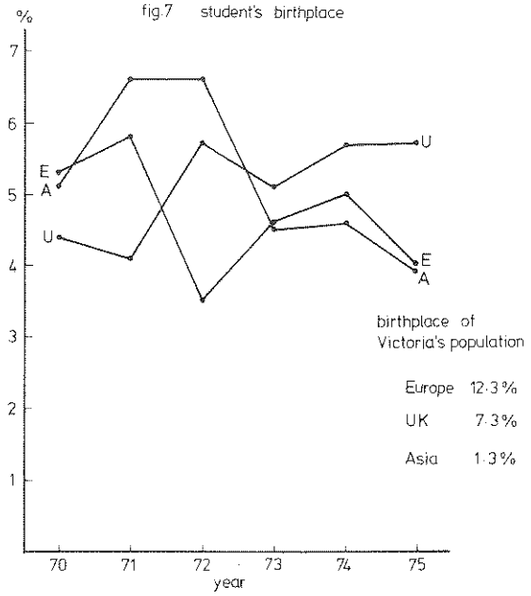
so naturally the percentage of Asian students is higher than the percentage of Asians in the general population. Their numbers are declining, however, but whether this is due to university or government policy, or other factors is not clear.

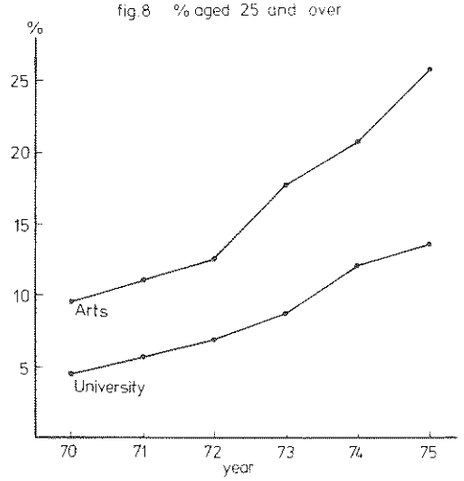
fig.7 student's birthplace



(f) Age

A clear trend from 1970 on is the rise in the percentage of new students aged 25 and over (figure 8). This is not distributed over the whole university but is largely in the Arts faculty. The trend cannot continue at the same rate for much longer, at least in the Arts faculty, and the changing age distribution of new students especially in some other faculties will be interesting to monitor. It will also be important to determine the reasons for attendance of these mature students and their expectations. If mature students are to become a significant component of the student body, their different values, expectations, maturity, etc. will have important implications for future curricula in tertiary education.

fig.8 % aged 25 and over



3. Some Conclusions

These results show that there continues to be considerable incidence of over-representation and under-representation of some groups in the community in the student intake at Monash University. For some groups (in particular females and mature students) there is evidence of a trend towards more equitable representation. On the basis of this data, it would be difficult to attribute these changes to the abolition of fees. The trends existed before the time of fee abolition. This emphasises the need for longitudinal data for this type of analysis. For example if one only had the 1974-1975 data for the increase in mature age students, it would be very easy to make the simplistic causal explanation that the increases are due to fee abolition. In fact, as Figure 8 shows, this trend has existed since 1970.

On the other hand, these results show no evidence of change in participation rates by groups that would be expected to be influenced by fee abolition. For example the children of craftsmen/labourers remain significantly under-represented while the children of professional and executive parents remain significantly over-represented.

A possible explanation for this is that for Monash (and perhaps for tertiary institutions like Monash) biases inherent in the selection procedures are more important barriers to some community groups than financial barriers. If this is so, then if we do wish to widen the tertiary franchise we will need to adjust the selection procedure (for example, along the lines suggested by Fensham (1970)) in addition to the removal of fees. The cost of this in terms of lowering of standards is likely to be negligible (see West and Slamowicz (1976)).

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UNIVERSITY COURSES — FIXED OR ADAPTIVE?

H. Maddox*

The Growth of Higher Education

Of the 1,500,000 people in the 17-22 year age group approximately 10 %, some 150,000, are now enrolled for University undergraduate courses, either full-time or part-time. The demand for University places began to increase strongly in the 1950's. The main causes, in Australia as elsewhere, of this greater public appetite for higher education were the increase in knowledge, especially in scientific knowledge, rising educational standards and rising job qualifications; the high birth rates of the post war years: and above all, increases in family finances which enabled the period of education to be extended. Other factors, peculiar to Australia, have been a high immigration rate and the training of many Asian students.

Australian egalitarianism has insisted that all qualified applicants should have the chance of going to a University if they wish. But in spite of the foundation of new Universities, enrolments expanded to such an extent that quotas had to be introduced in some Universities in 1960. But many Faculties continued to admit all qualified applicants. As a result of this fairly free entry, failure rates in the first year at Universities have always been high, sometimes of the order of 40-50%.

The increase of enrolments has been greatest in Arts-type Faculties, which do not demand a high standard of technical preparation. This imbalance is in line with world trends, and results from the more exacting and laborious requirements in Science and Technology.**

Observers of the tertiary scene have thought that the larger Metropolitan Universities have had to attempt too many tasks, and that they have been able to do few of them well. They train large undergraduate classes (some first year classes are over a thousand strong), and as well as carrying on a tradition of knowledge and scholarship, they give professional training in law, medicine, engineering, technology and business. They also offer part-time degree courses on a unit system to trainees from industry, commerce and the Public Service. They offer postgraduate training and they undertake fundamental research. In addition they serve as cultural centres and forums for discussion. These diverse tasks extend the Universities' resources, and in some localities there is still a dearth of alternative or supporting institutions.

In 1964 the Martin Committee thought that many students attempted University courses who would have been better provided for 'in institutions offering courses of different orientation, and less exacting academically'. The Committee report reiterates that

(a) the general run of pass-degree students are not well catered for in many University departments.
(b) University courses are too abstract and theoretical to meet the day to day demand of industry and commerce.

It does seem to be true that when institutions are upgraded to University status their courses become too difficult for many middling students; and since they tend to be taught by research-oriented Ph.D's., their content can become remote from the every-day world of industry, commerce and agriculture. Therefore their middling students struggle through theoretical courses that they do not fully understand, while their cleverer students aspire to do higher teaching or research themselves, and are often prepared to migrate from their native shores rather than take on the necessary but unexciting jobs which do not meet their intellectual aspirations.

As a result of such considerations, the Commonwealth Advisory Committee on Advanced Education recommended, in 1966, financial support for new tertiary institutions — the Colleges of Advanced Education. And at that time it was the Government's intention that, by 1975, as many tertiary students would be enrolled in the non-University sector as in the Universities. But these intentions have not yet been realised, and C.A. E. enrolments are still only about half of the University enrolments.

Meanwhile, although the size of the 17-22 age group will level out in the coming years, the proportions of students staying on at school to the sixth form is likely to increase. (In N.S.W. the holding power of Government schools in 1973 was estimated at 34% for boys and 30% for girls). And thus the Chairman of the Universities Commission* expects that demand for University places is still likely to increase at between 3-6% per year in the foreseeable future. At the same time, intake is to be pegged at the 1976 level. Universities will therefore be forced, yet again, to be more selective in their admissions, — although now the C.A.E.'s will provide an acceptable, and perhaps for many a more functional alternative to the University.

Between 1951 and 1961 the minimum time graduation rate for full-time students changed very little —

*Higher Education Research and Services Unit, University of Newcastle.

**Currently there are signs of a swing back to the Sciences in British Universities.

*Professor Peter Karmel reported in the *Australian* 7th July, 1976.

improving slightly from 35% to 37%†. But in that period the percentage of the age group entering Universities (about 5%) changed very little. In this period it may well have been true that entry was so selective that further selection would not have improved the quality of entrants. But it does not follow that now, when 10% of the age group are admitted, that selection would be equally ineffective. There is a well-established relationship between the selectivity of Universities and their graduation rates.

The Efficiency of Selection

The questions that now arise are firstly, if Universities are to become more selective, whether they are likely to have sufficient predictive information about candidates to enable them to do so; and secondly how many students should enter Universities and how many should enter other forms of tertiary education.

The prediction of academic success, according to accepted doctrine, is necessarily actuarial. Of those from a given H.S.C. level a certain percentage will pass and a certain percentage will fail. For example O'Neil gave these results for the Science faculty at Sydney:

Leaving Certificate Marks and First Year Pass Rates (1966)

Aggregate Marks	n	% Pass
460 & above	5	100
440-459	17	100
420-439	19	95
400-419	35	97
380-399	61	90
360-379	64	78
340-359	101	71
320-339	104	54
300-319	30	33
	436	

If those scoring below 340 had not been admitted 134 would have been excluded. Of these 68 would have failed, but 66 would have passed. That is, a more rigid selection averts the entry of failing students only at the cost of exluding a similar number of passing students. At the same time, when the percentage passing from a given H.S.C. class interval falls below 50 %, to exclude those in the class interval at least ensures that the "reject-fails" exceed the "reject-passes" — (although this is perhaps small comfort to the excluded individuals who are capable of passing).

Moreover as increasing proportions of the age group attempt to enter Universities the numbers applying for entry from marginal levels of attainment will increase. The following relationship of H.S.C. and first year performance has recently been observed on one Faculty:

H.S.C.	Pass Rate	
	n	%
700 +	8	100
621-680	39	82
581-620	94	63
520-580	86	34
Below 520	26	4
	225	

This is an extreme and perhaps not typical case since first year performance in the Faculty depends very much on having taken Science and Mathematics subjects at school to 2F level, and none of those scoring below 520 had in fact done so. But it illustrates that some students are admitted to Universities, because places are available, whose failure could have been predicted with almost total certainty. And indeed it appears that Universities, while taking for granted certain levels of preparation, do not always insist on them in their admissions requirements. It seems wrong, both for the individual and for the institution, to admit such poorly qualified students, unless the University is prepared to give them bridging or remedial courses, or to adapt its courses to them.

The Numbers Capable of Passing University Courses

In a democratic society which beleives that all should proceed in education as far as they can go, many aspire to higher levels than they are capable of reaching. Individuals seek to go to the University as a result of school attainments, interests, ambitions and family expectations. Governments on the other hand are more concerned with the need for various kinds of skilled manpower in the economy. Universities themselves judge entrants on their ability to cope with their existing courses. Selection is selection for a 'fixed treatment'. And so far Australian Universities tend to resist any call to adapt their courses to the abilities of entering students. In the U.S.A. on the other hand many University courses are designed to deal with 'variable input competencies', and treatments are adjustable to individual entrants.

In the past the supposed distribution of intelligence was thought to define the proportion of the population having the requisite talent to complete a University course. Since having an IQ of 120 in fact means being around the 90th percentile for measured intelligence, and if only 10% of the age group can be admitted to the University, it might seem to follow that only those above IQ 120 should be admitted to a University. But measured intelligence is no guarantee academic success, and the relationship between IQ and achievement is only moderate. (There will nevertheless be an IQ level below which the individual has no chance of success.)

Attainment marks, such as the H.S.C. aggregate, are more closely related to University performance. Such marks are a joint measure both of aptitude and of willingness to work and study. It is usual to play down the correlation between H.S.C. marks and first year performance, but in Science subjects this can be as high as 0.7, which, given the restricted range of talent and given the different conditions of study at school and University is surprisingly high. Moreover at the lower end of the H.S.C. distribution, in the region in which admissions decisions are made, the relationship is often much stronger than it is over the middle range of H.S.C. marks.

On the basis of results at the University of Sydney, O'Neil suggested that students should not be admitted with an H.S.C. aggregate less than 530, and quoted some empirical evidence for such a cut-off. Now a N.S.W. H.S.C. aggregate of 530 is approximately equivalent to the 75th percentile, that is it delineates the upper 25% of those taking the examination. If we assume that approximately 25% of the age group were taking H.S.C. at the time of this study, then only the top quarter of this selected 25 % — only about 6.3% of the total population would have had an aggregate as high as 530.

If this reasoning is accepted it would suggest that only some 6% of the population are capable of coping with University courses as at present constituted. But the old 'pool of ability' idea has been discredited. Academic performance does not depend on a fixed pool of ability. The genes set some limits to mental ability, no doubt, but performance depends just as much on work and motivation, and also on a good school training and specific preparation in relevant subjects. After reviewing the evidence about the distribution of ability, Vernon* concluded that perhaps 15% of the population had the requisite intellectual ability to tackle a University course. But that the limiting factor was more likely to be a lack not of ability, but of sufficient purpose, drive and persistence to stay the course. And before concluding that Universities draw on a fixed pool of ability it is as well to remember that there has always been differential entry to the University by sex, social class, school, ethnicity, and urban-rural residence; and that social educational and financial barriers always prevent some able individuals from entering higher education.†

Nevertheless, without subscribing to 'more means worse', as the proportion of age group entering Universities approaches 10%, there are increasing numbers of students who are unable to meet the standards required, because they lack ability, motivation and appropriate training. The onus is then on the Universities to convince these students that they are attempting courses to which they are unsuited.

Many University staff have few qualms about failing students in first year. Given the system of free access, they argue that it is necessary to discourage those who have not the 'potential' to succeed in their course, and that to pass some of the weaker candidates would only postpone the academic problem to later years of the course. Such a 'hard' response is indeed to some extent justified by the high relation between performance in first year and performance in later years.

But it is a response which conficts with many egalitarian beliefs. Lower down the educational ladder, in the schools, progressive educators advocate a more aggressive attack on individual differences in attainment. Many believe that, given time, remedial training and carefully graded and sequenced instruction, most people of ordinary intelligence can reach acceptable levels of knowledge and skill in almost any sphere. In many ways this is a fine credo, but it is not one which is widely observed in universities.

And indeed Universities may be right in their refusal to give supportive treatment to weak students. Given time and effort it would be possible to increase pass rates, and to ensure that almost all students reached acceptable levels of training. But one of the almost forgotten findings of an earlier generation of educationalists is that the more intelligent students are able to make better use of their acquired knowledge than others. The important thing is not what students know, but what they can do with what they know.

"The brighter students can make wider use of their acquisition than duller students. Brightness, indeed, means in a considerable measure sensitivity to the factors or principles which are common to many situations. Not only do the bright students isolate the essential elements in learning more quickly, but they also perceive more acutely the same elements in new settings. Transfer of experience therefore occurs more fully among bright than among dull individuals;

†The 1961 study, Department of Education and Science, Canberra 1971.

*W. M. O'Neil, Selection for the University, University of Sydney News, vol. 3 No. 5 April 18, 1971.

*P. E. Vernon, The Pool of Ability, Sociological Review Monograph No. 7, Keele 45-57.

†As long as financial obstacles to University entrance remain, the effect of lowering entrance standards is to admit numbers of poorly qualified candidates from the more affluent families. It is in fact cynically suggested that there is a 'social class succession' in higher education: that the expansion of educational facilities results first in a large increase in middle class representation, and that it is not until middle-class needs have been met that places become available to the abler students from other sections who are, financially and educationally, relatively disadvantaged. It is certainly true that more middle-class students apply for entrance at borderline levels of attainment. (Maddox, H. Students entering Applied Science in C.A.E.'s. Australian National University, Canberra 1970 p. 248.)

it is in considerable degree determined by intelligence".*

The general truth of this statement has never been disproven, although the notion of general intelligence has been somewhat eroded. It suggests that the less intelligent undergraduates, although they may be able to achieve pass marks, may often be unable to make use of the abstract and theoretical formulations of many senior undergraduate courses. When senior undergraduates are interviewed, perhaps a third of them say that they do not fully understand their courses. They attend lectures which they seldom or never understand. They cannot see the point of theoretical courses, cannot see their vocational applications, and doubt that they will ever need them in their future careers. With these attitudes and with these difficulties in understanding, the chances of intelligent application are small.

Difficulty Levels of University Courses

If courses are too abstract and difficult for substantial minorities, then there are a number of possibilities of action:

(1) Universities should be more selective in their admissions.
(2) The more difficult and theoretical courses should be made less exacting.
(3) More time and more intensive teaching should be devoted to the more difficult courses.
(4) The more difficult courses should be made optional or should be reserved for the postgraduate years.

All these possibilities except the first run counter to traditional thinking: they involve adapting courses to students, rather than selecting students who can meet the demands of a fixed course.

The first possibility might well be appropriate in a research-oriented department, situated in an area in which less exacting courses were available in C.A.E.'s.

The second tends to meet with opposition from academic staff since it suggests lowering standards. But sometimes subjects are being taught in an unnecessarily abstract and rigorous way.

The third would be appropriate when the difficult course is deemed essential. This tactic is reported to be surprisingly effective. In the Keller Plan, for example, and in other modular learning systems in which 100% mastery of each segment is required, it is claimed that students get a better grasp of fundamental principles than in conventional courses.

*E. L. Thorndike and A. I. Gates. Elementary Principles of Education. N.Y. Macmillan 1929.

The fourth may be prudent in some branches of knowledge, which have been subjected to abstract and mathematical treatments, which are exceptionally difficult, or only tenuously related to practice.

To some extent all instruction must be adapted to students. An advertised syllabus may not be fully covered, certain parts of syllabus which have not been properly understood may not be included in the examinations, the pass standard may be lenient. (In the other direction, a lecturer may extend a syllabus, set questions which have not been covered, and mark examination papers severely.)

In a more general way progress through degrees can be regulated by systems of assessment, and by the amount of choice allowed in selecting courses as constituents of a degree. Pass-rates are increased by having term or end-of-topic rather than end-of-year examinations; by progressive assessment rather than by formal examintion; by allowing compensation when subtopic marks are combined (versus insisting on a pass in each subtopic); by allowing deferred or supplementary examinations: and by allowing 'standing' in parts of a subject, versus insisting on total subject repetition if a part is failed.

These arrangements clearly facilitate progress through a degree. Their effect on levels of attainment is debatable. Fewer students fail under progressive assessment, for example, than under end-of-year examinations. But progressive assessment tends to make students work more regularly, as well as removing the difficulties associated with a 'grand final'. Hence improved pass rates may reflect a more regular pattern of work and a genuine rise in attainment.

There is evidence that, in going over to a greater variety of assessment methods, Universities are reaching a kind of pragmatic adjustment to the capabilities of their students. The process seems to have gone furtherest in non-professional Faculties. In these Faculties pass rates have tended to improve in recent years. But there is little sign of improvement in many technical and professional Faculties, where the progress of students towards the degree is still depressingly slow.

*A related possibility is to reduce workload. In some applied science Faculties the average workload of full-time students exceeds 50 hours a week. As workloads increase they can be handled only by decreasing numbers of the more able students.

FAILURE AND WITHDRAWAL: STUDENT DROPOUT AT FLINDERS UNIVERSITY

Peter Sheldrake*

Student 'Wastage' is a somewhat provocative term, especially when it is related to the estimated cost of students' failure to complete courses (cf. Selby Smith, 1975). Among the factors that may contribute to the dropout rate among students — that is, to the proportion of students that fail to complete their degree or diploma studies — are failure, withdrawal because the student no longer feels able to complete the course, withdrawal because the student fears failure, withdrawal for a number of non-academic reasons (including financial or family matters, health, or moving to another district), and even withdrawal to study elsewhere. It is easy in a context where a relatively unselective entry to universities operates to equate dropout with failure, but to do so masks a far more complex reality.

In order to establish some of the factors that appear to contribute to university dropout, a small retrospective study was made of students who left Flinders University without completing their degree course. This study was based on a scrutiny of the records of a 25% sample of all students who left the university in the period 1966-1975. The data suggest an overall figure of around 46% as the dropout or 'wastage' rate for the first ten years, compared to the range of 31-42% quoted by Selby Smith (1975): however, it is clear that this figure reflects a high dropout in the first few years, as the current rate seems to be established in the region of 30-35%: included in these are several University of Adelaide medical students coming to Flinders for one year only. Overall figures are given in Table 1.

In the light of the expectation that most dropout is a screening or selection mechanism, Table 1 shows half of those who dropped out left either because they had failed courses (155 - 27.8%), or because they thought it likely they could do so (124 - 22.3%). In other words, approximately half of the dropouts apparently withdrew for 'other reasons'. Further, while the proportion fo students withdrawing for 'academic' reasons (i.e. failure, or likelihood of failure) has varied from year to year, overall there is a clear tendency for academic 'failure' to be a most likely reason for non- completion in the earlier years of the university, and for those withdrawing for 'other reasons' become a more appreciable group in more recent years. This is the more striking since the proportion of withdrawals appears to have decreased in recent years: in other words, there has been a significant decrease in the likelihood of academic failure being the reason for students to dropout.

The changing pattern and incidence of withdrawal suggests a number of possible contributing factors

Table 1

Dropout Rates 1966-1973 Entrants

	Overall Dropout Rate	Withdrawal through failure	Withdrawal through likelihood of failure	Withdrawal for other reasons
1966	42	13	8	21
1967	47	17	13	16
1968	47	15	16	16
1969	50	15	13	22
1970	38	10	15	13
1971	37	9	6	21
1972	33	8	7	18
1973	33	5	3	25
N	547	145	124	278

Figures given as a percentage of total enrolments.