



EDUCATION AND INNOVATION COMMITTEE

Members present:

Mrs RN Menkens MP (Chair)
Mr SA Bennett MP
Mr MA Boothman MP
Mr MR Latter MP
Mrs DC Scott MP
Mr NA Symes MP

Staff present:

Ms B Watson (Research Director)
Ms D Cooper (Principal Research Officer)

PUBLIC BRIEFING—INQUIRY INTO THE ASSESSMENT METHODS USED IN SENIOR MATHEMATICS, CHEMISTRY AND PHYSICS IN QUEENSLAND SCHOOLS

TRANSCRIPT OF PROCEEDINGS

THURSDAY, 7 MARCH 2013

Brisbane

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Committee met at 12.48 pm

CHAIR: On 14 February 2013 the Queensland parliament directed its Education and Innovation Committee to inquire into and report on the assessment methods used in senior mathematics, chemistry and physics in Queensland schools. It directed that, in conducting its inquiry, the committee should consider ensuring assessment processes are supported by teachers, student participation levels in these subjects and whether assessment processes support valid and reliable judgements of student outcomes.

Yesterday and today the committee is receiving preliminary briefings to assist it to gain an initial understanding of how assessment processes work in these subjects and what the key issues might be. These briefings are not submissions. They are to give us background information about the scope of the terms of reference. Following the briefings, the committee will determine its approach to this inquiry which will include inviting submissions from the public and consulting with key stakeholders including education and subject matter experts. I would urge all who are interested in this inquiry to refer to and subscribe to the committee's web page for regular updates including information about the consultation process.

Today the Queensland Studies Authority, or QSA, a statutory body of the Queensland government, will brief us about the approach taken in Queensland to assessing the achievement of students in senior maths, chemistry and physics. The QSA is responsible for kindergarten to year 12 syllabus guideline, assessment, reporting, testing, accreditation and certification services for Queensland schools.

I would like to introduce the members of the Education and Innovation Committee. I am Rosemary Menkens, the member for Burdekin and chair of this committee. To my right is Mrs Desley Scott, who is the member for Woodridge and deputy chair of the committee. Next to her is Mr Stephen Bennett, the member for Burnett; Mr Michael Latter, the member for Waterford; and Mr Neil Symes, the member for Lytton. Down the end we have Mr Mark Boothman, the member for Albert. Ms Bernice Watson is the research director.

CARRIGAN, Ms Natalie, Acting Manager, Quality Assurance Unit, Queensland Studies Authority

CLARK, Mr Theo, Acting Manager, Australian Curriculum Branch, Queensland Studies Authority

JORDAN, Mr Peter, Acting Deputy Director, Assessment and Reporting Division, Queensland Studies Authority

ROLPH, Ms Leanne, Acting Assistant Director, P-12 Implementation Branch, Queensland Studies Authority

WALTON, Mrs Patrea, Chief Executive Officer, Queensland Studies Authority

CHAIR: I welcome the representatives of the QSA. This briefing is being recorded and will be transcribed by Hansard for future publication on the committee's web page. It is also being webcast live, and the video will be available on the committee's web page until it is superseded by a subsequent webcast recording.

Parliamentary privilege applies to all committee operations including this briefing. On the other hand, to mislead the parliament including this committee proceeding is a serious offence. If you are unable or unwilling to provide an answer to any question the committee might put to you, you should advise me accordingly giving your reasons. We will certainly consider the reasons and provide ample opportunity for you to seek any advice or assistance that you might need. You might also wish to take questions on notice if you do not have information at hand. You may also request that any material you provide be kept private, and again the committee will consider that request. All of this is detailed in the parliament's standing orders, particularly schedule 8, which relates to public servants, to which I believe you have been directed.

Public Briefing—Inquiry into the Assessment Methods Used in Senior Mathematics, Chemistry and Physics in Queensland Schools

For the benefit of Hansard, I ask that those speaking state their name the first time they speak. We have allocated an hour for today's briefing. Honourable members, I ask that you direct any questions through me as chair after Mrs Walton has concluded her briefing. Mrs Walton, I invite you to take us through your briefing. I ask that you make it about half an hour in order to give members ample opportunity to ask you any questions that they may have.

Mrs Walton: Thank you, Madam Chair. I thank you for the opportunity to appear before the inquiry today. At the outset, let me say that any inquiry or discussion around assessment is welcomed. Because the purpose of today is to provide the committee with an initial briefing, I would like to speak at some length about Queensland's system of assessment. I would also like to take the opportunity to address in detail some of the key matters that were raised yesterday.

The way we assess the learning of young Queenslanders is an important and worthy subject for discussion in the broader community. Assessment is fundamental to the teaching and learning process, as it provides students, parents and teachers with valuable information about individual student achievement. It is also critical in charting students' progress in subjects leading to further education, training and employment. The assessment system we have in place in Queensland today has evolved over 40 years. It is not new and bears no relationship to the system of outcomes based education recently discarded in Western Australia.

For some of you, you may remember in the late sixties, as was raised yesterday, the furore over external exams in year 12, particularly the physics exam in 1967 which was so difficult that about two-thirds of the candidates failed. That prompted a string of inquiries and reports: the Bassett report, Radford report, Scott report—which was ROSBA—and finally in 1992 the Viviani report. The current system has evolved from these reports. Changes to assessment over the years has always been based on the process of inquiry and feedback, external and internal, to the Queensland Studies Authority. There is always room for improvement. Continuing to review and modify the assessment structure is essential to ensure Queensland students are receiving a high-quality education which positions them to compete and succeed in contemporary Australia and internationally.

You would appreciate that I am new to this role. It has just been eight weeks since I was appointed CEO and therefore I have with me experienced colleagues who have a detailed knowledge of the Queensland assessment system. I have to say my first eight weeks has been very fruitful. It has been spent forensically analysing the operations of the QSA, and in recent weeks I have done this in the context of the terms of this inquiry.

Yesterday there were many references to the Queensland Studies Authority, so I thought it important to explain what the Queensland Studies Authority actually is. The QSA is, in effect, a partnership of teachers, principals, public servants and a wide range of education stakeholders including parent, tertiary and industry representatives who, through a variety of committees, perform its legislative functions. These functions include the development of syllabuses and guidelines, assessment and moderation, senior certification and tertiary entrance. They are defined in an act of parliament, the Education (Queensland Studies Authority) Act 2002. The act also prescribes the membership of the authority—a 20-person representative board with members appointed from teacher, parent, union and higher education groups as well as the state Catholic and independent sectors all contributing to a balanced perspective on curriculum and assessment.

Providing advice to this board are the many representative committees that focus on various aspects of the curriculum, assessment, moderation and certification processes. In accordance with this legislation, there is an office of the QSA which is responsible for implementing the decisions of the board. I lead this office. But the activities related to curriculum assessment are not confined to QSA's Melbourne Street premises. The QSA could not discharge its functions without the engagement of the many thousands of teachers in hundreds of schools. After all, at the very heart of the Queensland system is rigorous peer assessment of teachers by teachers.

The system of externally moderated school based assessment involves processes of monitoring and verification which rely on a network of 50 state and 450 district review panels that cover the length and breadth of Queensland. Over 4,000 experienced, registered teachers from Catholic, state and independent schools work as panellists, peer reviewing other teachers' judgements about the achievements of students to ensure they are accurate and comparable.

I now turn to the committee's terms of reference, which mention the concepts of reliability and validity albeit in relation to judgements of student outcomes. Reliability refers to the degree to which a process is consistent and stable, and yields the same outcomes and results on repeated applications. Validity refers to the degree to which the process actually measures what it claims to

measure. So the checks and balances in the system for reliability of teacher judgements involves panels of experienced teachers with subject area expertise reviewing submissions of student work to see whether similar judgements can be made about student outcomes using the syllabus as a reference point. They also check for validity in that what is actually being assessed matches the syllabus and subject matter for the course of study in years 11 and 12. On the grounds of both reliability and validity, review panels provide advice to schools in relation to their judgements of student outcomes.

The foundation of the current system that all assessment is school based has been in place for over four decades and has attracted the favourable attention of academics and educationalists internationally. One reason for such favourable attention is straightforward. The Queensland system facilitates three functions that contribute to a quality assessment program: assessment for learning, assessment as learning and assessment of learning. Assessment for learning occurs when teachers monitor students' progress to inform their teaching. Assessment as learning occurs when students reflect on their own progress to inform their future learning and assessment of learning occurs when teachers use evidence of student learning to make judgements on student achievement against clearly stated standards.

Let me briefly explain how the Queensland system of senior assessment works. The basis of the system is that the assessments for all students are developed by teachers within schools. School based internal assessment is not unique to Queensland; all states and territories use this form of assessment to varying degrees. The difference is that in Queensland and the Australian Capital Territory these systems are 100 per cent school based. In other words, students' final results in their subjects are determined from assessments designed and graded by their teachers and verified by panels of teachers external to that particular school.

There are many checks and balances to ensure the system is valid and reliable. Like other states and territories, the starting point for teachers is syllabuses or syllabi. In Queensland syllabuses are approved—and this is a key point—by the 20-member representative board as required by the legislation and on the recommendation of the curriculum committee of the board. These syllabuses prescribe what is to be taught, how students are to be assessed and the standards against which they will be judged.

Achievement standards are fixed reference points used by all schools to describe how well students have achieved the objectives in the syllabus. Training and resources are provided for teachers on how to use the syllabus. Schools then prepare what is known as a work program, which sets out for the school the assessment they intend to use. For example, in a work program for a chemistry syllabus, the assessment for year 12 students could be made up of five assessment pieces, and that could be four supervised exams and one assignment. This work program is submitted by the principal to QSA for approval by the appropriate panel chair. In this way they agree to oversee and implement the course of study in accordance using the syllabus requirements.

Subject to approval of the work program, teachers then get on with the business of teaching and assessing student work. They assess student work by making judgements about the standards achieved by students for each assessment task. But do not think there is no external scrutiny involved in this process. Teachers' judgements must be based on evidence that will stand up to external scrutiny. It is this quality assurance that supports the reliability of the Queensland system. Teachers' judgements are subject to external moderation by panels of trained teacher reviewers. Panellists get together to review assessment of student work from other schools to ensure it matches the requirements of the syllabus and provide feedback to the school. This is called the moderation process. The aim of moderation is to ensure comparability. In other words, students who are studying physics in Cairns and achieving the same standard for their assessments will be awarded the same level of achievement as those in Corinda. In this way the system ensures that students are treated fairly and standards are comparable across all schools, all sectors and for all students.

Before I move on to discuss how the system works, I need to clear up a myth that Queensland senior assessment does not include supervised exams. Let me assure you exams are conducted in schools every year along the length and breadth of this state. Just ask any student in years 11 and 12.

So how do we know the system works? The moderation process starts with the school's work program being approved by a district or panel chair. Schools then submit student work at the end of year 11 for panels of teachers external to that particular school to monitor standards. Well over 8,000 submissions, each of which contains the work of five students, are reviewed across all Brisbane

authority subjects. Work is again submitted to panels of teachers external to the particular school at a point in year 12 to verify standards and levels of achievement for certification processes—again, over 8,000 submissions across all authority subjects. In addition, and prior to awarding the final levels of achievement to year 12 students across the state, state panellists perform another layer of scrutiny. They check state-wide comparability through the review of over 700 folios of student work checking across levels of achievement. A final check is carried out by officers of the QSA to ensure that schools have acted on moderation advice.

After year 12 students have graduated, an additional check on the health of the system is carried out when a random sample of student work is reviewed. Over 2,500 individual folios from over 200 schools are sent to panels of teachers in different districts across Queensland to review the final levels of achievement—as I mentioned earlier, rigorous peer review of teachers' judgements by teachers. Fifteen years of data shows that teachers consistently achieve a high rate of agreement in the assignment of levels of achievement. The system is consistent within itself and across time. An independent review conducted in 2011 by US assessment expert Dr Scott Marion and two senior experts from the Victorian and South Australian qualifications authorities found that Queensland's current procedures for ensuring both the within year and year-to-year comparability were strong overall. This is not surprising because Queensland teachers have all that they need to make valid and reliable judgements: syllabuses to provide them with the knowledge about what they should teach, standards to use in assessing student achievements and a moderation system to provide opportunities for professional discussions with other teachers about the standards evident in their students' work.

What are the benefits in assessing students this way? There are three benefits. Firstly, students benefit from the frequent and detailed feedback on their work and their higher order thinking skills are developed. Of course, they are not subject to one-off high-stakes examinations that determine their final grades and immediate prospects for tertiary study. Secondly, the system builds the professionalism of our teachers by encouraging their ownership in the assessment process and making them accountable for their judgements. Thirdly, government benefits from a system that is fair, reliable and highly cost-effective.

How do we know schools support the system? Teachers show their support for the system through their very representation on review panels. As I said earlier, there is currently a network of over 4,000 panellists performing this role. There are also healthy attendance figures at assessment workshops where syllabus requirements are discussed and resources provided to assist teachers in developing effective assessment tasks, and feedback received about the quality of these workshops is positive. Satisfaction with the syllabuses is consistently over 80 per cent in the annual survey of schools, even in the year following the introduction of the new physics and chemistry syllabuses.

Clearly, there are some people who would prefer an alternative to a system based solely on externally moderated school based assessment, but I suspect this is no different in other states and territories no matter what system is used, and differences of opinion are healthy. It encourages us to continually reflect on how we are doing assessment and examine its suitability and effectiveness for Queensland students.

Now I will turn to the issues that have been raised. I understand that the motivation for establishing this inquiry is the criticisms that have been made about the syllabuses for mathematics, physics and chemistry, which include the assessment requirements for these subjects. These criticisms I believe fall into the following categories: the quality of the syllabuses; how student achievement is graded and why; the use of assignments in mathematics, chemistry and physics; student participation in these subjects; and how QSA listens and responds to criticism. I would like to provide the committee with some context in relation to each of these broad issues. Let me address the syllabuses first.

QSA syllabuses are not developed in isolation. Consultation is critical to the development of new syllabuses. Teachers, school administrators and discipline area academics from universities actively participate in the advisory committees, writing teams and focus groups. Before a syllabus is finalised, teachers and educators are welcome to provide feedback on draft versions of new syllabuses which are posted on the QSA website and promoted amongst our stakeholders. Ultimately, the board approves a syllabus after it has considered advice from its variety of representative committees.

Queensland syllabuses are not based on the latest fads in education. When a syllabus is developed or revised, writing teams scan what is in place in other states and territories and internationally, examine what the universities are teaching and draw on national and international

research. The goal is to develop syllabuses that set out no more than what is essential in clear and plain language, emphasising standards and requirements. These syllabuses allow teachers to exercise their professional judgement to shape and modify what they teach, their approaches to teaching and school assessments.

I would also like to draw the committee's attention to the fact that there is a high degree of similarity between the Queensland curriculum for physics, chemistry and mathematics B and C and the recently endorsed Australian curriculum for these subjects. I would also like the committee members to note that the Australian curriculum sets out standards that are similar to those in Queensland syllabuses.

How is student achievement graded and why? Let me be clear: QSA has not banned the use of marks. QSA has not banned the use of marks. In 2010 this was further emphasised in the QSA policy on using standards to make judgements about student achievement. This is on our website. Teachers are required to record their judgements about student achievement and this could be done by using numbers, letters or symbols for that matter. However, these marks can only ever be a guide to how well the standards have been demonstrated in students' work. The crucial activity for teachers is to go beyond these symbols and clearly show how students' work matches the standards in the syllabus. This is the true indicator of achievement. It may appear to be common sense that a student got 85 questions right and 15 wrong on a test, therefore their overall achievement is 85 per cent and they appear to have achieved highly. But what does this number mean? What was the test actually assessing? What standard was expected of the student?

With an Ashes tour fast approaching, let us use an example from sport to explain what I mean. I hope you are cricket fans. Do we really think the Australian cricket selectors would make the decision to contract a player on the basis of an extraordinary batting average of 85? Even though they know the method for calculating the average is the same for all players, would they want to know more—not just more numbers but more meaningful information such as a summary of achievement that suggests ability and future prospects? Were the player's runs scored against low-quality opposition or at a lesser grade? He may struggle in the international arena. Were his high scores made in certain pitch or weather conditions? He may not reproduce this average in different conditions. Does the batsman have any technical deficiencies in his game? He may be weak against swing bowling or spin. Is he good in the field? His average will be seen in a different perspective if his poor fielding costs the team many runs or even the game. The selectors are interested in a profile of information and in the end they want a meaningful summation of a player's achievements. This can only be done well with the existence of essential criteria and standards of performance against which the individual performance can be judged.

How is this different for a student who achieved 85 out of 100 in a supervised examination? This principle applies widely, well beyond sport and education. A mark tells only part of the story. More information is needed to assess achievement. Is it too much to ask teachers to do the same thing when they are making high-stakes decisions about young Queenslanders? When I was a principal I expected my staff to be proficient in making judgements using standards. I know that my colleagues in schools have this same expectation.

Let me talk about the use of assignments in mathematics, chemistry and physics. It has been suggested that extended experimental investigations—EElS, and if you are happy I will continue to use that acronym—and extended response tasks—ERTs—are not appropriate in physics and chemistry and that students are writing up to 10,000 words for individual assessments. I will address this issue of word length a little bit later.

An extended experimental investigation is an example of inquiry based learning in which a student undertakes an experiment, conducts some scientific research and writes a report. For example, it might be around using model cars to investigate factors affecting speed. An ERT is similar; however, the research focuses on the work of others in an ERT. At least one EEI must be completed in year 12 in both physics and chemistry. Extended response tasks are optional. The EEI need not dominate the assessment program; it is just one of a number of assessments to be completed by a student, each assessing different objectives or combinations of objectives in the syllabus. By setting an appropriate range of assessments a teacher can ensure they have enough information to make judgements about a student's achievement and arrive at a final grade.

In my view, the EEI issue should be addressed in two parts—first, the concept of inquiry based learning and, second, the way they are used in schools. Does the QSA consider that the concept of inquiry is appropriate for assessing students? Clearly we do. Does the Australian curriculum include a focus on inquiry? Yes, it does. One of its three strands is science inquiry skills.

Is this just the view of 154 Melbourne Street? No. Leading academics support the concept of inquiry. I will not detail the research evidence here, but it can be provided upon request. But it is clear that EEs are a valuable assessment technique for year 12 students because they develop students' interest in science—their passion for science—and understanding how science works. They also improve problem-solving, critical-thinking and reasoning skills.

Queensland is not alone. Other states and territories include a form of inquiry, such as open ended investigation, in their range of assessments for mathematics and science students. The highly regarded mathematician, computer scientist and educator Seymour Papert assures us that skills our children will learn in the classroom will be obsolete by the time they enter the workforce. The one exception is the skill of being able to learn. This is what gives people their competitive edge. With Papert's observation in mind, we can better appreciate the value of learning through inquiry based activities as opposed to the learning-by-rote approach.

This brings me to the second part of the EEI issue; that is, how much they have been used in schools. I am led to believe that there have been some unhelpful practices associated with the use of EEs, ERTs and other assignments. That is why modifications have been made since 2007—in response to teacher feedback. But despite the best efforts, there still appear to be instances where students exceed the word length. It is not the role of panels to enforce word lengths. They are primarily concerned with the way in which a student's work meets the standards in the syllabus. Schools consciously make this decision, not the Queensland Studies Authority. The length of EEs and the scheduling of assessments during the school year are managed at the school level. But it is the Queensland syllabuses that prescribe the use of EEs and it will therefore be panellists, panel chairs and staff at QSA who will continue to work with schools on their implementation.

The intent of the syllabus was to introduce an assessment technique that sparked students' interest in science and improved their problem-solving, critical-thinking and reasoning skills. In many cases, schools are working well with EEs, and this was made clear yesterday by the acting director-general of the Department of Education, Training and Employment when she stated—

Education Queensland supports the suite of assessment tasks outlined in the current QSA senior mathematics and science syllabuses as students are able to demonstrate what they know, understand and can do across the course of study through rigorous, authentic assessments.

But in cases where schools are reporting difficulties, support is provided to get them back to the intent of the syllabus.

Let us talk about student participation in mathematics, chemistry and physics. It has been suggested that the use of EEs and assignments are contributing to a decline in students enrolling in maths and science subjects in years 11 and 12. There is not a decline. I am pleased to say: the data shows that since the introduction of the current syllabuses, EEs included, the historical decline in enrolments has been arrested in mathematics B and C, physics, chemistry and biology. In fact, in almost all cases enrolments are going up. It is also worth noting that the upward trend of the past four to five years is more noticeable for boys, the cohort allegedly most disadvantaged by the current assessment requirements. I have tabled an information pack for committee members which includes enrolment and completion data around these subjects.

There are important points to note about the graphs I have provided. The data set is about students who have completed four semesters of study in these subjects. The numbers are also expressed as a percentage of what is essentially the 17-year-old population. That is a nationally agreed population figure used when national tertiary entrance ranks are calculated, called the age weighted cohort.

CHAIR: One moment, Mrs Walton. Could I just have an agreement from the committee that we are happy to table this information? Yes, leave is granted. Thank you.

Mrs Walton: Any robust analysis must do this, because we all know that the number of students staying on to year 12 has been steadily increasing in recent years. Yesterday we heard that mathematics C has almost completely disappeared. However, the evidence shows that in 2012 there were more mathematics C students than in any year since its inception. We owe it to our students to make sure that we base our decisions on verifiable evidence, not anecdotes. This matter is far too important. We also know from performance data that the numbers of students who are dropping out of maths and science subjects are the ones who are achieving at the lowest level. In other words, our best and brightest maths and science students are continuing to study mathematics, physics and chemistry to year 12.

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Can I talk about how QSA listens to criticism and responds. QSA welcomes criticism. When I was a principal in a school I was told by a university marketing expert to treat every complaint as a gift. That was very sound advice to improve processes and matters which caused the complaint to occur in the first place. It is no different at QSA. I recognise that no system can remain successful if it fails to respond to the concerns of teachers, principals and others. All good systems of assessment need to be checked regularly. Their evolution depends on constructive criticism and external review.

The criticisms of maths and science teachers have not gone unheard. Over the years the feedback of teachers since the current syllabuses were first trialled in the early 2000s has been paramount to improving quality. Staff have convened special meetings of concerned teachers and responded by improving policies on assessment requirements and making judgements about student work, reducing word-length requirements for chemistry and physics assignments, developing additional resources and support materials, providing advice and clarification for teachers and panel members, and providing additional training for panellists and additional workshops for teachers.

QSA has also engaged with the university sector. Last month a forum of university academics and other education stakeholders was convened to discuss the interface between secondary and tertiary mathematics education. I do not have time to reflect today on the forum in any detail, but what I can say is that academics, including the head of the mathematics department at the University of Queensland, Professor Joe Grotowski, consider the content of Queensland's mathematics B and mathematics C syllabuses to be good preparation for university.

Before I finish I would like to mention some recent research completed but as yet unpublished by Professor Peter Fensham and Dr Alberto Bellocchi of QUT. They have compared how the assessment systems in four Australian states encourage or discourage deeper levels of learning or higher order thinking in students studying chemistry. They are referring to assessments that encourage students to combine facts and ideas and synthesise, generalise, explain, hypothesise or arrive at some conclusion or interpretation—the transformation of information and ideas. They conclude that Queensland leads this group, attributing this fact to the system of assessment here. The existence of mandated criteria and standards means that Queensland teachers need to design assessment instruments that allow students to demonstrate the higher levels of response.

While all state and territory chemistry syllabuses examined by the researchers had the one goal of promoting higher order thinking, Queensland was the only one to achieve an appropriate focus in its exams. Marks based systems tended to emphasise lower order thinking, while examinations based on criteria in syllabuses tended to award greater credit for higher order thinking questions. Furthermore, by limiting the focus of examinations in the assessment program Queensland students have greater opportunity to engage in assessment tasks such as EEs that encourage higher order thinking and hands-on science and have these tasks contribute equally to their overall grades. I would encourage the committee to contact Professor Fensham and Dr Bellocchi to confirm their findings.

In conclusion, I would like to emphasise to the committee that Queensland syllabuses are developed with the education community over several years. Marks are not banned. Queensland is not the only state to use a form of inquiry in assessment. Based on QSA data tabled today, participation in maths and science is not in steep decline amongst boys or girls. Finally, QSA has a 20-member board representative of educational stakeholders; principals; Catholic, state and independent sectors; parents; and university academics who bring to the board table views from their respective bodies. QSA engages with teachers and academics, modifies syllabuses and provides additional resources to support implementation. QSA's very governance is one of consultation.

The Queensland system of assessment is based on syllabuses and assessment practice that must work for thousands of students and hundreds of teachers in schools. It therefore has to stand the test of these many judges in many contexts. Not everyone will support the system, but overall it succeeds in its task. The system is not broken. Its principles are sound, its processes are dependable, its workforce is capable and its outcomes are fair and accurate. The comments from the school sectors at yesterday's briefing leave you in no doubt that the system is not broken but, like everything, it needs to be nurtured and improved if it is to continue to do what it is designed to do. Senior assessment is high stakes for young Queenslanders, and change must always be framed in the best interests of Queensland students. Any improvements must be supported by student evidence.

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I trust this initial briefing has assisted the committee and I look forward to providing further information should it be requested. After a drink of water, I am happy to take questions.

CHAIR: Mrs Walton, thank you very, very much for that very, very comprehensive overview. I certainly will be inviting questions from members. I might just put the first question. Much of the concerns that have been put to us have been between the standards based approach to assessment and the numerical scoring system but, in amongst that, that much of these decisions are subjective. That does seem to be the base of much of the concerns that have been brought to us, particularly with the standards based approach. Could you comment that, please?

Mrs Walton: Thank you for the question. I note that marks have been an interesting topic of conversation around assessment—and can I also declare to the committee that back in the 1990s when I taught accounting I, too, used marks—but the issue is not marks; it is about whether you take the syllabus which has objectives, the assessment assesses those objectives and then student achievement is judged against the standards in the syllabus. But for perhaps a more detailed explanation I might hand over to my colleague Peter, who has had a long history with the Queensland Studies Authority.

Mr Jordan: Thank you, Patrea. The system that has evolved actually was developed from a system where we did use marks exclusively. We used marks exclusively during the seventies. It was called the Radford system. It was a system that was based on comparing students' performances against each other. That is sometimes in the academic literature called norm based assessment. One of the problems with the system was that when teachers gathered in moderation meetings—and in those days a teacher from each school gathered at a centre and discussed students' achievements—they would compare their percentages or compare their marks. What was missing was a standard. So the 85 per cent was compared with an 87 per cent but it was not pegged to a standard. In the late seventies another review was conducted and that was the Scott review, the review of school based assessment, which prescribed or advised that a better system would be one that was based on standards where teachers were able to make their judgments based on a body of evidence, based on the student work, but linked back to the standard. You can use marks to get there, you can use symbols, some teachers will make an overall judgement, an on-balance judgement, to get there, but at the heart of it lie the standards that are enunciated in the syllabuses.

CHAIR: Questions from the panel?

Mrs SCOTT: As you know, Woodridge is a very, very multicultural area. If you go to Woodridge High you will find several hundred students in intensive learning support learning their English language and so on. Many, many of these students have a great thirst for learning and they actually achieve very highly given a number of years, whether or not their written tasks are up to the highest of standards. We often see researchers from Asian countries and India. It is very multicultural in that field, I find. I am just wondering about that issue of having, in maths, chemistry, physics and so on, written tasks and whether or not teachers actually modify when they are marking and say, 'Well, this student in their practical stuff is highly rated, but actually their English language might be a little lacking.' What is the answer there?

Mrs Walton: I am happy to answer that question, thank you. Woodridge State High School was where I did my first practical teaching so I have an association with Woodridge State High School.

Mrs SCOTT: You would love it now.

Mrs Walton: Going back only a few years, let me say. I am very pleased you raised the issue because this is not just related to that area. There are a lot of schools across Queensland—in state, Catholic and independent schools—where we do have and welcome a very broad multicultural population. In developing work programs for the syllabus the school provides opportunities for students to demonstrate what they know and what they can do. Teachers ensure—our teachers, our highly trained and qualified teachers—that the particular needs of groups are met, such as female students, male students, Aboriginal students, Torres Strait Islander students, students from non-English-speaking backgrounds, students with disabilities, students with gifts and talents as well as geographically isolated students and students from low socioeconomic backgrounds. The subject matter chosen, whenever possible, should reflect the contributions and experiences for all groups of students at that school. Learning context, community needs and aspirations are considered by teachers when selecting the contents of the work program.

Some examples of assessment in which schools tailor the assessment to the learning needs or the context of that school are, say, in the Torres Strait, chemistry students might investigate the processes for filtering seawater to drinking water; in Mount Isa, physics students may investigate the efficiency of solar ovens—maybe not at the moment—or solar hot-water heaters; and for a school in Logan, chemistry students might investigate water quality in the Logan River. That is the absolute beauty of school based assessment: that teachers at Woodridge High or whatever school tailor the learning experiences that are relevant and appropriate to the students in that school.

Mr BOOTHMAN: Yesterday when Professor Peter Ridd gave his address, one point on which I certainly do agree with him is the marking system itself—the A, B, C, D, E et cetera. Can you explain the actual marking guidelines? How can somebody actually add up those results, because I find it extremely confusing myself? On Tuesday night I was reading through the documentation about it and I could not make head nor tail of it. If you can explain it that would be greatly appreciated.

Mrs Walton: Absolutely. I thank you for the question. It is a good question to ask. Given that I have not marked accounting since the early nineties, I will hand over to my colleague Natalie, who will provide a more detailed response.

Ms Carrigan: It certainly is a technical field and I will do my best to explain it in a straightforward way. Standards are not awarded for every question, or syllabuses do not require teachers to award a standard for every question on a test. Rather, the teacher's role is to award a standard—not the standard in their head but the standard according to the syllabus—for each dimension assessed in an assessment instrument. For example, in a maths test, which might include 10 questions that assess knowledge and procedures—so there are 10 questions that assess knowledge and procedures on the test—the teacher's job is to award a standard based on that collection of responses. So they might mark all of the questions and then consider the collection of answers as a whole against the standards described in the syllabus. The syllabus provides five choices for the teacher: an A, B, C, D or E. They are not arbitrary letters. Those letters represent qualities of learning, qualities of mathematics evident in the student response. So the teacher's job is not to award a standard for every question but merely a standard for the overall response for that dimension.

Mrs Walton: The analogy, if I may, that I find best describes this is a pilot flying a plane. Now, I think a pilot has to do three things. They have to know how to take off, they have to know how to fly the plane and they have to know how to land the plane. They are the three objectives to get your pilot's licence. They are the three objectives that we are talking about here. The trainee pilot gets six out of 10. They did okay on take-off, they did okay on flying, but they failed miserably the landing. Get my point? So you can take numbers, you can do any of that, but the objectives of learning how to fly a plane—take off, fly and land—are just like the objectives in, say, the chemistry syllabus, where there are three objectives. Do we think by the end of year 12 that we should just take an overall, like the six out of 10 for the pilot, when they absolutely haven't addressed a key element of the syllabus? No, we wouldn't.

CHAIR: I think perhaps the hardest part about this is that parents, and very intelligent parents, have a lot of concerns about it. I say that quite across-the-board. Whether it has not been explained correctly to them, whether their concerns are genuine—I guess from our perspective that is where we are coming from. I guess Mark's question there echoes a lot of the queries that we as the committee are going through ourselves at the moment.

Mrs Walton: Can I respond to that? The 20-member representative board of the Queensland Studies Authority actually has two parent representatives on that board. Those two parent representatives are involved in the decision making around board decisions. I am a parent, too, and there are times in matters to do with school I have found a little bit interesting from time to time. We are talking high-stakes assessment and it is not simplistic, I have to say. Mind you, systems in other states are not simplistic, either. However, I can assure you that in communicating with parents and students the QSA has a number of avenues through which it communicates to students and parents. Typically, however, that is done through the school.

The school—usually the principal or a deputy principal or a head of learning—provides advice to parents and actually explains how the system works, how they mark, how they come to the standard of achievement, level of achievement, how they match the student work against the standards. Certainly schools need to be able to undertake a forensic examination of how they do that and be able to explain that to parents. The best way that I have ever done that when explaining it to parents is having the student work there and exemplars of work to show the parent the

difference between this body of work and this body of work. Schools do that every day. Students are well aware of that, but certainly the matter of communication is critical. With students we have avenues where we communicate directly to students and we certainly have representatives on our board. Most of the communication though to parents would be done through the school itself.

CHAIR: Absolutely. We do appreciate that, because the QSA has its tasks in front of it as well. We would be very interested in having some exemplars of EEIs and ERTs—naturally without names and so forth—to actually look at from the committee's perspective because it is a very complex issue. I do appreciate the effort you have gone to to explain it to us. Do we have some further questions?

Mr LATTER: In a previous hearing certain assertions have been made, particularly with regard to assessments being appropriate to courses offered through tertiary education. I note your previous comments and thank you with regard to demonstrating stakeholder engagement with tertiary educators or universities in that space, but can you indicate the level of engagement in that space in response to assertions that assessments are not necessarily relevant to courses on offer in university?

Mrs Walton: I can talk about the mathematics. The authority has learning area reference groups which are around courses of work—for example the mathematics learning area reference group—and on those groups are academics. On the mathematics learning area reference group we have Dr Joe Grotowski, the head of the mathematics faculty at the University of Queensland. I had asked this deliberate question of that particular academic around the maths B and maths C syllabus in light of comments that have been made: are these appropriate syllabuses for students in their preparation for university? As I said in my presentation, he clearly said they are appropriate for tertiary study.

There is lots of discussion from students and teachers around EEIs and how they place them well for university. Lots of that information is anecdotal. I can say that the anecdotal evidence that I have before me—and that is why I have brought Theo along. Of all of us, he is the one who has been most recently in the classroom teaching these new syllabuses—teaching the physics syllabus with the EEIs. Students in his class say to him about the EEIs that when they finish school and when they go on to university—look not everybody is a fan, but not everybody is a fan of exams, either. Think back to your own schooling. Did you love every piece of assessment you had to undertake? If you did I think you are extraordinary because I do not think I did. However, there are some things that you perhaps preferred, and it is no different with EEIs. Some students love them. I was talking to a principal of a non-government school just recently who told me about his own son who loved doing the EEI. I am sure that is not the case with all students.

Mr LATTER: Further on from that, in terms of the general preparedness of students going from secondary education into tertiary education, is there quantifiable data available that would support that students are at an adequate level when they are entering university, that when they are taking on a higher level of physics or maths or whatever it may be they are making the grade?

Mrs Walton: Yes, that is a good question. I will make some comments and then hand over to a colleague who may have some more detail around that. When we are talking about whether students are ready for tertiary courses of study, we need to just take into account a couple of things, and I am sure any academic would agree. Universities determine the OP level for the course in which students will enrol. So some universities have very high entry cut-offs, as you would be aware, for a course of study. For that same course of study in another university the OP entry could be 16, let us say, for physics. I will be honest with you: with an OP of 16 entering into a physics degree the student may well struggle. I think that is an issue.

The other issue around tertiary entrance is around prerequisites that universities have. Certainly universities can make a decision around the prerequisite subjects that they would like to have for students going into those courses, and they certainly do. Maths B is a prerequisite for a number of courses. That would also indicate why a number of students would do maths B, because it is prerequisite. You would know that when students are selecting their subjects at the end of year 10 they often take that into account. They may not know exactly what degree they want to do when they go to university, but they hedge their bets and look at doing a broad course of study. For a more specific answer, Peter, can you add to that?

Mr Jordan: There are some other factors, too. Patrea mentioned in her presentation that we recently had a forum of maths and science academics from universities all over Queensland. Specifically, we were looking at the preparedness of secondary school students doing science and technology related courses that depended on maths. Patrea has mentioned two of the factors.

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Another factor that I think we need to consider and be aware of—and it is not going to get any better—is the vast range of students who are able to enter universities nowadays compared to 20, 30 or 40 years ago. This is only going to become exacerbated with the Bradley targets for universities on completion of tertiary qualifications.

The forum consensus a few weeks ago was quite surprising to us. While it is acknowledged that some students coming from secondary into university have difficulties with problem solving and transferring core knowledge into higher mathematical skills, none of the academics—and there were 35 or 40 people in the room—laid blame on the curriculum content of the senior mathematics syllabuses. It would appear that the curriculum content and the standard required is there but, with a larger range of students entering first-year university, to me it is no surprise that a student who has a sound for maths B might struggle with the high demand of first-year university mathematics courses. University is supposed to be harder than secondary school.

CHAIR: Thank you very much, Mr Jordan and Mrs Walton. We have gone over the allotted time. Your comprehensive overview has certainly whetted the appetite of our members. I know there are a lot more questions. Would you be willing to answer further questions if the committee sends those to you?

Mrs Walton: Absolutely. It is a great discussion to have.

CHAIR: As I say, this is an initial briefing to give us the start to look at how we can scope those terms of reference. I really do thank you most sincerely for coming in this morning. I look forward to the committee receiving submissions from you during the course of the inquiry. I am sure that you will encourage others to make submissions as well. We really do appreciate your time. Once again, I urge those with an interest in the work of the Queensland parliament's Education and Innovation Committee to subscribe to the committee's email subscription list via the Queensland parliament website. I now declare this public briefing closed.

Committee adjourned at 1.52 pm