

SUBJECT ACHIEVEMENT INDICATORS (SAIs)



Although we present seminars about SAIs in schools and to groups of teachers around Queensland each year, we still receive many enquiries about the best way to assign SAIs, especially from teachers who cannot attend a seminar. These questions are asked frequently by teachers. The answers that follow are based on the seminar presentation.

Q A

Why do we need SAIs?

In Queensland's system of externally moderated school-based assessment we do not compare students' work when we make decisions about levels of achievement (LOAs). However, for tertiary entrance, where students are competing for limited places, we do need to compare their achievements. We do this through the Overall Positions (OPs). To calculate OPs we need information from teachers in schools about how well students have performed against the competition in their subject-groups. In order to obtain more fine-grained information than the LOAs provide, we ask teachers to assign subject achievement indicators (SAIs) to all the OP-eligible students in their subject-groups. This information is used with what the Queensland Core Skills (QCS) Test tells us about the groups of students in subjects and schools to calculate OPs.

What are SAIs?

SAIs are indicators of students' relative achievements within a subject-group, within a school. They show finer distinctions between students' achievements than you can show on the Form R6. They indicate the rank order of students and the gaps between students' achievements in large groups (14 or more students). They are professional judgments made by teachers, based on demonstrated student achievement. They cannot be determined mechanistically. Assigning a level of achievement (LOA) to a student's folio of work is an absolute judgment. If the work matches the descriptors for an LOA then the student receives that LOA. SAIs are not absolute values, nor are they scores or percentages. They are not based on feelings about students or their work or what they might have achieved if their circumstances had been different. Teachers look at the evidence in students' folios to identify whether there is a difference between students' work and how big that difference is. These differences are then represented through the SAIs.

SAIs are represented as numbers between 200 and 400, giving a range of 201 points. These numbers cannot be compared across subjects at this stage. It is not until SAIs are scaled that the achievements of students can be compared across subjects in the same school. This scale is used to emphasise that SAIs are teacher decisions, not percentages. The student at the top of the group is assigned 400, regardless of the level of achievement the student was awarded.

There could be more than one student with an SAI of 400. Being assigned the 400 means that a student was more successful than anyone else in that subject, at that school, in that year. Being assigned the 200 does not mean that the student was not successful; rather, it says that that student was less successful than anyone else in that subject, at that school, in that year. Theoretically, the 400 in a subject in a school could be assigned to a student or students who have any LOA, as could the 200. In fact, we have seen large groups where all the students achieved Very High Achievements. This means that for that group, the student assigned the 200 was a VHA student. This is unusual, but it does happen.

How do SAIs fit into the Queensland system of school-based assessment?

Queensland's system of externally moderated school-based assessment involves matching student work with the standards for each level of achievement (LOA) in the relevant syllabus. The moderation system allows us to be confident that a student's folio that has been assigned a particular level of achievement in a particular subject at one school will be of a comparable standard to that of a folio of work in the same subject at another school that has been assigned the same level of achievement. However, LOAs are broad measures. We need teachers to make finer distinctions among students for tertiary entrance purposes. Therefore, SAIs are about relative, not absolute, achievements. An SAI shows a student's achievement in relation to other members of the subject-group whereas an LOA is assigned in comparison with syllabus standards. However, like LOAs, SAIs represent teacher judgments, which are based on the teachers' knowledge of their students' demonstrated achievements.

What do schools do?

Schools make decisions about SAIs on the basis of differences in demonstrated achievement. The differences must be features of student work that can be identified and pointed out to a reasonable audience. This way, the evidence supports decisions. Teachers, who know the students' work, should make SAI decisions independently in each subject. They use their professional judgment to make decisions about where students' work should be placed in relation to statewide standards for levels of achievement and their professional judgment is also used to decide SAIs, which are relative achievements. Neither process of decision making should be driven by anything other than evidence. Once SAIs have been decided they must be displayed so that students can check them. QSA policy requires schools to display SAIs, but it is also helpful to encourage a culture of questioning and checking in schools so that students are partners in the process.

SAIs are assigned differently for large, intermediate and small subject-groups but all SAIs are the result of teacher decision making.

The standard procedures used for assigning SAIs for large groups are modified for small and intermediate-sized groups to take into account the fact that in Queensland, students study in groups of different sizes.

Where the subject-group in a school is small (1-9 students) or intermediate (10-13 students), the students' positions on the Form R6 become their SAIs. The R6 positions that are determined and confirmed with the review panel become part of the information used in scaling procedures as part of the OP calculations. This takes into account that the QCS data on means (averages) and mean differences (spreads) for small or intermediate groups are not as useful as those for large groups. This is because the results tend to be unstable where the dataset is too small. That is, the QSA cannot use the QCS test results of a group to reliably find the mean and mean difference if they do not have a reasonably sized group.



What are features of good decision making?

Good practices in SAI decision making are based on a whole school approach. This helps ensure that across the school SAIs are decided by teachers in the different subjects using students' demonstrated achievements. There should be quality checks on the data at various stages of the process. These checks mean that SAI decision making is open and accountable. The approaches explained in the seminar suggest that there are several elements that are crucial. Some of these are set out below.

Make the SAI process open and accountable

- 1 Plan an assessment program that allows for fine discrimination among students and allows them to show their strengths.
- 2 Maintain full and up-to-date student folios and profiles.
- 3 Familiarise students with the notion of rank order of achievement.
- 4 Carefully check special cases before assigning SAIs.
- 5 View SAIs as being a final decision in a two-year decision-making process about students' achievements in subject-groups.

Assign SAIs by:

- assigning levels of achievement
- developing a rank order of all OP-eligible students
- deciding the gaps between students within each level of achievement
- deciding gaps between levels of achievement
- assigning SAIs
- auditing against the Form R6 to ensure that there are no large inconsistencies between the two sets of data.

Check decisions by:

- reviewing inconsistent performers
- checking against the initial rank order
- looking at the overall SAI distribution
- auditing against the R6 (the R6 and the SAIs should not be incompatible)
- showing students their SAIs by the Wednesday after the Year 12s leave in November.

Remember:

- The best people to make decisions about the rank order of student work and the relative gaps between demonstrated achievement are the teachers who know the students' work.
- It would be wrong for someone to change SAIs in a way that means decisions are no longer based on the demonstrated achievement in students' work.



SAIs: how and when?

The QSA recommends only one method for assigning SAIs for students in any sized group: making decisions on the basis of evidence. There is **no** computer program the QSA recommends for **calculating** SAIs. SAIs are assigned, not calculated. Any program which claims to calculate SAIs will be making decisions based on something other than the evidence in the student folios. In our experience, a program like this will probably advantage some students and disadvantage others. This is not what SAIs are designed to represent.

The QSA does have a software tool, called *SAI Assign*, that can be downloaded from our website (www.qsa.qld.edu.au/publications/SAIAssign.html). *SAI Assign* “talks to” the Student Data Capture System (SDCS) that has all your school data. *SAI Assign* provides a screen with all the students’ names, in level of achievement order. The application then lets the teacher move students on the screen. There are several options for moving students on the screen that can help the teacher record decisions about students’ relative achievements. Once the teacher has made the final decisions, the application will assign numbers from 200 to 400 and give you a printout.

We suggest two approaches to making large group SAI decisions that may help schools implement this method. Schools can decide their own approach to SAI decision making as long as the approach implements the evidence-based method.¹

Approach I

Approach I has two steps. The first step involves rank ordering the students’ folios. Provisional levels of achievement have already been decided, and teachers place the students’ folios (or profiles) in order from the most successful student to the least successful student.

With each group of students in a level of achievement band, examine the profiles, starting with the VHA group. Determine the best folio and make this student “top of the group”.

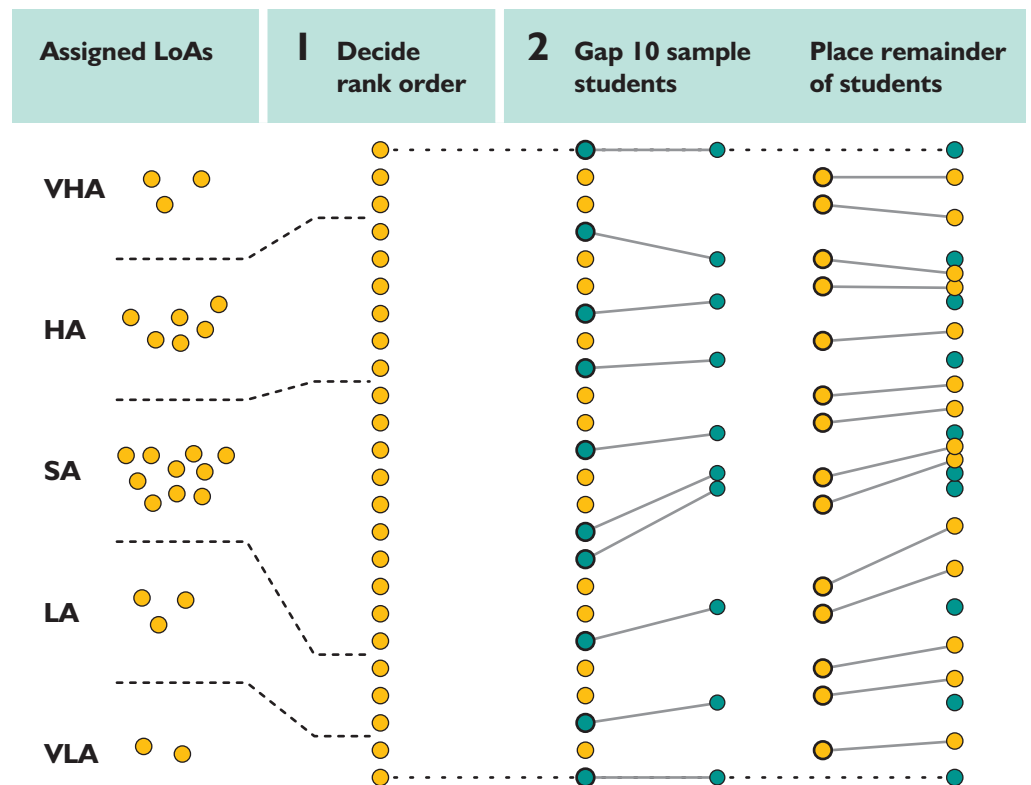
Remember that “ties” may occur. If using only profiles, the folio may be needed to make difficult decisions or to confirm rankings. Examine the remaining folios in the band, compiling the rank order of VHAs. Continue with the other level of achievement bands through the HAs, SAs, LAs and finally, the VLAs. It is important to get this initial rank order right, so it may be necessary to refer frequently to the work in the students’ folios.

1. Many schools use other approaches that also involve basing decisions on evidence. For example, teachers may lay folios out in the rank order/in a line, and move them closer together or further apart as they adjust their decision making. This is in essence the same kind of decision making process as in *SAI Assign*, since the decisions are based on the evidence in the folio.

The second step of the process involves making judgments about the relative placement of folios. Teachers will need to decide on how to physically record their decisions. These instructions are based on using a length of lined paper which has 201 lines. As each decision is made, place a mark on the scale to indicate the placement. The following steps are helpful:

- Select a sample of about ten consistently performing students from across the whole range, including the top and bottom students of the cohort.
- Mark a place at the top of the line you have drawn to represent the top student. Mark a place at the bottom of the line to represent the bottom student.
- Closely examine the work in the folios.
- Do a series of pair-wise comparisons to determine whether one folio is closer to or further away from another.
- Mark the position of each folio on the scale between the top and bottom marks as a decision is made, to represent the achievement of each folio.
- Insert the rest of the students in relation to this “pegged” sample.

The result is a set of relative positions of students’ achievements that are represented on a linear scale. Place the numbers from 200 to 400 on the scale. The process is represented below.



Approach 2

Approach 2 is best for very large subject groups with many class groups. This approach allows teachers to work on SAI decision making in more manageable chunks. This approach has three steps.

Step 1

Decide the overall rank order for students. This can be done initially by teachers for their own class groups. Students have been awarded provisional levels of achievement and are ordered from the “top” student in each class to the “bottom”, according to the demonstrated achievement in their folios. It is possible to use only the profiles at this stage, but folios may be needed. The group of teachers now works together to place the students from their classes into the overall rank order. With each group of students in a level of achievement band, examine the folios, starting with the VHA group. Determine the best folio and make this student “top of the group”. If using only profiles, the folio may be needed to make difficult decisions or to confirm placements. Examine the remaining folios in the band, compiling the rank order of VHAs. Continue with the other level of achievement bands through the HAs, SAs, LAs and finally, the VLAs. It is important to get this initial rank order right, so it may be necessary to refer frequently to the work in the students’ folios.

Step 2

Make decisions about the relative achievements demonstrated by the work in the folios within each of the achievement bands for which you have just compiled a rank order.

You are now making decisions about gaps. The following steps are helpful in this process but remember it is essential that the group of teachers works together to make these decisions:

- Rule a line on a page. For this exercise you need a scale, not necessarily a certain number of lines.
- Mark a place at the top of the line you have drawn to represent the top student in the VHA band. Mark a place at the bottom of the line to represent the bottom student in the VHA band. These may not be “top” or “bottom” VHAs; they are simply the most and least successful students in the VHA band.
- Closely examine the profiles and, if necessary, the work in the folios.
- Decide the gaps between these students.
- Repeat the process for the other achievement bands.

Make judgments about the relative achievement demonstrated by the work in selected folios — the top and bottom in each achievement band. Teachers come to agreement on relative placement of these folios and as each decision is made, an indication of the relative placement representing that decision is made, again on a length of paper with 201 lines, using the following steps:

- Closely examine the profiles and, if necessary, the work in the top-placed and bottom-placed folio in each achievement band.
- Make a decision about the relative achievement demonstrated by the work in each selected folio with respect to the top-placed and bottom-placed folios.
- Represent these decisions by marking a place on the line for each selected folio.

The result is an agreed set of relative positions of the achievements demonstrated by the work in the top and bottom folios from all achievement bands. These decisions have been represented on a linear scale.

rungs, showing which LOA standard each student met and giving an indication of how well the standard was met. Panels then use the Form R6 to provide advice to schools about how they are applying the standards. They may also provide feedback about assessment practices. At Exit, the final rank order is used to help teachers allocate SAIs. By this stage, students have completed more assessment, so the rank order may have changed a little since verification. The outcomes of the decision making for assigning SAIs and the decision making for completing the Form R6 are different in terms of what they represent, but there should be a clear relationship between them.

Schools develop assessment programs that allow students to demonstrate what they know and can do.

Students demonstrate differing degrees of success on assessment tasks. The range on the SAI scale from 200 to 400 (for large groups) means that there are 201 points at which students may be placed. When the rank order is placed on the Form R6, it is rare for all fifty rungs to be used. Some students will end up on the same rung, even though teachers may have thought their work was slightly different.

If teachers do a linear translation from the Form R6, this means that information from the rank order at Exit, which was collapsed when placing students on the (maximum) 50 rungs of the Form R6, would be lost. If teachers do not go back to the original rank order and student profiles, then students on the same R6 rung would always receive the same SAI. Some students could be disadvantaged because the original rank order may have shown that their work was different. It also means that the teacher is saying that the differences in achievement are exactly the same across all levels of achievement when this may not be so.

From the work we have looked at here at the QSA, we think that differences increase as you move up the levels of achievement. That is, if you compare two folios in the LA band and then compare two folios in the VHA band, there will be more difference between the two VHA folios, even though they are the same number of rungs apart.

How can teachers determine differences between students on the same R6 rung?

When students are placed on the same rung on the Form R6, this does not necessarily mean that they were equal in the original rank order. Teachers need to consider:

- Principles of assessment: fullest and latest; increasing complexity of challenge; increasing independence. When was each task completed? Did students receive support?
- The types and demands of tasks. How well did each student do on assignments compared with those completed under test conditions? How do students perform on non-written tasks? Did they work individually or as part of a group?

Students end up on the same rung on the Form R6 in different ways. Some manage to reach the rung by the end of the year but have been steadily improving. Based on the principle of “fullest and latest”, this student might merit a slightly higher SAI than someone whose work has been steadily decreasing in quality across the year. They might each be different from someone who has stayed largely the same all year. What we ask is that you look at students who are on the same rung. If you can see a difference, then represent it. If you cannot see a difference, then give the students the same SAI. You will have more room to represent these differences if your group is not a very big one. Clearly, this is harder to do if you have large numbers in a subject-group.



What checks does the QSA do once teachers send in their SAIs?

The QSA perform checks, or what could be called SAI surveillance, on the data they receive from schools that are related to SAI decision making. These are checks on the inputs into the OP calculations that take place within a framework of quality assurance. When SAIs arrive on Disk 5 at the QSA, sets of SAIs are analysed to check for apparently large, face-value inconsistencies. These checks involve identifying any possibly odd distributions that may not match the data on the Form R6. The Form R6 and the SAIs are related but they need not be identical. If an apparently large face-value inconsistency is identified, the QSA will contact the school. The QSA will ask schools to reconsider any data that seem inconsistent and may ask for samples of student work in order to perform further checks.

What kinds of difference between students' achievements are acceptable?

The QSA also examines “whole school” sets of SAI data, looking for unusual patterns and if these are found, the school will be asked to send in particular students' folios of work. This means that schools need to have student work available and ready to send in at short notice if such checks are required. Each year we invite staff from schools to help us carry out these checks. This makes the process open and accountable.

When we examine the relationship between Forms R6 and SAI distributions we do not look at one single feature in isolation. We look at the whole distribution in context: gaps and relativities across the entire set of SAIs. We want to identify those SAI distributions about which a reasonable person would expect us to raise questions. We do believe that as we move up the levels of achievement (from VLA to VHA) that there will be more difference between folios. That is, when we compare two folios in the LA band and two folios in the VHA band, the folders at VHA level may have a larger gap between them than the LA folios, even though they may be the same number of R6 rungs apart.

However, the QSA often calls in student folios for examination by independent experts. They look at student folios and assign relativities on the 200 to 400 point scale. These experts have never found a case where the difference between students at any place in the distribution was twice that between two students elsewhere. That is, the difference between two students' folios in the SA band would not be twice the difference between two students' folios in the VLA band when they are the same number of rungs apart. This is true across all levels of achievement.

The report the QSA issues each year — *Student Education Profiles: Preparation, distribution, appeals* — includes a summary of the checks the QSA makes in comparing SAI distributions and the Forms R6.

Why doesn't the QSA decide the widths of LOAs in the SAI decision making process for large groups so teachers can use them as a guide?

Good decision making about SAIs should not be influenced by a concern with being picked up by the QSA. These checks are made so that no student is advantaged or disadvantaged. The rule we use is that a reasonable and disinterested person looking at the data on the SAI distribution and the data on the Form R6 should not see obvious inconsistencies. Every distribution is different and is looked at on its merits. If the QSA were to set band widths, then teachers would not be using their professional judgment to assign SAIs.

What is anomaly detection?

Anomaly detection is another form of quality assurance that looks at the OP calculations. We check to ensure that student results are a fair and accurate representation of their achievements at school. We check the relationship between what a student achieves at school and the outcome of the OP calculations. We do these checks on the school's group data and for every student before finalising OPs. If a student's OP will be significantly below what they might expect, given their levels of achievement, we may intervene to lift the OP.

Glossary

Overall Position (OP): Overall Positions, or OPs, provide a statewide rank order of students (on a 1 to 25 scale, 1 being the highest) based on students' achievement in Authority subjects studied for the Queensland Senior Certificate. A student's OP shows how well that student has performed in their senior studies when compared with the performances of all other OP-eligible students in Queensland.

OPs are used in the selection of students for tertiary education courses. They are used by tertiary education institutions as one basis for selecting applicants for a course when there are more eligible applicants than quota places for that course.

SAI: An SAI is a Subject Achievement Indicator. OP-eligible students are assigned SAIs by their teachers for each Authority subject they study. (Results of OP-ineligible students do not contribute to group results for calculating OPs and FPs.) OP-eligible students are placed on a scale that shows the rank order and the gaps between students.

The top position is labelled 400 (for the top student) and the lowest position is labelled 200. Other students are placed somewhere in between these points, depending on how different their results are from each other. An SAI is not a percentage and has a meaning only when it is seen in relation to the SAIs of all other OP-eligible students in that subject in that school.

The QCS Test: is a cross-curriculum test and it assesses achievement in the 49 common curriculum elements covered by students across their senior subjects.

From the results we test the strength of subject-groups so that we can create a ranking within a school, and then a ranking within the whole state. The test results provide group parameters (average and spread of performance) for subject-groups of students in each school and for all school groups in the state. This means that SAIs provided by each school can be scaled fairly before being combined to determine a student's position in a statewide rank order of overall achievement.

Moderation: is the name given to the quality assurance process for senior secondary studies used by the QSA to ensure that:

- Authority subjects taught in schools are of the highest possible standards,
- student results in the same subject are comparable across the state, and match the requirements of the syllabus, and
- the process used is transparent and publicly accountable.

The system of moderation is based on a close partnership between the QSA and the schools. The QSA contributes the design, operation and servicing of the structures that allow the system to operate. It accepts the responsibility for training the people who serve on review panels to review school work programs and student results. On their part, schools contribute the services of teachers as review panellists, and are responsible for developing and implementing work programs in line with syllabuses, and for assessing students' work against statewide standards. They collect the student work samples and data necessary for their students to receive Senior Certificates.

Form R6: Completion of the Form R6 is initiated by the school at the time of preparing a submission for October verification as part of the moderation process.

The sequence of actions in completing a Form R6 is described below.

Staff of the school complete the October column to indicate the relative achievement of each and every student in the Year 12 cohort who has completed (or is in the process of completing) at least one semester of an accredited school work program in a Board subject and is expected to receive a Senior Certificate at the end of the year. The relative achievements are indicated by writing, on the appropriate rung, the number of students who have achieved at that particular level. The relative achievement of each sample student whose work is sent to the verification meeting is indicated by a letter code (A, B, C, ...). For example, where there are four students whose relative achievements are shown on the same rung and where one of these is sample student B, the Form R6 shows 3 + B on that rung.

Level of achievement: is an assessment provided by teachers of, in broad terms, how well a student met the achievement criteria and standards for a particular subject.

The level of achievement is an indication of the global level of performance in the subject at the termination of a course of study in that subject. The criteria for awarding a particular exit level are contained in the subject syllabus.

Students receive one of five levels of achievement. Levels of achievement have the following labels: VHA (Very High); HA (High); SA (Sound); LA (Limited); VLA (Very Limited).

There is no limitation on how many students may receive a particular level of achievement. Any student who meets the standards for a particular achievement level specified by the subject syllabus will be awarded that level.

