it is not a variation of amount; it is a variation of type. The sort of things you might do with technology in primary education may be different at times to what you might do in secondary education. The sort of things you might do in science may be quite different to what you do in history. But the need for a greater degree of training in use of that and the practical experience of actually doing it, I think there is more of that needed across the board. That would be my sense.

CHAIR: You have probably told us the answer to the question about the benefits to students of having teachers appropriately trained.

Professor DALZIEL: If I could just comment on that briefly just to give a few examples of this. As I said, the digital natives, this is their experience and there is a quote from one of our trials in the United Kingdom which has stuck with me very strongly. This is in a secondary boys school in a difficult area on the outskirts of London, many low-achieving boys, many challenges in that school. The introduction of technology there has just had a transformational impact on that school and on those boys, and two things have stuck with me. One is that I remember a quote from one of the boys—I think he was about 14 or 15—saying, after having done some of these—he had been debating ideas with his peers online and looking at materials, and the weather example comes from that school. He said, "It's like you brought the rest of my life into the classroom."

What he meant is that all through the rest of my day I am using computers. I am sending text messages on my phone. I am playing games. The digital environment for me is very rich outside school and I come to school and I actually feel like I take a step backwards. I sit in this rather dull old-style mode of education. When you give me technologies—when you bring these technologies into the classroom—many students really come alive. So that is one exciting thing to be aware of.

Another example from that school was before they introduced LAMS in this case they asked the students in a survey: "When the teacher asks you a question from the front of the class and you know the answer to that question, what do you typically do?" Only about 16 per cent of boys were willing to say the answer that they knew. Something in the order of 45 per cent of boys would not answer because they did not want to look like a square. About 40 per cent of the rest would not answer because they were too worried that they might get it wrong. That is a significant problem in its own right and every teacher I think knows the experience of the silent classroom when you ask a question.

Several weeks later, having used the technology to ask a question so that every boy was asked the question, was able to put forward a response and then could see on the next screen all the answers collated so they could see all the different ideas that their colleagues had put forward, they said to them, "How comfortable are you putting forward your ideas when you know them in this context?" Something like 85 per cent of the boys said, "I would be happy to put forward my ideas then." It was quite transformational in the amount of interaction as a result of introducing the technology. That, for me, is an indication that many of these technologies are very much part of the daily lives of students and it is only a matter of bringing them into the classroom and you see this wonderful thing happen.

The other part of that story which I find exciting is that teachers then commented that although that was using the technology to interact, they then saw in the next month or two the classroom interaction started to increase. Because they got more interaction and more ideas being put out when they were online that then partially transferred back into increased participation in the classroom. It was not 100 per cent transfer, but instead of 15 per cent it was getting towards 50 per cent of boys being willing to put forward an idea back in the classroom. That is an exciting bit about where the technology transforms the students' experience. The issue then for teacher training is to ensure that teachers have tools that they can use to do that and that they feel comfortable using them—they have the experience, training and expertise to take that into the classroom.

The Hon. ROBYN PARKER: You might have answered this question before. You have those steps in place and the issue then is what those teachers in training are using technology-wise translated to the classroom and the technology that is available there. In an ideal world it would be a crossover with the same technology throughout, but that is not the reality. How do you get around that?

Professor DALZIEL: There are a couple of parts to that problem. One is that those of us who design the technology should try to do it in way that is as easy to deploy and use as possible. One of the simplest parts of that these days is that things should run through a Web browser so there is no need to install complex software on all the machines and so on.

The Hon. ROBYN PARKER: So they do not have to have compatible software.

Professor DALZIEL: That is right. If they can get onto the web, that allows them to get to the software they need to use. That is typical of a range of software development these days. It is at the heart of our LAMS development and many others. That is one piece of the problem. The second one is the technical infrastructure in the schools. There are three ways I think we can think about using computers in schools. One is that the teacher has a computer and is able to use it themselves for preparation in their teaching and potentially in conjunction with a projector or an interactive whiteboard. So the students themselves do not use computers but the teacher is able to use a computer to project content, ideas, tasks and so on. I think that is one very important area that we need to try to support.

The second one is that, particularly in Australia, there has been a great deal of trying to have a few computers in each classroom so that they can be used and, typically, you would rotate students around them. That can be very effective in certain contexts but in my experience some of the most powerful experiences from the classroom come from collaboration and you need more computers than just two or three to do that in a very effective way. That then brings us to the idea of the computer lab. You have a computer lab or labs somewhere where you have at least one computer between two students—so about 15 computers—or even one computer to each student, up to 30 computers. You maintain that in a well-managed environment where teachers effectively book that room, come in and

use it and are able to come out of it. That is much more common in the United Kingdom, in my experience, than in Australia. There is certainly quite a lot of it in Australia but there has been more of a push in Australia towards having a few computers everywhere than aggregating them so that they are usable in a lab context.

My personal view is that I think we could do a lot more through the judicious use of one or two labs per school then we get from scattering a few of them around all the classrooms. Quite apart from the pedagogical benefits that arise from collaborative tasks and so on, it is actually also easier to manage. Having all the computers in one place and looked after is an easier technical challenge than having a couple of them scattered in every place where they can easily have problems, break down and so on. Personally, I would encourage at the technical level of infrastructure to think a lot more about providing schools with at least one lab of computers, if not two or more, and not as much of a focus on a couple of computers per classroom. I do not think we get as much bang for our buck from that approach.

The final thing I will touch on is the issue of professional development for teachers. I would be of the view that those teachers, particularly older teachers—the digital immigrants—who are not comfortable with technology, who find it quite challenging and hard to understand, should not be forced or strongly encouraged to use it when they do not see the benefits and when they feel very uncomfortable. I would feel that we should do things that are attractive and would entice those teachers to consider it but certainly not use any kind of a big-stick approach to try to force teachers that way. On the flipside, I think that any teacher who wants a computer to be able to help them prepare their materials and then use them I think we should strongly try to support. I do not know whether that means a laptop for each teacher or a desktop computer, there are arguments in favour of each. I personally think laptops have the greatest flexibility in terms of being able to move around and so on, but either one.

My sense is that many of our teachers out there—particularly younger teachers—who would like a computer to use on a regular basis with a network connection so that they can access the Internet generally and also their local school and State network, there is a lot more we can do to support them. There is quite a lot of work within the Department and all around Australia to do it but I think we can do even more in that area. I suppose my encouragement is that we should do everything we can to assist those who are keen to do it. For those who are not so keen, I do not think we should push. It is much better to be drawn to it because of the benefits than through some sort of sense that every teacher should use laptops in the classroom. I would not encourage that, particularly if they are uncomfortable or they need professional development to get there and so on.

My sense at the moment is that there is a significant need for further professional development in the use of technology for our coalface teachers. There is really no question of that to me. They need more time to work out how to use the technology to suit their teaching and their students' learning. The upside to that investment—the investment up front in both training and in time release to help prepare materials—is the kind of thing that I mentioned before when eight teachers banded together. Each created one lesson and then shared them with the others and they saw an enormous benefit in the preparation time and an increased benefit because they put even more time into the one thing they created. It is not that we require massive investment for which there will be no payoffs later down the track. I think there can be some very significant payoffs, reduced preparation time, high-quality materials and so on. But in my mind there is no doubt that we need more professional development in using the technology and in time release for preparing curricula using the technology.

CHAIR: We probably should have allowed more time for this hearing, but it is always hard to estimate. Our next question is about how the department—and we probably should add the new Institute of Teachers—can ensure that the kind of teacher training that people are getting is up to date and is matching the school. You talked about the schools needing to have the equipment and so on that people have brought with them from their training. But I guess it can be argued the other way as well: How do we ensure that universities and so on are keeping up to date and providing the sort of training and technologies that schools need?

Professor DALZIEL: Because, as I mentioned, my background is as a psychologist—I have taught psychology at a university level for many years—there is a very rigorous assessment process

conducted by the Australian Psychological Society of visiting all the psychology schools and assessing their programs and so on. That is my discipline background. I do not know enough of the details of the way that is done at the moment in the relationship between universities, schools, the department and so on, but my sense is that there could be greater co-ordination and greater involvement. Certainly in this technology area there is a lot that can be done to share ideas of "If you are using kinds of technologies in the training how can we support those when you come to the schools?" If we are providing these technologies already in the schools and you're not educating people about them in universities we need to make that link. I think more could be done to connect the dots between the two halves to ensure that we are getting the best benefit.

While there is an important role for both proprietary and free and open software within that context, one of the attractive things about the free and open software is that there need be no impediment in its use. Similarly, when a State has a State level licence with Microsoft for a range of Microsoft products, that is very encouraging because then the Microsoft products that can be used at a university level can be assured to be available when they get to the schools to use them. So in both of those contexts—whether it is free software or proprietary software—it is about linking the tools that become familiar at pre-service teacher training with the same tools that can be used and benefited from within the schools.

I think it is worth saying that part of my emphasis today is on what can be done at the coalface of teaching nd learning and less a comment on the training of our teachers themselves. I have great faith in today's young teachers. The ones that I see going through university training are very adept at technology. Many of them adore it and it is part of their everyday lives. That is not true of all of them—there will be those who are not taken with it. But there is a great wealth of capability there that we could do more to take advantage of. That is my sense. So I think there is much we can do to further enhance teacher training within universities but if we can link more closely what they are learning and able to do with what they can then implement in the classroom I think that is where many of the greatest benefits may come.

CHAIR: That brings us to a question about the kind of training that can be provided for teachers who are currently teaching, many of whom I guess you would describe as digital immigrants, who are perhaps struggling to keep up to date. What sorts of professional development strategies do you think we should be looking at?

Professor DALZIEL: I think that is a significant challenge and one that is often underestimated. In my work around the world whenever we tend to be involved in introducing new technologies in schools and so on, there is an assumption that the students might struggle to get their heads around this new technology but the teachers will be pretty all right—we have given them a lot of training; they will be fine, and so on. The truth on the ground is the reverse. Today's school students have no trouble whatsoever getting their heads around the technology but many teachers, particularly the digital immigrants, find it challenging to understand. I think we need more opportunities for professional development and more potential to use the technology. But I would strongly encourage it from a pull basis rather than a push basis—that is, create attractive options for teachers to learn about the new technology. They can get their own laptops to use and work on at home, and so on, rather than a push approach: "Thou shalt use technology in the classroom" and everyone must do that. I think that is one important aspect of it.

I think a second one is that there is a lot we can do to encourage teachers through very small and modest things that help this work. I know of a lovely example where for a long time the school had provided its daily or weekly newsletter to teachers in a printed format and they decided that they would start to send it around only via email. So the teachers were then drawn to using the email for a very simple thing. Those who could not still printed it off but for the majority of them it became an attractive thing to help them use the technology a bit more. There are a number of contexts where you can do very simple things to draw teachers to getting started or using the technology that then provide a basis for further things in the future. But if they are not given notice to get started you never start the process.

The other thing—and this is one that I am also very passionate about personally—is that a number of the technologies that we as the developers of technologies have created over the last five or 10 years have not always been as easy to use as they should have been. The interfaces and the way

they work are quite difficult for teachers to get their heads around. That then leads to very large costs in professional development. If it takes five days of training to learn how to use a learning platform, then when you scale that up to 10,000 teachers that is a very expensive cost. I think there are some very useful things that we on the technology development side can do to make much more intuitive interfaces—things that feel far more natural for teachers and, hence, as a by-product become much quicker in their take-up and much more easily understood.

Certainly in our work on LAMS we have worked very hard to create an interface that is intuitive and easily understood by teachers and the feedback is that that is the case. Quite apart from the benefits of using that, you then have potentially a less burdensome professional development cost to be borne: You know, if it only takes three days to learn the technology instead of five, you then look at the scale of what that means and that is really a very significant saving. I think that is another thing that we can do on the technical end to help this. The easier are the tools that we provide to teachers, the greater is their confidence to use them. It makes the training time less which ultimately also reduces the cost of rolling it out.

CHAIR: Traditionally we ask people what they would like to see come out of this inquiry. I think you have already told us quite a number of things, but do you want to round those out with a general statement?

Professor DALZIEL: Yes, just very briefly. There are two key things I would like to say. One is that the use of technology is a given rather than an optional thing. I started with that point and I really reaffirm it now. We will lose good teachers through a lack of good technology. It is not just that good technology will draw them in. It is a two-edge sword, as we discussed. I think there is much we should try to do to actually enhance that experience for teachers so that it becomes something that draws them into teaching as a profession and does not repel them. I think that is actually a key point. I believe that we have done much work in that area across the world and particularly in New South Wales. We have done much to try to help that, but there is still a lot more we can do, so that is quite important.

The second one I want to comment on I have not said as much directly about, but let me say briefly that we need to provide a way of doing innovative things with information technology [IT] within very large departments of education. This has been one of the real challenges. In a case like New South Wales, which has such a large department, it often becomes very hard to do small innovations because the problems of IT management tend to be viewed as an all or nothing type of thing: You either do something on a massive scale and investigate all the issues and do it, or you do not do it at all and you leave it aside. What we need is more potential for sort of test beds, for pilots, for sandboxes—you know, the sort of place where a small number of schools can trial technology to see how it works as a basis of then deciding whether it is worthy of further rollouts and so on.

In our recent experience with the Learning Activity Management System [LAMS], the department has been doing that and it has been very successful, but I think there is a lot more that we could do in New South Wales and elsewhere around the world to provide, as I said, sort of test beds for trying out innovations where we are not saying, "This is for the whole sector and every teacher will use this technology", and so on, "but we do want to try something out and give it to 10, 50, 100 teachers and learn what it does, to give us an informed view of what we might do." I think that is an important challenge we have at the moment in New South Wales and elsewhere.

It is a critical role for recruitment of teachers that young teachers who see innovation going on within a place would be drawn to it. They would want to be part of that where that is an attractive thing for them. If they like technology and they like the potential for innovation and they can see at any one time there are three, four or five pilots of innovative technology areas within the department, that will be something that attracts them to it. On the other hand, if we do very little innovation within our State or country or wherever, then I think that becomes a potential block for new teachers. So we have to try to get that balance right again of supporting the innovation as something to attract new teachers and avoiding a situation where we do very little innovation because of all the IT challenges of doing so—and they are significant. But by not doing innovation, we perhaps lose our best and brightest or many of the younger people who would want to join us in teaching.

CHAIR: You have given us a lot to think about as well as those who will hopefully read our report when it is completed. We may need to follow up certain things with you. I hope it will be all right if the secretariat wants to contact you.

Professor DALZIEL: Certainly.

CHAIR: Thank you very much for your attendance today.

(The witness withdrew)

TERENCE LOVAT, President, Australian Council of Deans of Education, c/- University of Newcastle, sworn and examined:

CHAIR: Do you want to make an opening statement, or enlarge on your submission before we go through to questions?

Professor LOVAT: No.

CHAIR: We have grouped our questions first under recruitment, then training and so on, as you know. The Committee members from time to time will ask about various other things. To start with, what could be done to improve graduate recruitment?

Professor LOVAT: Graduate recruitment as in movement from the institution of training into school?

CHAIR: Now that you mention it, that is slightly ambiguous. We probably mean recruitment, basically.

Professor LOVAT: Into training?

CHAIR: Into schools in the end, I guess, if that means also improving the types of people that we are getting into university prior to teaching service. It is both, I guess, but we are looking at the situation where there are shortages in some areas, and there are comments about the quality of teachers going to some areas.

Professor LOVAT: To take the first one first, the recruitment of people into teacher training, it seems that it takes a long time for a good story to be overwhelmed by the facts. Just within the last week I saw in one of our major newspapers in article that was full of assumption—that in actual fact we have huge difficulties in getting good people. It was meaning good academic people, and good Higher School Certificate [HSC], et cetera, graduates going into teaching. Nothing could be further from the truth.

It is several years since universities have had that particular problem. Indeed, this year was probably an acid test because a lot of extra teacher places were made available, courtesy of the higher education reform—in the case of my own university, about 20 per cent extra places. So we had a 20 per cent extra intake into a program that already had very, very high universities admissions index [UAI] cut-offs. The movement in UAIs was nothing more than a blip, basically, that took us back to where we had been the year before. There would be very few innovative programs that would be robust enough to take that sort of extra intake without a huge negative impact on UAI cut-offs. It is a good example to show that we actually do have a very robust movement from particularly the schools but also with mature aged people into universities.

At my own university, virtually every one of those who took up teaching this year could have gone into engineering. A lot of them could have taken on law and some of them could have done medicine, and certainly every single one of them could have done accounting. Those are all professions and professional training regimes that only a very few years ago would have been 10, 15, 20 points above teacher education. It is a very important point to make that all of the campaigning that has been done on the part of systems, teacher unions and universities to make teacher education attractive, strong and fortified in the way that 25 years worth of national, State and Territory reviews have recommended means that we have got there. It is very important that that is recognised as a starting point and that we kill off the myth. It is a dangerous myth because it can become perpetuated.

CHAIR: Self-fulfilling.

Professor LOVAT: Yes, self-fulfilling. If parents read a newspaper article that says, "Teaching is easy. It is not worth going into," they communicate to the kids, "Don't do that." We have enough difficulties that way, even when it was true, but we cannot let that one perpetuate. So that is that one. Then the movement from the academy, if you like, into the professional field brings on a raft

of other issues. There are difficulties. There is a lot that will lure a young teacher graduate these days away from the local system. One of the things is the international recruiters who are here in earnest.

We have the United Kingdom Government with a deliberate policy to move 10,000 Australian teachers over the next five years to the United Kingdom to shore up shortages that have been created there through a pretty awful approach to teacher education and, indeed, the profession generally. Interestingly, and I have had direct contract with the people in the United Kingdom, there are much, much cheaper teachers, many cheaper teachers to be had around the world to fill shortages. It is the Australian teacher that the United Kingdom particularly wants—top of the pops. Canada and New Zealand are right up there, too. But almost all of the recruiting people will tell you that it is the Australian teachers they want, particularly the young teachers, because they see them as being trained in a way that certainly in the United Kingdom they have almost forgotten. That is a very attractive alternative for a huge number of young people, particularly those in the sensitive areas like maths and science technology.

CHAIR: That is a relatively new recruiting effort, is it not?

Professor LOVAT: Yes.

CHAIR: Do we have any statistical picture on how effective it has been?

Professor LOVAT: For them?

CHAIR: Yes.

Professor LOVAT: Quite effective. I mean I could not rattle off numbers, but you would not have half a dozen United Kingdom agencies advertising regularly in the press and setting themselves up in Australia and taking trips out here regularly if in actual fact it was not working.

CHAIR: Would it be the kind of thing, as is traditionally the case, where young Australians go to the United Kingdom for a relatively short period and then come home again?

Professor LOVAT: Yes. Obviously, the recruiters are using that angle—that drift, if you like. Perhaps in that regard the drift to the United States is an even more interesting one, particularly if you consider the sorts of former visa arrangements for working in the United States. An Australian could not sell a box of matches on a street corner in the United States—and still could not under normal circumstances—but these days it is not uncommon to find Australian teachers being given things like five and six year working visas and being set up in places such as very, very nice schools in South Carolina, et cetera, with good wages, good accommodation and support, et cetera.

The Hon. ROBYN PARKER: The question is that they are putting a package together and attracting our students, our graduate teachers, over there.

Professor LOVAT: Yes.

The Hon. ROBYN PARKER: The travel and the different environment is part of that package, but there are other parts of that package that you have mentioned. Is that tipping the balance of those graduates—the good schools, the good accommodation and those sorts of things? In other words, is there any research done on what is actually making those students, those graduates, go?

Professor LOVAT: Again, anecdotally, the ones who will pop into your office and say, "Hey, guess where I'm going next year?" The money: they can make much more quickly far better money; something like an assured visa arrangement for five or six years—I mean particularly for the States it has a lot of prestige to it; the adventure, obviously. It is a double-edged sword for Australia. It is clearly part of what contributes in the short term to shortages being experienced, and what I have found is that there are young people who will in fact go and teach in fairly isolated parts of, let us say, the United States who would not have gone to teach in more isolated parts, probably, of our own system.

So there is a mystique and the grass is greener, plus the cash. It is a negative in the short term for issues of shortage but, interestingly, it is probably the number-one thing that people will nominate as the reason they have gone into teaching, particularly those with lots of choice, those who could have done engineering or accountancy or law or whatever, that they have noticed that the world wants you, and this is a good thing to do, there is an international practice in this, there is a ticket around the world, et cetera, et cetera, et cetera. So it is actually part of what is creating this situation where most of us in teacher education these days are knocking back at least as many as we are taking. We could double the numbers if we had the resources and the university places for the demand that is there and you would still be looking at very, very strong academic candidates at the bottom end. Part of that is because of this message that has gotten out: both locally it is a good thing to do, it is a noble thing to do, it is a good way to spend your life, it has a reasonable starting salary, it is a secure profession, but on top of that, it is an international profession.

The Hon. ROBYN PARKER: If you take that group out and take out those that are targeted early by the private schools, you are left with a much smaller pool of teachers to distribute amongst our schools in New South Wales, out of that graduate group, are you not?

Professor LOVAT: Particularly when you are looking at the problem that so many then do move out of the profession within a few years after graduation. That is the killer. In actual fact, these days at least, after sort of a blip in the nineties, universities are taking far more people into teaching than they ever have and because the retention rates are quite strong—and that is another myth—compared with most other programs, particularly professional programs, there are actually more people, particularly in the last few years, coming out of universities in Australia. The international people, you lose some, et cetera; these are people who do have bigger choices probably than graduates of the past, so some of them do not ever go to teaching, they go towards the professional end; they become musicians or they work on a cruise ship as a health worker coming out of PE, et cetera, et cetera, et cetera. But the real killer is that the attrition in the profession is outpacing the capacity of the universities to produce the teachers. So the big one is professional development and what is done to support teachers along the way.

CHAIR: You have mentioned in passing the shortages in areas like science, maths and so on. Given the picture you have painted of the competition to get into teacher places and the fact that universities are knocking people back, what is the problem in relation to science, maths and technologies: they are not applying in the first place or dropping out or going elsewhere at a greater rate?

Professor LOVAT: It is clearly a national problem. Certainly at my own place—and, again, the fellow deans that I speak with all say the same thing—to get into something like a Bachelor of Teaching is actually harder than to get into a Bachelor of Science. So society has a problem with science and of course everybody blames everybody else; the physicists will blame the teachers in the schools and the teachers will say well, if the professional scientists would make the whole thing a bit more interesting. It is obviously a huge issue that the whole of society needs to turn its attention to for the sake of the future of the country. Just focusing on the issue of science teacher training or science teachers in schools is just one small component of that. It is not as popular a thing to do to enter, say, science teacher training at my place as it is PE or a range of other areas, but it has improved markedly. Its capacity to draw a reasonable academic candidate out of a school or out of industry has improved markedly.

CHAIR: Has it improved because anyone has been taking steps to improve it, to attract people, or is it one of those cycles that just rolls around without anyone knowing why?

Professor LOVAT: My sense is that the improvement is in accord with the general improvement in the quality of teacher training entrants. Every area has been drawn up by a concerted campaign to make the profession more attractive, to get reasonable starting salaries in place, to upgrade teacher education within universities and to make sure that programs are fortified in respect of the yen to do all the things that the 1998 Senate report told us we needed to do.

CHAIR: And here we are looking at it again. What about this question of getting away, at least to some extent, from UAI scores and whether or not, in terms of the quality of the teachers we

produce, the universities should do more to interview students and to assess their aptitude, their suitability, whatever? What is your view on that?

Professor LOVAT: Mixed, I suppose. I would be the last one to suggest that simply a UAI score was the mark of a future good teacher any more than it is a mark of, necessarily, a future good doctor or lawyer or politician or anybody, it is just one feature of personal development, obviously. There is a lot of research, probably more today than ever, interestingly, that takes us back to almost the beginning of educational research and John Dewey at the start of the 20th century said we should not get too caught up in things like content and method because it is actually the relationship that teachers engage in with their students that is the single most important thing in student achievement and we have just got a raft of new research insights coming out of groups like ACER that the quality teacher, the one who gets the student is the teacher who cares and the teacher who is trusted and all of those sorts of things; it is more important than any instrumentalist sort of knowledge.

So that would tend to lead one to say yes, maybe just going by scores is not sufficient and we should do other sorts of things: we could psychologically test them; we could give them personal values education types of tests; we could do a raft of things. Certainly, you could interview them. But I think the bottom line, again taking a leaf out of the book of the Senate report in 1998, the status of a profession and the status of its training go hand in hand. If you start to fiddle too much with the training side, which is always the risk in a time of shortage in teaching, that someone in the system will just want to get up and be vertical in front of a classroom, the minute you do that not only does teacher training sink in status terms but the whole profession sinks, as it would be if you did the same in medicine.

If you were to say, "I know a really good doctor who is wonderful. He gave injections really poorly and there were a few people who died but people, by and large, felt really good because he was such a great person, he had such a wonderful bedside manner, so maybe we should resile from worrying too much about academic capacity there," it would be disastrous for medicine.

CHAIR: What about how to get more indigenous students into teacher training, to take one example, but a very important one? Clearly, those doing training are not necessarily representative of the population and, other things being equal or maybe even other things not being equal, it would be good if we had more indigenous students. It might also be worth looking at more students from various ethnic backgrounds too. Have you any suggestions as to how that is going? We have heard evidence from other people that suggests that maybe some of the efforts in that area are paying off quite well.

Professor LOVAT: I think again the bottom line is you have got to keep the status of the profession and its training up high. So you do not fiddle too much with that. But on the edges I believe that positive discrimination sorts of means are the most suitable ways of addressing those sorts of issues. Again, the same issue has been addressed in medicine. My own university has produced more medical graduates than any other university in the country and it has done by reserving some of those precious places—about five a year—for indigenous candidates and not lowering standards but obviously negotiating readiness, if you like, and recognising that some groups in the community are going to need some scaffolding before we have equity in professional terms. I think it is a very good model for teaching.

CHAIR: Is your university doing anything like that in the teaching area?

Professor LOVAT: Yes. Medicine has just 60 places so they have to be very protective. We have closer to 1,000 places so we do not need to corral things quite so much. With the strong indigenous education centre at our own place the fact that we have compulsory indigenous Aboriginal education within our teaching degrees, et cetera, means that we have always had a reasonable cohort of Aboriginal students coming through.

CHAIR: And particularly in the light of what you have just been saying about the need to keep the status of the profession high, do you have any comments, negative or positive, about accelerated teacher training programs?

Professor LOVAT: Again, just as we do in all other professions, there are ways in which people can become doctors in an accelerated way; that is, their earlier training is recognised and taken account of—so we do in teaching. There have been a lot of schemes across the country over the last few years that have very successfully brought graduates, and indeed in some cases non-graduates with very demonstrably suitable skills and knowledge for teaching, into the profession in things like two-year programs, et cetera, two-year specialist BEds, et cetera. The response of the profession to that has been very positive. They have not only been seen as being at least as good as those coming through in the regular way but they have often been seen as better, frankly, because they have greater maturity and perhaps greater familiarity with the discipline that is needed in the classroom.

The classic scheme—again, I am sorry to sort of lay Newcastle out before you but it is obviously the one I know best—the scheme that was devised between DET, BHP and the university some years ago when BHP closed down, we brought close to 100 people, most of them non-graduates in fact, probably people who would never have thought of going into teaching but who have wonderful de facto engineering type skills and knowledge and exactly what was needed for design and technology, into the profession. The first time that they went out on prac. half of the principals said, "Don't worry about the training, can I have them now?", sort of thing.

As long as that is the reaction, that is the response, you are doing the accelerated thing without lowering the standards, it is a wonderful thing to do. Again I say that Kentucky is the place that stands out as the bête noire at the moment. In Kentucky, in the face of the extreme shortage that that part of the United States is suffering, you can now be a teacher off the street, non-graduate, in 10 weeks. You might as well take the profession and shoot it in the head.

CHAIR: Do people who go into the accelerated teacher training programs sometimes have more problems adjusting to the culture of schools, not the academic discipline but the discipline of students and their behaviour? Is that a problem for them and some of the older entrants into the standard pre-service training courses?

Professor LOVAT: It certainly has not been my experience and I do not believe it has been our experience. For one thing, more often than not you will find that sort of graduate is a parent. I can think of at least one who is a grandparent. They know kids pretty well. They are confident. Most of them are beyond the hang-up stage and the confusion that you might find in any young graduate who has not quite worked out whether he is supposed to be a model, a mentor or a pal. Our experience with those sorts of graduates has been extremely good, but a few years ago in New South Wales we had to draw the line on one of the schemes that was being put forward by the employing system for getting teachers into a hard-to-staff area quickly. At the end of the day it was only because the unions put down their foot and said that they would not be able to join the union—they would be black-banned—that that particular scheme was stopped. We always have to be on the lookout for quick fixes.

The Hon. ROBYN PARKER: I have heard all of your comments on recruitment and training, and your earlier comments on retention once our graduates are out there and the need for development. What sorts of mentoring programs do you think are effective? How could they be improved if that is a big issue, and we are led to believe that it is?

Professor LOVAT: The whole professional development side of things?

The Hon. ROBYN PARKER: Professional development in terms of retention of graduates once they are teaching over a short period of time?

Professor LOVAT: Teacher training is an interesting one. I think it is the only profession where there is some assumption that it all can be done in that first period of time. Your equivalent numbers in the Victorian lower House who did their recent report—a very good report in terms of what they did and every stone they turned, et cetera—came up with a most unfortunate phrase in the executive summary of "teacher ready". What we want is teacher ready. As long as it is informed that is okay, but it has a tendency to mean the opposite of what 25 years of reports have said we need, which is, like other professions and training, the grounding and the foundations of understanding of the profession; the knowledge that a person will need for the length of the profession, again, as with medicine. The medical graduate is not doctor ready, and you have only to ask an experienced nurse who deals with them. The first day in a hospital they would not let them apply a band aid. It is

understood that the profession will take that foundational knowledge and develop practitioner readiness over a period of time. Eventually the doctor will be let loose on people in a surgery.

The same with a lawyer, to say that a first-year out a lawyer is lawyer ready and is going to take on one of the cases down the road is nonsense. It is understood in all the professions it seems to me—accounting and engineering—but in teaching the first-day-out graduate is expected to run that class and to do everything that the person next door who has been in the profession for 20 years is doing. That is the issue we have to address. It is not an easy one, but it is a whole profession and, to some extent, a whole community thing. The community understands the difference between the first-day-out doctor and lawyer and does not expect the same as they do from the experienced person. Somehow that penny has to drop and then we start to put in place a whole lot of practitioner readiness training, if you like.

The Hon. ROBYN PARKER: Say I have just graduated from Newcastle University and I have been placed in a school in Woodbury. In an ideal world what sort of mentoring—teacher readiness, if you want to use that phrase—would you regard as optimal so that I do not regard it as a place I want to get out of very quickly because of all of the other issues such as the infrastructure, the environment and everything else?

Professor LOVAT: In an ideal world I think you would be partnered with an experienced teacher, like you were the year before in your internship, and gently let go to do the job yourself over a period of at least that first year.

CHAIR: Would you have a reduced teaching load?

Professor LOVAT: I think part and parcel of that would be a reduced teaching load, yes, as it would be for the teacher who was supervising you as mentor.

The Hon. IAN WEST: In listening to Professor Dalziel's earlier comments, that mentoring exercise could be reciprocal in many areas if it was developed properly by the people running the school or the department. You could learn from each other.

Professor LOVAT: Absolutely, particularly, as he said, around technology. He is absolutely right. At the moment the real challenge in the teaching profession is not with the people at universities or just out, but with teachers who have been out for 20 years who are still frightened to push the button.

The Hon. IAN WEST: It may be a little bit immature to see mentoring as a one-way street?

Professor LOVAT: Sure. Yes, I absolutely agree. I taught in our medical program for a number of years on the ethics side of things and I used to follow the new doctors. It seems to me that is how things work in the medical profession. The professors would ask, "What is professor so-and-so saying about this these days? What have you been reading about this?" It was not, "I know everything and you've got to learn." You have just had five years of solid training. It is a long time since I had it. Yes, you are right.

The Hon. ROBYN PARKER: For the new graduate going out into the school, what causes the early burnout, the early bail-out of teaching and, in time, the profession?

Professor LOVAT: A lot of things we have been talking about. But more subtly—and we are will not know whether we are right on this for little while—in the last four to five years we have put a lot more induction, enculturation types of curriculum into place in teacher education. The first day-out teacher might not know how to construct a class list or know where everything in the school is, but they know what teaching is about. They know what schools are about. They know the ideals. They know the realities. We have been trying to stack people up in that enculturation curriculum over the last few years because that is what we see happening in other professional programs. The graduate lawyer is not somebody who knows every case, tort and statute et cetera, but someone who has been inducted into the whole legal game and spent a lot of time rubbing shoulders with lawyers and sitting in on cases and sitting in courts.

Young doctors have been in surgery and the operating theatre. They do not know how to do it all yet. In the late 1990s the Council of Deans report picked up that people who had been exposed to schools for only short bursts of time and had a curriculum that was totally instrumentalist—here is the content, this is the bag of tricks you need to teach that content—are not acculturated into the realities, particularly some of the harsh realities. A few weeks into their first appointment and they had just gone through trying to start off the year, which is the one thing they were never able to do in practice because schools would not have them at that time of the year, they were nervous wrecks.

CHAIR: We have heard quite a bit of criticism of the practicum of university education from a number of points of view in terms of logistical difficulties, the cost of making it work properly and so on. It is interesting to hear you say that this work has been done on enculturation. If those comments were correct I would have thought that is an area in which the university department system is falling down.

Professor LOVAT: There are a lot of issues, which I will not bore you with because I know you have learned about them really well—national awards, payments, underfunding and all of those issues. A few years ago the big insight for us in the teacher education game was stuff coming thickly out of the United States of America, which showed that not only was practicum in the traditional sense—three weeks, out you go, do a bit of practise teaching then back to go to the academy, then eight or nine months later have another little hit and get your report—ineffective as an inductor into teaching but often it was counterproductive. In other words people got all the wrong ideas, and there are some extreme examples of that. They would be teed up with a fairly slack teacher and they would think, "This is a bit of a breeze. Who said teachers need to prepare their lessons?" We have tried to go about the whole professional experience, as we tend to call it these days, in a much more holistic and comprehensive way.

It is not just about hitting the school and doing a bit of practise teaching, it is about becoming part of the school culture for a period of time. It is a more regular thing. It means maybe once a week at least and for long period throughout the four years of training people are around the school doing all sorts of things, taking part in sports carnivals and sitting in on staff meetings and parent teacher nights. The practise teaching side of it is just one small component. That has taken a lot of flexibility on the part of schools, and, I have to say, on the part of unions because to an extent they have been turning a blind eye to what could have been seen as payable formal observations, formal practicum kinds of arrangements. I believe that has played a big part in a much better professional experience regime over the past few years. It is much more suitable to this far more capable academic candidate that we are getting. We have had to adjust the whole way of teacher education to that.

CHAIR: Has your university—and you might comment on others as well—found it easy or difficult to get our schools to co-operate with that more flexible and, in many ways, more demanding professional experience?

Professor LOVAT: It is always a battle. There is a bit of a mentality in education, again unlike what you find in most other professions, that mentoring for the next generation is a bit of a burden. I am not speaking anti-industrially, but I know a lot of union people who would agree with the sentiment that the payment for teachers for the supervision of prac, which was put in place formally in 1991 under the national award, probably was an unfortunate thing. That is not to say that you should expect that a professional is going to do everything for nothing. Teachers get too much of that. But it was a pity that that particular extra duty was the one that came with some payment. It is like paying for friendship as against just having one.

The Hon. ROBYN PARKER: To what extent does the physical environment that a graduate is sent to affect his or her retention? Earlier we spoke about high-achieving graduates being targeted early into the private school system and about their going overseas. To what extent is the retention of graduates affected when they get into an environment that is completely different from what they expected? They have been learning on whiz bang computers, and when they get out there they find that the computers do not work. They have been prac-teaching at a school where they have all the bells and whistles, and they are sent to a school where there is no airconditioning or something like that. To what extent does that have an effect on teacher retention?

Professor LOVAT: That is a difficult question. One would think it has to have some bearing on it, if people are dumped into a pretty awful situation. Granted everything else we have said about the high expectations on a first-day-out teacher to perform, if it is also in a poor environment, that just exacerbates the problem. Let us face it, once upon a time for many people teaching was a last resort; it was something people fell into because they missed out on other things, or they could not quite think of anything else to do. There are a lot of people still in the system who came through in that sort of way and, frankly, would never do anything else. In many cases they are people you wish would do something else, but they do not.

We are now, by and large, looking at a very different kind of candidate. Just as we have had to adjust teacher education to fit a different sort of person, different aspirations, and different possibilities, so the profession has to adjust as well. We are no longer looking at people locked into a profession. For example, somebody with a Bachelor of Teaching and Bachelor of Arts with Honours might be lured by the Arts faculty to do a PhD, or somebody with a Bachelor of Teaching in Design and Technology might be lured into industry, or somebody with a Bachelor of Teaching in Health PE, with really good marks, a great personality and all the rest of it, might be lured into another area.

Interestingly, in the Newcastle area it is the real estate industry that has gotten onto the teachers. For some reason, the real estate agents who win awards are teachers. I know some of them. They have been picked because they are seen as good communicators, they are flexible, and they can sell a message. It is a tough one, and it is one we really have to get our head around. But certainly a system that does not support, a system where the pay runs out after a few years, a system where you are going to sit around on $55,000 until you are 60, is not going to hold good people.

CHAIR: What role do you see the Institute of Teachers playing, and how do you think it will benefit the profession? You may well have some criticisms about it, or some areas of doubt. What is your perspective on it?

Professor LOVAT: It is a great step forward. When I was President of the New South Wales Teacher Education Council and it was put forward initially, I was very supportive. I think it is just a must. You cannot have a status profession where anyone can hang up the plate and say, "I am a teacher because I can do it", "I am a doctor because I can do it", or, "I am a lawyer because I can do it." The institute is a great step forward in terms of personal registration. It is a good check for an employing system that people are trained properly, with the content, the method, the lack of criminal record, and so on. I think probably only two cautions need to be kept in mind as it develops and as other things happen nationally.

First, it has potential. It did not go quite the way that Gregor Ramsey had proposed as at arm's length from a government and employing system professional body. It is very much seen as an instrumentation of government and an employing system. So it does have potential to be trusted by government and trusted by an employing system, but not trusted by teachers. That will be one of its challenges. I do not think it is seen as something that is owned by the profession in the way that similar bodies in other professions are. Because it is so much an instrument of government and the employing system, the institute will struggle to be the kind of accreditor of teacher education that we need in this country.

If you look at the really effective accreditation systems in the United States and so on, they are all very much at arm's length from government and employing systems. The best shot we have there, I believe, is the National Institute for Quality Teaching and School Leadership [NIQTSL]. I do not see any competition there. I think the various State and Territory institutes and boards should concentrate on employee registration and everything that goes with that, which does include, obviously, a training component, but should not get into the business of higher educational training accreditation per se. A quality higher education is something that needs to be judged separately, and probably by the sort of incorporated body that NIQTSL will be by next year.

CHAIR: As you are probably aware, we spoke to Gregor Ramsey about his earlier work towards an Institute of Teachers in New South Wales, but also about his current role in relation to the national body.

Professor LOVAT: Yes.

CHAIR: You do not see any huge demarcation problems or competition, or problems between the New South Wales body or any other State's body?

Professor LOVAT: No. But NIQTSL will not want to get into who is a fit employee for New South Wales; that is for the institute. But what NIQTSL can do is provide this country with the sort of accredited teacher education that, for instance, we can take abroad and create a free-trade agreement movement between, say, ourselves and the United States, which would be of huge benefit to both countries.

CHAIR: Do you see the national body playing a major role in accrediting internationally trained teachers who come here, or do you see that being more the State bodies' role?

Professor LOVAT: It could be both. I think that under any kind of formal heads of agreement set-up it would be national to national. I have done quite a bit of wandering around Washington talking to people about this, and I know that they will not want to come and talk to every State and Territory. They would want a heads of agreement that fitted under the free-trade agreement umbrella. But then, does New South Wales want this particular teacher coming from Wisconsin? That would be a separate thing. Do they have the content we need, in the areas we need it, and so on?

The Hon. IAN WEST: I assume that under a personal registration system a person's qualifications would diminish with time if they are out of the industry. Upon that person's re-entry into the industry, do you see any difficulties with the registration system being a disincentive?

Professor LOVAT: In some cases, it could be a good thing if that occurs. The idea of somebody coming back into teaching 15 years on, without doing a bit of retraining, is a pretty horrific thought, as it would be in the case of a doctor or a lawyer. I think we need to have those high bars.

(The witness withdrew.)

(The Committee adjourned at 4.55 p.m.)