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University Selection in Queensland:
From a Single Index to a Profile

1. INTRODUCTION

In Queensland, along with other states, selection for higher education has been an increasingly vexed issue over the past two decades. The problem has been exacerbated by the interaction of two related factors: a dramatic increase in the retention rate to year 12 and greater demand for places in higher education, with intense competition initially in some faculties in some older universities, but increasingly in most faculties in universities and TAFE (Technical and Further Education) colleges. This intense competition has resulted in many highly qualified applicants for the scarce places in universities being denied a place in the course they nominated as their first preference. This has had a number of important consequences. There are pressures on the system from politicians and the public for the system to be more equitable and accountable. There is also an increased pressure placed on the selection process by students who are unsuccessful in gaining entry to their preferred course entering an alternative course with a view to transferring to their preferred course later on.

In this paper, we will trace the history of university selection in Queensland and provide a rationale for the decisions taken. The major focus will be on the events which led to the Viviani review in 1990, the findings of this review and their rationale. We conclude by drawing implications for future directions and the extent to which they embrace new directions in curriculum and assessment which are implicit in national perspectives.

2. HISTORICAL BACKGROUND

Thirty years ago, entry to higher education in Queensland was by matriculation, determined by passes in a minimum number of subjects in the Senior external examination which was administered at the end of year 12 and acted as the gateway to higher education. With ample places available in the one university in Queensland for all matriculants able to pay the fees and wishing to enrol, selection per se was not an issue. Entry to the teachers' colleges was by scholarship, with more places available than matriculants wishing to avail themselves of these places. The Commonwealth Government provided scholarships which covered fees and provided a means-tested living allowance to encourage university studies. State governments and other potential employers also offered scholarships, fellowships and other financial incentives as a means of recruiting graduates into the future workforce.

Since that time, retention rates in upper secondary schooling have continued to increase, with a consequent increase in the number of students seeking entry into higher education. Although the availability of places in higher education has also increased, at times quite dramatically, it has not kept up with the demand.

Because earlier changes in demand were readily extrapolated from trends over time, problems were tackled as they emerged. Solutions consisted of small, incremental shifts designed to address particular crises as they occurred rather than any fundamental re-examination of policies and practices. Over time, two major problems emerged. The curriculum in Years 11 and 12, once seen as preparation for higher education, now had to cater for increasing proportions of students who would not enter higher education. Secondly, pressure for places in higher education was intense and fundamental questions were raised about equity and access (Baumgart, 1987;

McGaw
et al., 1986).

3. ANALYSIS OF MAJOR CHANGES

It was the late sixties before pressure for places at the University of Queensland stretched its capacity to enrol all matriculants. Until this time, students were admitted

if they passed a minimum number of Year 12 subjects, typically including English, Mathematics and one or more Science subjects. Subsequently, under increased competition for places, students had to obtain better than pass grades in some if not all of their subjects. As entry requirements were raised, variations developed across courses and institutions and a hierarchy developed. There followed a series of changes to the curriculum, assessment and reporting following major reviews of upper secondary education in Queensland. Of the changes which occurred, three can be regarded as watersheds in the extent to which they brought about fundamental change.

The first watershed change was a move to school-based assessment following the Radford (1970) Report. With a broader range of students proceeding to Year 12, there was concern about the backwash effect of university entrance requirements, operationalised in external examinations, on school curricula. With the introduction of school-based assessment in 1973, teachers had considerable autonomy in developing relevant local applications within the subjects devised by the Board of Secondary School Studies and were responsible for the setting and marking of examinations within their schools. Moderation meetings of teachers were held to maintain comparability of standards across schools.

Although this first watershed decision did have the educationally desirable outcome of minimising the impact of university entrance on school curricula, it resulted in further pressure on selection decisions. Teachers attending moderation meetings

faced a conflict in defending the assessment materials, standards and grade distributions for students from their schools while reviewing those proposed by teachers of other schools. As teachers tried to accommodate both roles, one consequence was an inflation of grades across the system. While the moderation process may have achieved comparable grades across schools, the universities found they could not predict how many would qualify for entry and typically the number who met minimum entry levels exceeded planned enrolments.

A new selection method was introduced in 1974 (and used until 1992) whereby all eligible students were provided with a tertiary entrance (TE) score. The TE score provided a single ranking of eligible candidates across the state, irrespective of school or subject combination. Achievement scores provided by schools were scaled against

the Australian Scholastic Aptitude Test (ASAT) which was the only common test completed by all students. (This process of course equating for students studying different combinations is used extensively in Australia (see Sadler (1992); Masters (1988); and Maxwell (1987)). Where a common test such as ASAT is used, the course equating procedures are well known, but perceived bias within ASAT (on gender, or verbal v. quantitative preferences) has led to numerous criticisms, validations, reviews and modifications in various states and territories (Adams, 1984; Daley, 1985; McGaw, Warry & McBryde, 1975; McGaw et al., 1986; Masters & Beswick, 1986, Edwards 1992).

The assessments for all students in a subject at a school were scaled (mean = ASAT mean; s.d. = 12). Each student's aggregate was obtained by adding the best adjusted scores for 20 semester units over Years 11 and 12, provided at least three subjects were studied over four semesters. The aggregate scores for all students in a school

were finally rescaled to yield a distribution with the mean and standards deviation corresponding to those of ASAT scores for all students receiving a TE score in that school.

In ranking all students in the State, TE scores were assigned as percentile bands with the number of students in each band set a 0.5% of the number of 17-year-olds in the State (except for the top band which contained 1%). The scale started at 990 and moved down in steps of 5 until all eligible students had been allocated a band. In the early years of the system, the lowest bands used were around 750 but this drifted down over time to reach 465 in 1992 as the retention rates in senior secondary schooling increased. In effect, this procedure placed all eligible students into half-centile bands. The underlying assumptions of this procedure were that eligible students were all from the 17-year-old population and that the achievement of eligible students was greater than the potential achievement of ineligible students.

In a nutshell, the TE score provided a fine-grained scale which was convenient for universities because it allowed them to set and fill quotas without reference to additional information.

A second watershed in Queensland was a move from norm to criterion referenced

assessment known as ROSBA, the acronym for a Review of School-Based Assessment (Scott et al., 1978). When school-based assessment was introduced in 1973, research studies (Campbell et al., 1976; Campbell and Campbell, 1978) found that the amount of assessment had increased, perhaps as teachers sought to justify their decisions in moderation meetings; school-based implementation of syllabuses showed an emphasis on content at the expense of process objectives; and the competitive nature of norm referenced assessment at the school level was considered to affect student-teacher

relationships. The Scott Report recommended assessment based on defined performance criteria and reporting on a five-point scale. In the first system-wide attempt in Australia to move from norm referenced to criterion referenced assessment, the Queensland system implemented the recommendations of the Scott Report, first on a trial basis, and then progressively with full implementation in 1986. The initiative required rewriting of syllabuses to emphasise outcomes and considerable professional development for teachers.

This method of assessment provided a level of achievement for each student in each subject studied. However, it provided little information to assist universities in selecting students. Levels of achievement cannot be meaningfully compared for students studying different combinations of subjects or aggregated across subjects. Thus, it is easy to see why universities ignored this important innovation and continued to use TE scores as the major tool in selection.

This second watershed decision, again highly desirable educationally, had virtually no impact on selection for higher education. Although the criterion referenced assessments featured in the Senior Certificates issued to year 12 graduates, the norm referenced TE scores, statistically moderated with ASAT, provided an incongruous overlay but remained as the basis for selection.

The third watershed involved a move towards profile reporting for selection purposes. Although the TE score has provided universities with a low cost and objective method of filling their quotas, it has been the subject of a host of public criticism. The intensity of the criticism probably reflects the community's aspirations for higher education which has outstripped the ability of the sector to provide places to match the demand. Thousands of qualified students are not being offered places, a problem further

compounded when applicants who miss out apply again in subsequent years, sometimes having accepted places in courses with lower quota cut-off scores

in an attempt to upgrade to their first choice. As a result, school leavers face even greater competition.

An important criticism of the TE score was whether a single aggregate can operate validly and fairly to select students for all courses. The construct validity of an aggregate can be challenged when not all components correlate similarly with the total score. Predictive validity studies have indicated moderate-at-best correlations between TE scores and subsequent performance and considerable variations in coefficients when particular subjects are used as predictors. Similar variation in coefficients between the ESC and university success in New South Wales are reported by Manning (1992).

Anomalies such as the selection of students in Mathematics and Science courses in secondary school into Arts/Law courses ahead of students with high grades in Language/Humanities subjects but lower TE scores are cited as evidence of the irrationality of such procedures.

In 1986, a committee was established to review all aspects of entrance to tertiary institutions in Queensland and its report (Pitman, 1987) made 52 recommendations for change. Although the committee was broadly representative of schools and universities, a number of universities balked at the potential impact of the recommendations and subsequently criticised aspects of the report publicly. In the absence of support from all parties and undergoing a difficult time politically, the government of the day was not willing to press ahead and only two of the 52 recommendations were implemented. In spite of the overwhelming evidence that selection using the single-index TE score had outlived itself, it continued to reign as the major selection tool because of its ease of use, and the absence of a viable alternative.

A second review (Viviani, 1990) was initiated by the new Labour Government which acted quickly to implement its recommendations. The review endorsed the use of

school-based assessment but recommended the replacement of the single fine-grained

TE score with a student education profile to contain a number of coarse-grained scales

able to be used in different combinations for selection into different university courses.

Professor Viviani described the system as 'horses for courses' implying that the

selection criteria for each university course should match the skills and prerequisite

knowledge relevant to that course.

The student education profile provides two certificates. The Senior Certificate records

student achievement in subjects studied in Years 11 and 12 as previously, together

with a result on the new Queensland Core Skills Test, replacing ASAT. The Core Skills

Test, an omnibus test of four papers administered to Year 12 students, is based on the

skills and processes contained in the 40+ accredited Board subjects. Forty-nine

curriculum elements have been identified for inclusion in the test. The criteria for

inclusion are that a curriculum element must be covered in at least two subjects, that

at least 95% of students have studied at least one of the subjects containing the

element, and the element can be assessed using a written examination. A 5-point scale

is used in reporting achievement for the overall test on the Senior Certificate. Use of

this profile of achievement by employers and universities in selecting applicants will

start to bridge the gap which has developed over the past 20 years between certification and selection.

A second certificate, the Tertiary Entrance Statement, provides rank order information

for university selection. Students obtain an Overall Position (OP) but, in contrast to the

TE rank, the OP is a coarse-grained 25 point scale. It is derived by averaging with equal

weights the scaled scores on the best five subjects (usually out of six) for each

student. In addition, supplementary information is provided as positions in up to five

fields. The skills particular to each field are developed in a number of

subjects across
the curriculum. The fields are:

FIELD A: Extended written expression involving complex analysis and synthesis of ideas.

FIELD B: Short written communication involving reading comprehension and expression in English or a foreign language.

FIELD C: Basic numeracy involving simple calculations and graphical and tabular interpretation.

FIELD D: Solving complex problems involving mathematical symbols and abstractions.

FIELD E: Substantial practical performance involving physical or creative arts or expressive skills.

Within each subject, a weighting is given for each field to reflect its emphasis in the assessment, as specified in the accredited syllabus. Student achievement in each subject is then weighted by these field weights in the calculation of field positions. If students' choice of subjects does not allow a minimum level of exposure to a field, no field position is assigned. Typically, students will be eligible for field positions in 2-3 of the 5 fields.

Because of the coarse-grained nature of the OP, university faculties will need to use additional information, including field positions, to select students at the margin.

4. IMPLEMENTATION OF A PROFILE

As discussed earlier, most of the changes in selection procedures were implemented on an 'ad hoc' basis to solve specific problems as they arose. Before there were any pressures on tertiary places, each university administered its own admissions procedures. Students would apply for admission to courses in a number of

courses

across different institutions, and select a course from the alternatives offered to them.

This meant that universities would not know how many students they would enrol in

various courses until after all acceptances had been received. By this time it was too

late to top-up the numbers in courses where quota places had not been filled. To

overcome this problem, the tertiary institutions in Queensland established the

Queensland Tertiary Admissions Centre (QTAC) to oversee the application for and offer

of places for all member institutions. Channelling application through QTAC provides a

coordinated approach for universities to fill their quotas and facilitates the placement of

applicants in the highest preference for which they are eligible.

Initially, the TE score

was sufficiently fine-grained to distinguish among students to precisely fill quota

places. As competition for some courses increased, particularly courses whose capacity

to over-enrol was limited by the availability of expensive equipment, a finer measure,

the rescaled aggregates (RAGs), was used to make these finer distinctions among

applicants. The RAGs is the fine-grained scale obtained from scaling students' average

assessment which is used to band students onto the TE scale. Although the stability of

the RAGs scale did not justify their uses in this way, the practice flourished because it

was a cheap, convenient and quick method of allocating students to places, without

any need to refer to other information.

The profile approach proposed by Professor Viviani which will be implemented this year

prevents the use of a single index by denying access by universities to the scales which

underly the new measures. Instead, a range of coarse-grained measures are provided,

each measuring different aspects of student achievement, to be used in different

combinations for selection into different courses. The selection of elements from the

profile to be used for a particular course should reflect the specific

abilities required for successful completion of that course and hence should vary from course to course.

This, it is hoped will remove the anomalous situation which existed in the previous

system where students wishing to gain entry into humanities courses were encouraged

to study Mathematics/Science subjects in the belief that this would increase their TE

score, thus improving their chance of being selected for any course, including those in the humanities area.

Although the profile approach allows universities to 'mix and match' elements to suit

course requirements, a common strategy will apply to the selection procedures for all

courses. This strategy requires that the information be used in the following order:

Minimum levels of achievement in subjects specified as prerequisites (this typically involves Sound Achievement in English, Mathematics and one or two other subjects. However, the requirements of a Sound Achievement is not a difficult hurdle for students otherwise qualified for entry into competitive

courses);

Overall Position (OP) (this places eligible students into 25 bands or ranks based

on their overall achievement at school);

Field Position (FP) (this places eligible students into 10 bands or ranks for each

field. Within each OP Band, students will be selected on the basis of

eligibility/non-eligibility and on the band position in specified fields.

Different

combinations of fields are specified as 'primary' and 'secondary' selectors for

each course. The use of field positions in selection will be used only within a

specific OP band; and

Other relevant information, such as actual levels of achievement in prerequisite

subjects, Core Skills test result, school reports etc.

For some performance-based subjects, auditions and/or student folios are used as a

major selection criterion.

5. CONCLUDING COMMENTS

The stage is now set of the 1992/93 admission process. Universities made and published their decision about how they would select applicants with the new course-grained profile elements. Students were advised of the new procedures in 1990 so they could make decisions, particularly those relating to subjects studied in Years 11 and 12 to optimise their chances of being selected into the course of their first preference.

The universities are now waiting to see if the elements of the new profile will provide sufficient discrimination to fill their quotas. It is understood that some universities have contingency plans, e.g. to over-enrol in some courses while under-enrolling in others so that institutional rather than course targets are met. The outcome will be watched very closely. Snap-shots of the data will be taken at key time, e.g. the day the students receive their Student Education Profile and the day QTAC makes the major round of offers, so that the interaction between the supply and demand for places can be assessed.

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