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Queensland Board of Senior Secondary School Studies

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Overview

This is a report of activities completed by the Queensland Board of Senior Secondary School Studies (the Board) as part of issuing 38 727 Student Education Profiles (SEPs) to students who completed Year 12 in Queensland in 2000.

An SEP may contain a Senior Certificate or it may contain both a Senior Certificate and a Tertiary Entrance (TE) Statement. The Senior Certificate is issued by the Board, which is also responsible for statewide rankings derived from school assessments (OPs and FPs). The TE Statement is issued by TEPA, and informs students about these statewide rankings.

- A Senior Certificate is received by all students who complete Year 12
 with at least one result in a Board subject, Board-registered subject, or
 Recorded subject. The Senior Certificate also reports the details of
 accredited vocational education, as well as grades in the Queensland
 Core Skills (QCS) Test.
- A Tertiary Entrance Statement is issued to OP-eligible students. It reports
 overall achievement on a statewide ranking from Overall Position (OP) 1
 (highest) to OP25 (lowest), as well as achievements in a maximum of
 five fields ranked from Field Position (FP) 1 (highest) to FP10 (lowest).

Table 1 presents summary information about Year 12 students in 2000.

Table 1: Summary of the Year 12 student population in 2000

Number of Year 12 students (including visa students)	38 727
Number of Year 12 students (excluding visa students)	38 210
Students eligible for an OP or equivalent OP	28 288
Students eligible for an OP (excluding visa students)	27 836
Students ineligible for an OP or equivalent OP (including visa students)	10 439
Students ineligible for an OP (excluding visa students)	10 374
Repeat students (including visa students)	232
Re-entry students	58
Students who completed senior studies over three years	108
Visa students (eligible and ineligible for an equivalent OP)	517

In the preparation and distribution of SEPs, and during the review period, the Board:

- continued development of the format of the Senior Certificate
- sent schools provisional data about their students
- analysed statewide data to produce parameters needed in the calculation of OPs and FPs
- analysed data from each school looking for possible anomalies
- analysed individual student data to identify possible outliers before the finalisation of OP calculations
- conducted any necessary special-case calculations
- determined OPs and FPs
- produced and dispatched Senior Certificates and Tertiary Entrance Statements

- electronically transmitted tertiary entrance data to all tertiary admissions centres and selected interstate universities
- processed applications for verification (Senior Certificate) and review (Tertiary Entrance Statement).

Although the production of the SEP has become more complex in recent years, the Board continues to meet this challenge with new products, processes, and practices.

1. What developments were there in the format of the Senior Certificate?

In 2000, as in previous years, there was continued development of the format of the Senior Certificate.

The mission of the Board is to make senior studies rewarding for students by working with schools in a changing social context to create and maintain high standards, excellent courses and valuable certificates. The Board is dedicated to, among other things, issuing certificates that are valued and widely accepted as informative, accurate and authentic records of students' achievements.

In 2000, students received Senior Certificates printed on A4 paper with details about vocational education achievements and other Recorded subjects printed on accompanying statements. This differed from the format used to print certificates from 1997 to 1999. From 1997 to 1999 students received certificates printed on A3 paper when their achievements could not be reported on one piece of A4 paper. The main reason for the format change in 2000 was that there was a strong possibility that the achievements to be reported for some students would not fit onto one piece of folded A3 paper.

In 2000, certificates printed with accompanying statements reported vocational education in one or more of the following ways:

- as part of Board subjects or Board-registered subjects with syllabus documents developed by the Board
- as part of Board-registered subjects developed by the school
- as a Recorded subject
- as studies completed under school-based apprenticeship or traineeship arrangements.

Some students received certificates with vocational education achievements reported on two accompanying statements.

In 2000, as in 1999, students who completed studies towards a school-based apprenticeship or traineeship had the opportunity to have these studies reported on their Senior Certificates as being completed under these arrangements.

All certificates in 2000 show summary information, such as:

- levels of achievement in Board and Board-registered subjects
- · QCS Test grades
- vocational education certificates completed
- number and type of Recorded subjects.

The Senior Certificate also includes a statement that the certificate is a credential recognised within the Australian Qualifications Framework.

The explanatory notes included on the back of certificates were revised to reflect curriculum developments. The students who completed accredited vocational education and Recorded subjects received explanatory notes for these on their certificates.

Developments of the format and user-friendliness of the Senior Certificate were necessary in 2000 (as in previous years) because the senior curriculum

continues to develop in response to changes in the senior secondary school population.

The design of the 2000 Senior Certificate accommodates the following situation in 2000:

- 38 727 senior students received a Senior Certificate (in 1999 there were 37 032); 672 external certificates were produced (in 1999 there were 864)
- 19 667 students received a result in one or more of five Board subjects or 43 strands of Board-registered subjects with embedded vocational education (in 1999 there were 15 865 students with results in embedded vocational education, and in 1997 there were 2616 students with results in embedded vocational education undertaken as part of Board subjects)
- 246 505 modules and/or competencies were printed for 18 686 students as part of Board subjects and new SAS Board-registered subjects reported on the Senior Certificate (in 1999 there were 194 299 modules and/or competencies printed for 15 116 students, and in 1997 there were 18 097 modules and/or competencies printed for 2355 students, as part of Board or new SAS Board-registered subjects)
- the highest number of modules reported for a student studying Board subjects or SAS Board-registered subjects with embedded accredited vocational education was 118 for eight such subjects (in 1999 the highest was 88 in six subjects and in 1997 the highest was 32 in two subjects)
- 893 students completed seven or more Recorded subjects, of which there were 987 distinct Recorded subjects reported on the Senior Certificate (in 1999 there were 1758 students with results in seven or more of 1429 distinct Recorded subjects reported, and in 1997 there were 1315 such students and 492 such subjects reported)
- 972 students were recorded as studying under a school-based apprenticeship or traineeship program at 157 schools; of these, 658 students in 127 schools had modules or competencies shown on their Senior Certificate as being completed under these arrangements (in 1999 there were 413 students at 97 schools who studied in such programs, 374 of whom from 85 schools had modules or competencies reported.)
- 20 728 students finished Year 12 with at least one VET result recorded on their Senior Certificate (in 1999 there were 16 299 students with at least one VET result).

These changes to the format and user-friendliness of the Senior Certificate were designed to produce useful minor improvements while preserving the continuity of the Senior Certificate.

2. What data were sent to schools?

The Board mailed data to schools, depending on the category of the school and the category of subject-groups within the school (see tables 2 and 3). The mailings involved sending information about scaling parameters for large and intermediate subject-groups, scaling information for small groups, provisional second stage scaling parameters, provisional QCS Test performance data, special scaling procedures for visa schools, and procedures used for visa subject-groups.

The procedures for calculating OPs and FPs take into account different school sizes as well as differences in the size of school subject-groups. There are also procedures for 'visa schools' and 'visa subject-groups'.

Table 2 provides the different categories of schools involved in the 2000 OP calculations. Table 3 provides the different categories of school subject-groups involved in the 2000 OP calculations.

Table 2: Count of senior schools by category¹

Total number of schools with senior students	
Number of senior schools with OP-eligible students:	
Large schools	294
Small schools	34
Intermediate schools	9
Schools with a high proportion of visa students (visa schools)	4
Schools without any OP-eligible students	10

Table 3: Count of school subject-groups in Board subjects by category

Total number of school subject-groups	8177
Large subject-groups	3957
Small subject-groups	2886
Intermediate subject-groups	1004
Subject-groups with a high proportion of visa students (visa subject-groups)	68
Subject-groups without any OP-eligible students	262

Following receipt of assessment data from schools (Exchange Disk 5) on 23 November, the Board sent data to schools as follows:

- large schools were sent data on 27 November
- large schools were sent a second dataset on 4 December
- intermediate schools were sent data on 4 December
- small schools were sent data on 13 December
- visa schools and schools with visa subject-groups were sent data on 13 December (these schools were earlier sent a letter alerting them to different procedures applied to the calculation of scaling parameters for subject achievement indicators (SAIs) and overall achievement indicators (OAIs)²).

There were 17 requests from schools for electronic copies of data on group QCS Test performances.

A further report will be sent to schools in February. This will provide details about aspects of QCS Test performance, OPs, and selected subject results of groups of students at each school. For comparison purposes the statewide data also will be sent to schools.

¹ The number of OP-eligible students attending a school can be used as a basis for determining categories: large schools have 20 or more OP-eligible students; small schools have 15 or fewer OP-eligible students; and intermediate schools have 16–19 OP-eligible students.

² OAIs are the weighted averages of scaled SAIs that are then banded into OPs.

3. How were analyses of statewide data used to produce parameters needed in the calculations?

Analyses were used to:

- determine parameters used in the process that reduces the effect in the calculation of OPs of the QCS Test performance of students who were very much less or very much more successful in the QCS Test than they were at school
- produce the table of small subject-group achievement band boundaries used to convert small group SAIs into scaled SAIs
- determine the cut-offs for OP and FP bands.

Students are OP-eligible if they complete at least 20 semester units of Board subjects, at least three Board subjects for all four semesters, and the QCS Test. An exemption from the requirement to sit the QCS Test may be granted to students if they provide acceptable documentary evidence of the reason for such an exemption. Although many OP-ineligible students also sit the QCS Test, these students' results are not used at all in the OP calculations. Table 4 provides a summary of the number of students who sat or did not sit the QCS Test in 2000.

Table 4: Students who sat or did not sit the QCS Test in 2000

Total number of students who sat the QCS Test	31 100
OP-eligible students (excluding visa students)	27 430
OP-ineligible students (excluding visa students)	3 198
Visa students	472
Total number of students who did not sit the QCS Test	7 627
OP-eligible students who were granted exemption from sitting:	412
 for medical reasons 	387
 for bereavement reasons 	13
for cultural reasons	0
 for sporting reasons 	12
Students previously eligible who were not granted an exception from sitting	246

The analysis of statewide data shows that there is a high correlation between the way OP-eligible students perform on the QCS Test and the way they perform in their school assessment. In previous years (1992–1999), the QCS/Within School Measure (WSM) correlation ranged between 0.73 and 0.75. In 2000 this correlation was 0.73. The high correlation of QCS/WSM suggests that the QCS Test is a suitable and accurate scaling instrument.

Approximate year-to-year comparability of OPs was maintained in 2000. This process involved finding cut-offs comparable with the 1999 and 1998 cutoffs using a combination of estimates from three methods:

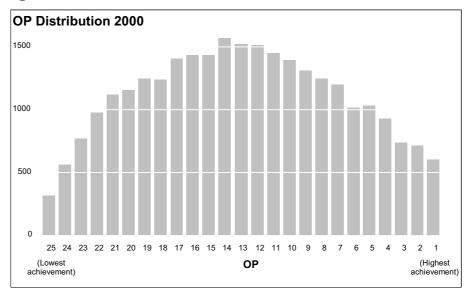
• comparing OAI scales using levels of achievement and multiple regression³

³ Multiple regression is a statistical analysis used to model students' OAIs based on levels of achievement. The results of a multiple regression can be used to examine the relationship between levels of achievement and OAIs.

- comparing the OAIs of students from the two years who were matched based on subjects and levels of achievement
- comparing OAI scales using QCS Test grades.

Figure 1 shows the distribution of OPs in 2000.

Figure 1: 2000 OP distribution



4. How were school datasets analysed for anomalies?

Each school dataset was analysed before the OP calculations were finalised. This occurred in at least two ways to detect possible instances in which one piece of information from a school was grossly inconsistent with other information from the same school.

Statistical analyses of datasets identified cases for which values were outside tolerances for:

- gaps within school subject-group SAI distributions
- relationships of school-group results on the QCS Test and overall achievement indicated by students' levels of achievement.

Tolerances are deliberately chosen to minimise the chances of missing significant inconsistencies.

The results of this process are detailed in 4.1 and 4.2.

4.1 SAI distributions

Over 1400 SAI distributions from school subject-groups were examined as part of the process of checking data supplied by schools. The analysis of SAIs looked for, among other things, unusually large gaps and unusual consistencies in patterns of SAI decisions across different subjects within a school.

Distributions of SAIs were checked against the corresponding Forms R6 for face-value discrepancies for 934 school subject-groups. Schools were contacted when there were questions about the face-value consistency of SAIs placements and the relativities implied by the corresponding Form R6. Forty-three schools were contacted about 98 school subject-groups.

There were alterations to SAIs for 94 of these school subject-groups as a result of these checks.

Possible unusual patterns of SAI decisions across subject-groups within a school were identified using several mathematical modelling techniques. This modelling identified 42 schools where there was an unusual consistency across sets of SAIs. In two other cases there was an unusual clustering of students. The SAI distributions for the 730 large subject-groups within these schools were scrutinised against Forms R6.

Following these analyses, the Board requested the exit folios of work providing the evidence on which SAI decisions had been made for selected students in subject-groups at 34 schools. These schools provided the work of 582 students in 111 subject-groups. For each subject group, Board review officers provided relativities for the selected students based on the evidence in the folios of work. The school was contacted when changes to SAIs indicated by these relativities would resolve the issues identified by the earlier analyses. Schools provided changed SAI distributions for 72 school subject-groups as a result of this set of SAI checks.

4.2 School-group data

The correlation of QCS group mean and average level of achievement group mean for schools was checked. Forms R6 for selected subjects offered at the schools were analysed for information about assessment standards.

Data for subject-groups and whole school-groups were checked to determine whether mean QCS Test performances were very inconsistent with overall school performances. For each school a polyscore⁴ was estimated for each student. School groups with large negative mean residual polyscores were selected. (A large negative mean residual suggests that students in this group tend to have an OAI much lower than their 'polyscore' or estimated overall achievement.) Similarly, school groups with a much larger polyscore spread than OAI spread were also selected for further analysis. (In these cases, the students well above the school mean may on average have OAIs much lower than their estimated overall achievement.)

When information about assessment standards on the Form R6s provides sufficient support, cases of groups with a sufficient inconsistency of QCS Test and level of achievement information are referred to the Board's Appeals Committee for consideration of possible special case calculations. As a result of the Appeals Committee decision, changes to final stage parameters were made for 11 schools. These changes involved raising the mean OAIs at six schools and raising the mean-difference at eight schools to bring these parameters to the values whereby they would not have stood out as outliers.

Eight schools were referred to the Appeals Committee because of issues raised by these schools. The data showed that intervention was warranted in one of these cases.

A simple mathematical model (Sympson, J. B. & Haladyna, T. M. 1988, *An Evaluation of Polyweighting in Domain-Referenced Testing*, paper presented at the Annual Meeting of the American Education Research Association, New Orleans, April 1988) can be used to obtain an estimate of each student's overall achievement starting from levels of achievement alone. These estimates are over-simplifications in that they involve ignoring differences between students with the same level of achievement in a given subject:that is, all VHAs in French are treated equally and so on. As the table below shows, the resulting estimates, 'polyscores', of overall achievement correlate very well with OAIs (the finer-grained scale which is cut into OPs).

Correlation	2000 student data N = 27 836
OAI ~ Polyscore	0.952
OAI ~ QCS	0.760
Polyscore ~ QCS	0.723

This procedure provides estimates of overall achievement independently of the procedures used for determining OPs. The estimates are based on treating each level of achievement in each subject as equivalent. They are not based on treating levels of achievement in different subjects as equivalent, nor are they based on assuming that levels of achievement represent an equal interval scale (that SA is to HA as HA is to VHA, for example). Therefore, polyscores provide more suitable estimates of overall achievement than simple averages of levels of achievement that have been turned into a 5-point scale.

⁴ Note concerning polyscores

5. What was done to analyse individual student data for anomalies?

Individual checks were based on the relationship, for groups of students with similar combinations of subjects, of OAI and average level of achievement (across best five subjects and OAI and individual polyscore. A multiple regression analysis, which models OAIs in terms of levels of achievement, was also used as an overall check. Unlike analyses based on average levels of achievement, both the polyscore and this analysis has the advantage that it does not involve treating a particular level of achievement in one subject as being the same as the level of achievement with the same name in another subject.

Like the polyscore analysis, the multiple regression analysis showed a very good (R²~0.92) correlation of OAIs and levels of achievement. The strength of these relationships means we can look for outliers—cases in which a student has an OAI much lower than the modelled OAI for that student's particular combination of levels of achievement in particular subjects.

For a substantial proportion of the OP-eligible population, manual scrutiny of data was undertaken as an extra check of the integrity of OP calculations. First, computer searches of the data identified students with an OAI much lower than the modelled OAI for their particular combination of subjects and achievements. Each of these searches involved comparing a student with every other student with a sufficiently similar combination of subjects.

Manual checks of around 8000 plots showing these individual student data indicated that further investigation was warranted for 640 of these students, on the basis that these students' OAIs were possibly odd. For these 640 students an assessment record was printed showing semester units, levels of achievement, and SAIs in Board subjects. Panel comments on the relevant Forms R6 were noted and the student's approximate place within an achievement band was found.

Analysis of data for these 640 students found 270 cases for which a change was justified to the student's OAI before the issue of SEPs. The OAIs of these 270 students were increased to the point where they would not be considered outliers.

6. What special case calculations were conducted?

Special calculations were carried out when:

- a school group had a high proportion of visa students (see table 2)
- a school subject-group had a high proportion of visa students (see table 3).

These calculations followed procedures approved by the Board on the recommendation of the Technical Advisory Subcommittee of the Moderation Committee.

7. What was done to print and dispatch SEPs?

In 2000, for the fourth year, SEPs were printed in-house. This brings advantages of enhanced flexibility and efficiency at a lower cost.

In-house printing provides a number of advantages over printing outside. It allows greater flexibility for variable printing of Senior Certificates, which contained millions of items of information and more permutations of that information than ever before. In-house printing also provides easy access to programmers during the development phase, as well as the printing phase. Programming issues that appear during the printing of SEPs are resolved as they occur.

The program to print SEPs was written in Oracle Developer 2000 by Board officers. It is worth noting that Oracle Developer 2000 is designed to be used for reports of fewer than 100 pages; in 2000 the Board's programmers used it to produce about 200 000 pages of SEPs.

Extensive hand checks of all certificates for production quality were conducted before dispatching. A quality-control loop was in place that allowed scrutiny of every SEP printed. Necessary changes were made to computer programs. (One aspect that could not be entirely resolved during this quality-control phase was the naming of Recorded subjects supplied by TAFE. Some TAFE Recorded subjects have names that are abbreviated in a way that readers of the Senior Certificate who are not familiar with these VET terms would find difficult to understand. Considerable time was spent by Board staff before printing certificates, identifying and correcting spelling errors in the names of TAFE Recorded subjects, as well as identifying and correcting inconsistencies in abbreviations of the same TAFE Recorded subject.)

All timelines were met.

The scheduled date for posting the SEPs was 15 December 2000. To maximise the probability that all students would receive their certificates on the same day, posting occurred over two days—Thursday 14 December for students living interstate, overseas, and in the remote areas of Queensland; and Friday 15 December for the remaining students. In 2000, SEPs were posted to 561 Australian postcodes and five overseas zones.

The schedule encountered no major problems, and 38 727 Senior Certificates and 28 288 Tertiary Entrance Statements (including those for visa students) were posted. Computer programs were used to ensure that every SEP had a precise known position in the packing production line.

As in previous years, three '1800' telephone lines were set up on Tuesday 19 and Wednesday 20 December for students to enquire about their OPs and FPs. There were 431 calls made on these 'hot lines' over those two days (compared with 516 in 1999 and 355 in 1997). In addition, the Board's Information & Executive Services Unit received 300 telephone calls over those two days from students (and their parents) who discussed issues to do with the SEP. The office was staffed throughout the Christmas and New Year period, with the exception of public holidays.

In 2000, for the second time, the Board posted a 'How do students find out about Year 12 results?' page on the website. There were more than 3300

visits to that page during December (in 1999 there were more than 1000 visits). Also during December, 68 students (and their parents) used email to request that they be provided with further details about the SEP.

In addition to the mailouts to schools listed in section 2, on Monday 18 December, each school was sent a report showing details of its students' results: levels of achievement, OP, FPs, and QCS Test grade. This year, for the first time, these school reports were also made available to schools in an electronic format over a secure internet site. One hundred and twenty-four schools retrieved an electronic copy of their reports using the internet site. Because the privacy of students and schools must be safeguarded, it is necessary to maintain security over internet data transfers and to develop the effective use of user identities and secure passwords.

8. What tertiary admissions data were electronically transmitted?

Year 12 and tertiary entrance data were sent electronically to all tertiary admissions centres and interstate universities that had received applications from Queensland students. The interstate admissions centres submitted to the Board the names of Queensland students who applied through them, and information about these students only was released.

The Queensland Tertiary Admissions Centre (QTAC) was supplied with a file of Year 12 student results (external and internal) by Friday 15 December 2000. Interstate authorities received data after 18 December 1999.

One thousand seven hundred and seventeen Queensland students applied to interstate universities in 2000 (in 1999 and 1997 there were respectively 1117 and 1275 such students). In 2000, the Australian Tertiary Admissions System was used to convert the OPs of students applying to interstate universities. The system uses the common Interstate Translation Index (ITI), which is a common scale used to convert the TE rank of one State to that of another. Each State is responsible for the conversion from home state TE rank to ITI. This conversion is based on a nationally approved combination of two methods previously used for interstate equivalences—the candidature method and the age cohort method. The approved approach is based on principles appropriate to the inherent imprecision of both the starting data and the nature of conversion from one state rank to another.

9. What was done to process applications for verification (Senior Certificate) and review (Tertiary Entrance Statement)?

Students had until Monday, 8 January 2001 to lodge an application for verification of their Senior Certificate and to seek review of their OPs and FPs. Late applications were accepted on the next day.

In 2000, there were 644 of these applications received, which was a decrease of 38 from the 1999 figure (682).

Students' applications can be classified into five main categories:

A. Change of name

B. Verification of result in Board and/or Board-registered subject

Most of these applications related to differences between the levels of achievement as stated on the student's exit statement or school report and those shown on the Senior Certificate. Schools were asked to verify results.

C. Correction of result in Recorded subject

D. Review in relation to OP/FPs

There were 525 students who applied to have their OP reviewed (45 fewer than the 570 applications in 1999, but 23 more than the 502 applications received in 1998). In each case a comparison was made across the State with students with similar results in a similar combination of subjects. Further checking of available information was made if this preliminary check showed the student who applied for the review had an OAI apparently much lower than the OAIs of other students with similar results in a similar combination of subjects. A panel of senior Board officers examined each case and made a determination on whether the calculation of a correction factor (to bring the student's OP into line with those of others with similar results) was warranted.

E. Other

An application for verification regarding the QCS Test result led to a check that an individual grade was correctly calculated. Since multiple marking of QCS Test papers had already occurred, there was no further re-marking.

A summary of the successful applications for verification and/or review (correct at the time of writing, at the end of January) is given in table 5 (final figures may be different).

Table 5: Amendments to student results

Changes to levels of achievement (number of students)	
• Board subjects	0
Board-registered subjects	0
• Recorded subjects	15
• External subjects	2
Changes to OPs	34
Changes to FPs	0
Changes to QCS grades	0

As soon as amendments were available, they were transmitted by the Board office to QTAC and tertiary admissions centres in other States.

10. Conclusions

Issuing the SEPs in 2000 was more complex than the same task in 1999. The amount and complexity of the information collected and reported, as well as the quality assurance required, continue to increase. Much of this complexity comes from the reporting of accredited vocational education on Senior Certificates. While the activities involved are diverse and often complex, they share a single aim, which is to provide a high-quality credentialling service to the Board's most important clients—students.