

# CORRECTED VERSION

## EDUCATION AND TRAINING COMMITTEE

### Inquiry into the approaches to homework in Victorian schools

Melbourne — 29 April 2014

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#### Witnesses

Mr S. Pryor, chief executive officer, and  
Ms T. Jelbart, councillor, Mathematical Association of Victoria.

**The CHAIR** — Thank you very much for your submission. We have some formalities in terms of welcoming you to this public hearing of the Education and Training Committee and its public inquiry into the approaches to homework in Victorian schools. It is important for you to know that your contribution, while you are sitting in this hearing with us, is protected by parliamentary privilege, but that privilege does not continue once you leave this environment. Your evidence is going to be recorded, and the transcript of this hearing will be available in two weeks time. You can make comments on any typographical errors. We are very pleased to have you here today. Thank you very much for the extra material you have brought along — some kits. It is good for us to have that resource. Between the two of you, I invite whoever will lead off to make the opening remarks of your contribution.

**Mr PRYOR** — I should just explain something about the kit, if you like. You were clear that you wanted to talk about mathematics and homework, so those are the latest professional journals that went to schools in Victoria last week, and they will give you an idea of the sort of approach to mathematics education that the mathematical association tends to advocate. As you can see, they are quite colourful and they encourage lots of exploration, investigation and so on. That is the sort of mathematics classroom you will find that the MAV tends to advocate for.

The submission itself makes the point that for us homework is something that probably should be driven by policy at a school level. It is something that should allow equally and frequently for practising, for extending and for consolidating so it is not just one type of particular approach to homework. We tend to think that homework is something that needs to be part and parcel of the whole relationship between school and home — the student, the parents, the teachers. It is part of an approach to the overall education of the student. That is essentially it. We are rather pleased that you are interested in mathematics and want to talk to us further about homework and maths.

**The CHAIR** — Ms Jelbart, would you like to make some opening remarks?

**Ms JELBART** — I completely support everything Simon said. Homework provides a fantastic opportunity for a direct communication about the actual work that students are doing in the classroom to the parents so the parents can really interact with the actual learning that is going on. As we know, the majority of learning happens in the home, so when the parent can actually engage in the homework the child has been set, that reflects — and it should reflect — what is happening in the classroom. It is particularly important that students get that consolidation. That is maybe something that is harder for students to achieve these days — to actually consolidate the knowledge they have learnt at school, to carry that through into the home, to have that extra time for practice and consolidation of their skills and learning and to explore the mathematics in the world around them at home. Schools encourage parents to engage their children in activities like cooking and shopping — all of those sorts of activities.

**The CHAIR** — I am interested to know, from the perspective of your professional body, whether you make a distinction in relation to the necessity of homework through the primary years — how those primary years may or may not be divided up in terms of the stipulation or otherwise of homework — and the transition from the primary years into the secondary experience.

**Mr PRYOR** — We gave you a sample primary school homework policy that does in fact suggest that you might approach homework somewhat differently at prep, at year 6 and in between. To give you an example of the sort of thing we would advocate, this morning a member of our staff was at the swimming pool with her daughter, and she watched another mother and child. The child was buried in a piece of Kumon work, so she was not observing anything around her. The other family member was learning how to swim. The mother was actually doing something else. Jennifer Bowden, our staff member, said, ‘What a missed opportunity — a swimming pool! You could explore maths’. You have got volume, you have got shape — you have got all sorts of things.

She said the point that really needs to be made is that, especially in the early days of primary school, homework is something where, really, the parents ought to be, if at all possible, actively engaged. That means that the policy of that school needs to give clear guidance when it comes to that, because we need to understand that the parent of the day cannot be with their kids all the time. It is one of those truisms that the

parents have to make time to be with their child and make it quality time, because there are other things that they have to do in their lives, but being involved in the child's learning in the home and in the environment around them is something that a school really ought to work with parents to encourage.

**The CHAIR** — I think it is very interesting that you make the point that mathematics is all around you, all day, every day, and there is a learning opportunity around that. I was thinking of somebody even just counting the laps the swimmer might have done — it is pretty basic for a young one as well.

**Ms JELBART** — That is right. The reverse is also true in that students actually need mathematics for their everyday lives. They need the mathematics they learn at the school and in the home to participate in everyday life and to work in jobs, so the whole thing is connected.

**The CHAIR** — Do you have a view on how tutoring plays a role in homework, especially through the senior years of the secondary experience? I am sure there is a ramping up from year 7, but we have been given some pretty extreme examples of the investment in tutoring to support the work that is coming from the school. Do you have views and policies on the role of the tutor?

**Mr PRYOR** — We have tabled a policy there for you; that policy right there. I figured that the word 'tutor' would come up, so I thought you might want to see that, because it is part of the context of the time out of school that a student spends on their learning and that parents invest in their kids' learning. The question most often fielded in the office from parents is on tutoring. It ranges from, 'My son is a genius. How do I extend him?' to 'My daughter hates maths, so I'm going to make her do more at some company somewhere' or 'Which of the online products, some of which offer lifetime deals, should I be buying?'. We field a lot of those questions.

We do not have enough resources to do what we would love to see done, which is some sort of standard for the provision of tutoring and maybe even some sort of regulation so that people can have more faith in what is going on. We feel that because we know that parents really do struggle with it, and some of the stories that we hear of the way that these products are sold and so on are a bit hair-raising.

Beyond that, the advice we give is to the parent. We say to the parent, 'Well, think about the opportunity cost. If you are willing to make that sort of investment, think about the range of other ways that you might be able to support the student. But begin perhaps by identifying what is the issue, rather than just leaping into it and saying, "I want to make my kid the best in the world" or "I want to overcome their hatred of maths". Try to delve deeper and understand it, and perhaps also work with the school'. We give some general advice, and you will get the flavour of that from the policy.

Again we have not taken a position on the various products that are out there that get used as online tutoring and so on. Our feeling is that we should try to, given our resources, give parents advice and help them to make some decisions and at all times encourage them to be working through the school and to go through a process in the school. If it is the teacher that the student has some difficulties with, there are ways of dealing with that in the school. If the student is genuinely struggling with the work, again there are ways through the school that perhaps some of these things can occur. But it has been a quite interesting phenomenon over the last six or seven years, hasn't it, in the way that this stuff has just grown phenomenally?

**The CHAIR** — Yes. We have heard some pretty exotic descriptions and examples. It seems like there is some sort of a feeding frenzy out there in terms of acquiring tutors and tutors being interventionist in the relationship between the student and the school. That is quite interesting.

**Mr PRYOR** — My daughter has worked at one of these. She has just qualified, I am proud to say, as a teacher. For a term a year ago she was employed by a tutoring company to teach the subjects she was preparing to teach — English and history. She only lasted a few weeks because she found that the teaching that this tutor company was doing was just the worst possible practice you could imagine. She was basically giving kids work sheets. The MAV does not like work sheets all that much for mathematics, and it seems pretty pointless for history and English. She felt that the parents were buying a product that was quite inferior to (a) their expectations and (b) what could be delivered at the school.

**The CHAIR** — And a lot of pressure being brought to bear as well.

**Mr PRYOR** — Absolutely.

**The CHAIR** — Because there are outlays, and then there is the relationship that the tutor could develop on that one-to-one basis. We heard that students were being exhausted by doing the homework for the tutor ahead of the homework for the school, so they were running a dual system — sort of like a parallel universe, really. Throughout the evidence that has been offered to us in our inquiry, when people describe homework, mathematics is always the first subject that is mentioned, and then it drops off very quickly. It is mathematics that is top of mind, then people will say some reading and then they might say some of the humanities subjects, but they are very strong in the need to be making a commitment to homework around mathematics in terms of it being probably a sense of priority. Is it something where you have mixed results with teaching practice? Why is mathematics homework so much of a concern to people?

**Ms JELBART** — I think that is part of it. There are many and various teaching practices on offer, and that is possibly one of the things that I see. This is more of a personal view, but I teach in TAFE and university, and I help the lecturers provide programs for their students who have come through 13 years of school and need help with basic mathematics. One of the issues is the overuse of calculators. Some students will say that 100 per cent of their time they use calculators in secondary school. That makes it more difficult for them to engage in the mathematical process, and they tend to lose the skills they might have had in primary school.

Then perhaps that makes it more difficult in their senior secondary years when they are expected, especially if they are doing maths methods, to engage in maths without calculators for some of the time; whereas in the other subject, further maths, they can use their calculators. But then that leaves them without the ability to do the basic maths that they will need for carpentry, nursing, paramedics and all those sorts of professions, and they also need it in their everyday lives. I see that is an issue for hundreds and thousands of students, and I think that is a problem that should be addressed.

**Mr PRYOR** — The homework policy really does need to be a mix of that consolidation, exploration, drill and so on. Mathematics teachers can sometimes have the reputation in schools of being the table thumpers who eat up all of the kids' homework time, and that has to be negotiated. That is one of the reasons why we would say that an overall school policy is something that makes a lot of sense, so that it is not one particular teacher dominating the homework time of a student, and where the student's life is also slotted into all of this.

Technology makes management of homework much more readily possible and more integrated with the overall life of the school and the students. As an example, I am sure you have heard of Edmodo. It is sort of like a teacher-moderated social network platform that allows a class of students to work with their teacher and converse with each other. It allows them to diarise their time, so that they are able to start to learn when they are actually engaging in homework, and make decisions. The traditional thing of starting homework at 4 o'clock and working at it for an hour or so that might have been the sort of practice that was advocated when I was a student is more problematic now because there are so many things for students to do.

In the early days in primary school they need to learn how to manage their time so that they can plan their homework and know when they are to be engaging in homework. They might actually be doing 15 minutes worth of something here or there, and they can recognise it, diarise it and report it through Edmodo or some technology like that. Again, it is why we would be saying that although mathematics homework is really important — it is clearly important to parents and to kids — it really ought to be within the context of an overall school policy.

**Mr BROOKS** — The extension of that is: do you think all schools should have a homework policy? Should it be something every school should have in place?

**Mr PRYOR** — Yes.

**Ms JELBART** — I would just like to add to that, in that it is helpful for parents every term if they actually know what topics the students are studying and what the students will be expected to learn. Some parents are reporting that they can access the homework that has been set for their children so they can see it for themselves, and that has been really helpful for them. But I think at the minimum part of the homework policy is that the parents know in advance each term the topics their children will be studying.

**Mr PRYOR** — And they should also know what the purpose of homework is. Education suffers, as you know, from the fact that we are all experts because we all did 13 years of it, so we all think we know something about it, but we sometimes base our expertise on that paradigm of when we were at school — in my case many, many years ago. Some teachers find it difficult at times because the parent is asking for the worksheet and is expecting the teacher to red ink the worksheet because that is proof that homework is happening. That is partially because perhaps the policy of the school has not made explicit what the purposes of some of the homework activities are, and what the expectations that parents should have of themselves, the kids and their teachers.

**Mr BROOKS** — Part of the evidence we have heard today has been that homework should be seen to be ‘working’ as opposed to be ‘being done’. Can I just follow that question up? In terms of your experience with schools and their homework policies, how would you rate the homework policies of schools that you have seen? Are they good, are they not where you would like to see them, or are they close to the mark generally?

**Mr PRYOR** — That is hard to answer. We have not systematically tried to work out what schools have got what policies. We tend to work with schools that have an interest in mathematics education, and they are keen to improve their practice. We advocate homework policies and so on when we are working with schools as part of our practice, and schools that you will find on our website that are listed as mathematics active schools. Think sun smart, but think it for mathematics. It is a recognition that the whole school community is an active mathematics education place. There are about six schools in Victoria that are maths active, and you will find that they have some really good practices and policies.

**Mrs MILLAR** — With mathematics being such a prominent discipline in terms of homework — every time the subject of homework comes up you know that the first one raised is mathematics — what do you see as the particular barriers to students being able to successfully complete homework within the mathematics discipline? Are there specific barriers that are not faced by other types of subjects?

**Mr PRYOR** — There is one barrier that is relatively specific — that is, that we do not have enough qualified maths teachers, and we have struggled to prepare all primary school teachers to be confident, skilled maths teachers. Many are, but there are still primary schools that find that not all of their teachers are confident enough about their own mathematics to really inspire their kids. There are schools where there are virtually no teachers who are formal maths teachers, where virtually all of the teachers teaching maths 7 to 10 are out of field, as they sometimes call them. That means the teachers must know some maths to be working in those classes. They are experienced teachers, but they do not necessarily have the link that somebody like Trish does between pedagogy and maths so that they can call themselves a professional maths educator.

**Ms JELBART** — That is because of a problem that I know some of the professors in education have been trying to solve since I did my degree many years ago — that is, if I have not done third-year maths then I am not able to do method for mathematics teaching and a diploma of education. The students who have done third year maths are not necessarily always going to be the best teachers; it might be the students who have done first-year maths but then moved on to something else. They would still have enough maths ability to teach up to year 10.

There does not seem to be an allowance for the fact that students who have done one year of maths at university might well be very good teachers of years 7 to 10. Most teachers of mathematics in Victoria have science degrees and science methods and because it is assumed that they have a reasonable maths knowledge or because they have said that they do, they move across. That is a specific problem that I know several professors have been working on for many years.

**The CHAIR** — With the teaching of maths in years 11 and 12, are they equally the science teachers who have moved across? Is that where the maths teachers are residing?

**Ms JELBART** — I would say it was a bit more patchy, but yes, you do have the qualified maths teachers teaching that area — the ones that feel more confident about teaching at 11 and 12 level. But you certainly have a lot of science teachers who are teaching maths in years 11 and 12 and that is something that it seems the universities have been unable to change. But at the other end of the spectrum I know of students who have gone through various universities in Melbourne and they know that their contemporaries do not have enough maths knowledge. There is no actual hurdle task in some universities for the students to actually demonstrate a level of grade 6 maths, for instance. They do not have to actually demonstrate a knowledge of the maths.

**The CHAIR** — So somewhere along the line people have been turning a blind eye to this problem.

**Mr PRYOR** — No.

**The CHAIR** — No? What is it?

**Mr PRYOR** — Your committee has had several inquiries into it. It is one of those chicken and egg things. If you are mathematically adept you can engage in many professions, and why choose teaching which pays less than most of them, as an example? You are in demand. There is a worldwide shortage of the mathematically adept. That is a grand statement but it does tend to be borne out. As our world becomes more data driven and technology empowered, the mathematician is part of the team that makes all of that stuff work. It is the mathematician who is helping find the black box on flight MH370 at the moment. Why not do exciting and interesting work like that and be paid a fortune?

It is very hard to recruit adept people into teacher training, so then the circle keeps on repeating where we struggle to give our kids the best maths education that we feel they could have. If you are a principal of the school you put your best teachers in year 11 and 12, perhaps, teaching specialist maths and maths methods; whereas the dreamer in me says, 'Wouldn't it be wonderful if these exciting, inspiring teachers were working with year 7 kids and just turning them on forever'.

**Mrs MILLAR** — One of the challenges with that has been that those people, as you say, who are mathematically adept can then be attracted at university level into parallel maths disciplines like engineering or into being an economist or an accountant.

**Mr PRYOR** — That is right.

**Mrs MILLAR** — They have needed the maths as a prerequisite to get into these other aligned disciplines but they are seen as having more pure pathways into a vocational future; whereas if you are going to major in mathematics you have to then say, 'What is this leading onto?' If you are not particularly interested in teaching, what is the pathway from there?

**Mr PRYOR** — We will be at the careers expo in May, at Caulfield. It is called the *Age* VCE and Careers Expo. It is an interesting event. I have watched it develop over 10 years. Ten years ago there were lots of stands where people talked to kids in general about careers. Now it has sort of become a bit of a fest where the universities and the colleges try and put their brochure into a kid's hand. It is all about the ATAR score and 'What course does it get me into?', 'Monash is better than Melbourne', 'Melbourne is brighter' et cetera. We work with the Australian Mathematical Sciences Institute and we are one of the few that actually run a stand which is about mathematics and careers. We hand out material. We spend the year cutting out jobs ads from the mainland papers where a mathematical skill is advocated.

The careers that people with a mathematics degree can consider are just phenomenal, but most careers teachers in schools do not really know that. They struggle; they say to their kids, 'The reason you do maths is that you will get a better ATAR, not because it creates a career for you'. From the kids themselves the most common question is, 'What are we doing this for, Miss? When am I ever going to use this in life?'. Quite often, funnily enough, the teacher struggles to answer as well.

Again, we ran a project where we took a group of maths teachers into a set of factories in the northern suburbs — this was about six years ago — and the idea was to get the teachers to see what went on in the factories so they could take that back into their mathematics classroom. The teachers themselves struggled to see the maths in those factories.

**Ms JELBART** — This relates back to the fact that we have got so many teachers out there who have not done a method. They are teaching mathematics and they have not done a method. I think this problem should be solvable for secondary education. Teachers who have done first-year maths, or students who are embarking on the diploma of education or masters of education, if they have done a first-year level maths at university, they then should be allowed to teach up to two years below that level, which is to year 11, and to do a maths method and to go on excursions and be educated, as Simon was talking about, about the value of maths. I think that it is possible to do something. These are not unsolvable problems.

With respect to primary school teachers it is a bit of a more complicated problem. A lot of thought has gone into this. At year 12 every year about 30 000 students sit the further maths exam, and more students will have done general maths in year 11. For those two exams every part of their assessment is allowed to be done with a calculator and with a notebook. That sort of removes the need for all secondary school teachers to teach without a calculator. It is easier to let the children do things with a calculator. They say, ‘Well, they do not need to do work without their calculator in year 12, so therefore we are much better off spending our time getting the students to work with calculators’. Students then turn up at university to do teacher training or nursing. The system is very patchy and schools differ, but a lot of students complain that they have used a calculator from the day they entered year 7 through till the day they finished year 12. Those skills that those primary school teachers are going to be needing to teach their primary school students have just been forgotten through lack of use. It is no fault of theirs, really, because this is the system that has allowed this to happen.

I think one solution to this problem is that if there are some assessment tasks in year 12 without calculators, that would maintain the need for students to be working throughout the secondary system doing most of their work maybe with calculators but at least some without calculators, just to maintain those basic skills. I would say some homework with calculators, some without, just to keep those skills bubbling along, so that when they come out of secondary school they can multiply by 10 or by one or by zero even. They have even forgotten those sorts of things. Even quite bright kids who have done reasonably well in their further maths sort of have to check it on their calculator to see what the answers to those questions are.

**The CHAIR** — It is almost like they are putting aside the artisan quality of mathematics, where there are a lot of tactile experiences associated with it. If you think of what mathematicians look like if they are a character in a movie, they are the ones who are filling up blackboards, aren't they? It is just so exotic and so exciting and so very, very tangible, isn't it? I think a lot of that excitement you are talking about is drained out of it.

**Ms JELBART** — I think that is true, and that relates back to, especially in a secondary school, the fact that most of these teachers have not had the opportunity to be trained in that area.

**Mrs MILLAR** — Do you need a higher mathematical skill level to be able to write the types of questions that you are going to be able to answer without a calculator, bearing in mind that there is so much teaching done with devices, iPads et cetera and they will have access to a calculator on their iPad anyway? Is it more challenging for teachers to write the questions that you can answer without a calculator?

**Ms JELBART** — No. I think what usually happens in maths methods is different in years 11 and 12. They do do exams without calculators, and all those questions are just written in a way that you can simply cancel down and work out quickly. It does not involve reams and reams of long multiplication; there is a little bit of long multiplication and a little bit of long division in maybe one or two questions, but the questions are formulated so that they quickly cancel down and the answers come out very easily, showing the underlying mathematics that is required. Using those skills and estimations skills are absolutely the

most important skills that the students have and the kinds of questions that would build those estimations skills are the kinds of questions that you would ask in a calculator-free assessment task.

**Mrs MILLAR** — Do you need to take the iPad or the calculator away from them to ensure that they do it without a calculator?

**Ms JELBART** — I think that is what they are doing in maths methods. I think that is what you have to do.

**Mrs MILLAR** — That could pose problems in a homework-type environment, where they are at home and they are unsupervised. How do you know that they are doing it without the iPad?

**Ms JELBART** — We do not, and we have to hope that students take some responsibility for their own learning and the fact that they know that they will have to do it in the long run. It would be better than at the moment where for some students in some schools or half the students in half the schools there is no expectation that they do any work without a calculator.

**Mr PRYOR** — You mentioned the tablet. It is a conversation that a number of teachers had recently at the MAV, where they were saying that the tablet has been a wonderful second chance for them. The discussion they were having, firstly, was do you have a class set of tablets or do you give every kid a tablet and they use it throughout their education at home and elsewhere? They said, ‘Every kid should have one’ and were in general agreement that it is an individual device. Then they were saying, ‘The wonderful thing is that the tablet has given us an opportunity to get right what we tended to get wrong when we introduced laptops in our schools, because we introduced the technology and then it caught us unawares. We didn’t know about the technology as a school or as teachers and so we gave no advice to the kids, no advice to the parents on the laptop’. Whereas with the tablet, having had that experience, schools are now able to start with the policy that makes explicit the way the tool is to be used or not used and the cultural environment within which that tool is to be used as an educational device. The tablet has given teachers and schools scope for being clear about the way it should be used for homework or not.

**Mrs MILLAR** — Has the association done any work on measuring the effectiveness of some of the apps that are used in teaching mathematics at the primary school level?

**Mr PRYOR** — Things are happening so quickly that it is too early to be able to, in a sense, measure that. What we are doing is sort of like riding on the tail of a very fast moving cat, but we are trying to catch up and help our members catch up with the rapid rate of development. But there are some really impressive people in universities such as Victoria University and elsewhere who are basically tracking down the various apps that are available, and we see our role as tending to be that of a curator. We are not going to be able to do anything other than say, ‘Our experience or our members tell us that these things work and these don’t’. We run what we call ‘appy hours’, where we basically put champagne in the middle of the room and gather 30 or 40 teachers together with their tablets and get them talking and sharing their stuff. We are actually learning from that ourselves.

**Mrs MILLAR** — Small children do engage fairly well with mathematics in that game-type environment.

**Mr PRYOR** — That is right.

**Ms JELBART** — There are some absolutely fantastic programs, including the Khan Academy, Mathletics and Maths Online. They are excellent additions.

**Mrs MILLAR** — Mad Math; I have been addicted to that.

**Ms JELBART** — Yes, teachers and students are using that.

**Mr BROOKS** — Can I go back to a topic that was raised earlier? Simon, I think you touched on it. It was raised in a serious way, as the Chair mentioned, by previous witnesses around some of the concerns



around the growth of some of the negative aspects of private tutoring. You mentioned that there were some extreme examples. I am wondering if you could outline them for us today. What are some of the extreme negative impacts or examples?

**Mr PRYOR** — Some of the stuff that alarms me are those companies that have sold their wares in supermarket and shopping malls. They say, ‘Hello, Sir or Madam. Have you got a son or a daughter? Let me quickly test your son or daughter. Oh dear, they are struggling with mathematics. I tell you what — we can help. I’ll come around to your place tonight, and we’ll talk through how we can help your son or daughter’. Two hours later the parents have made a commitment to maybe eight years of working with an online computer-based tutor system. It is like the way the Encyclopaedia Britannica was sold, and in my opinion it has the same downside and fine print et cetera.

It is just the selling process that in some way alarms me. It is building on fear, and it is cutting the schools out. It is cutting a whole lot of support mechanisms out. The seller is going straight to the parents to make a sale. Even the kid does not get a look-in. It is the parents’ anxiety that is being pandered to rather than anything else. Our member schools are constantly talking about the way that parents are making decisions away from the school and contrary to the way the school sees that those particular parents could be supporting that particular student. It is divorced from the rest of the education system. Again, that is why we feel there ought to be some sort of oversight and some view of all of this.

Some of this stuff is factory stuff. In some suburbs of Melbourne you will find there are shopfronts running where homework involves a student sitting in a group of 30 kids. It is another class, and students are basically doing worksheets for all of the subjects they are enrolled in at school with this private tutoring company in classes of 30 and getting out of there at 9 o’clock at night. This is years 7, 8 and 9 kids, not just years 11 and 12.

As an example we often say to a parent with a year 12 maths student, ‘Who was the highest-achieving student in your school last year in that subject?’. As a close peer to your son or daughter they may well be the best-placed person to help that kid overcome some of the hurdles. They know the systems, and they know the teachers. There are lots of alternatives to the factory system that seems to be developing in Victoria at the moment.

**The CHAIR** — Is this entirely unregulated?

**Mr PRYOR** — We are not aware of any regulation or of any particular confidence you could have in standards that these organisations are saying they meet. Do not get me wrong. There are some great organisations and honest operators out there, but I do not think you can have much confidence in the industry overall.

**The CHAIR** — Mr Pryor and Ms Jelbart, thank you very much for your contribution this afternoon. It has been riveting, and some of the points you have made are really important. I would like to say parenthetically that my son became a human calculator when he worked at Crown Casino and had to make instant calculations for the payouts, especially when he started on the blackjack table. He then graduated to roulette and was dealing with the high rollers, who were playing with millions. He had to make computations instantaneously all the time. His brain became the human calculator. It was terrific. It helped his career in finance immensely.

**Ms JELBART** — I think that is right. The students are capable of it, and we just need to help them toward that goal.

**The CHAIR** — Yes, exactly. It can be exciting and a bit glamorous too.

**Ms JELBART** — Yes, exactly.

**The CHAIR** — Good afternoon to both of you.

**Mr PRYOR** — Thank you very much.

**Committee adjourned.**