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Pecuniary Implications of the Proposal for Extending the Teacher Education Programme in Universities.

by Ross J. Harrold,
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Introduction

The proposal by Fielding, Cavanagh and Widdowson* is that universities should replace the present four-year pre-service teacher training (both end-on and concurrent) with a four-phase scheme requiring five years for the completion of the three pre-service phases.

The first phase comprises three years' study towards a relevant undergraduate degree. The second is one year's internship in a school, under the tutelage of a 'master teacher'. In the third phase, the student returns to his Alma Mater to complete one year's study of the fundamental aspects of educational knowledge. The trainee becomes a fully certified teacher at the completion of this third phase. The fourth open-ended phase refers to the in-service and continuing education and training of the classroom teacher.

Our particular interest is with the second phase, since this is the most novel aspect of the proposal. If the proposal is to be implemented successfully, it must be acceptable to various parties — the Commonwealth Government as a principal funding agent, the State Governments through their departments of education, the university councils and faculties, and the students themselves. This paper interprets acceptability in terms of the relative magnitudes of the expected financial benefits and costs of the proposed scheme to each of the parties concerned. There are of course other aspects to acceptability besides financial — e.g. political, administrative and organizational. It is left to the reader to weigh up the financial with the various non-financial implications of the scheme, to come to some overall assessment as to whether the scheme should be implemented.

Our purpose therefore is to explicate the major costs and benefits likely to be perceived by the relevant parties and thus to anticipate the enthusiasm they are likely to exhibit towards the scheme. We could find that while the scheme appears to be worthwhile from a social perspective, one party does not find it so, perhaps because the perceived costs of the extended internship scheme are too high. In such a situation, action might be required to reduce these costs in order for the scheme to appear more acceptable to that party. We thus need to appreciate the nature of the costs which are likely to be incurred and their distribution of burden between the various parties involved.

* Fielding, A.I., Cavanagh, D.M. and Widdowson, R.E.(eds.), *Teacher Training: Anti-Climax to Education*, Wollongong: University of Wollongong 1977.

(A shorter version of this was published in AJTE in November, 1978—Ed)

The Nature and Distribution of Internship Costs

Trying to assess what are likely to be the costs of an internship scheme and how the burden of these costs is shared, are complex tasks. Let us make two preliminary points.

Firstly, we can view the proposed scheme as essentially to extend the length of a student teacher's practicum by 160 days i.e. from the present required 40 days to 200 days. Nevertheless, the scheme effectively increases the student's whole teacher education course by a full academic year. The final year, without any practicum, is effectively extended by 40 lecture days.

Secondly, we assume that before the school year commences, interns are given a residential induction course to provide an introduction to school organization and principles of teaching. This will involve the university in outlays on additional lecturing duties and interns on accommodation and materials.

Table 1 attempts to summarize the nature and distribution of the costs incurred by a student teacher's involvement in the proposed internship scheme. The format of the table distinguishes between that entity which makes payments and that which actually bears the burden or sacrifice. The distinction lies partly in the funding arrangements for education in Australia. For example, to the extent that the Commonwealth is willing to incorporate the internship program in its funding formulae, the payments made initially by the university, ultimately are translated into a cost burden on the Commonwealth Government.

The table distinguishes between payments made to purchase specific services (actual outlays) and *pro rata* payments made to those who provide services to the internee as part of their employment. (—called imputed outlays).

The table postulates that there is a further cost involved. Under the internship scheme the student is introduced gradually to the teaching situation, probably spending a good deal of his time in remedial work with small groups of children. At a maximum, he is expected to undertake a half class contact load. Yet as a graduate, he already has done as much tertiary preparation for teaching as those who gain a certificate or diploma of teaching from a College of Advanced Education. An alternative version of the internship scheme could be that the intern be considered as a full classroom teacher⁽¹⁾, under the supervision of a master teacher, and be paid at the 'first step' salary of a two-year trained assistant viz \$8,800. Of this, some \$1,600 would be paid in Commonwealth income tax, leaving him with \$7,200. This income forgone by the intern is largely offset, however, by the scholarship payment to the intern of half the 'first step' salary of a four year trained assistant teacher viz \$4,870. In other words the State Government shares some of the cost burden of the intern being held back from full remunerative

(1) In England, till recently, university graduates could become 'direct entry' teachers, without preservice training. This service (valued at that of a teacher's aide) is considered an offset to the State's scholarship payment.

TABLE 1
Nature and Distribution of Costs of Internship Programme
(January 1978 prices)

	Outlay made by—			Cost burdens borne by—			
	University	Ed. Dept.	Student	Total Outlays	Commonwealth	State	Family
	\$	\$	\$	\$	\$	\$	\$
(i) <i>Actual Outlays</i>							
Master teacher (a)	907			907	907		
Induction course (b)	100		100	200	100	100	
Course related outlays (c)			100	100		100	
	1007		200	1207	1007	200	
(ii) <i>Imputed Outlays</i>							
Reduced load for master teacher (d)		700		700		700	
Principal's responsibilities		50		50		50	
University liaison	110			110	110		
	110	750		860	110	750	
(iii) <i>Lost Income</i>							
Income forgone (e)		4870		4870	1600	4870	2330
Less services rendered (f)			4870			-2520	
							6280
TOTALS	1117	5620	200	6937	2717	3100	2530
							8347

employment. In return for his scholarship allowance, however, the intern does provide some teaching service to his school—albeit in a subsidiary capacity.

The most noticeable feature of the table is that there are considerable differences between the accounted outlays and the economic costs, or sacrifices, of the scheme. The sacrifices required to be made are neither equal to, nor borne by those who make the actual outlays. For example the Commonwealth government is shown to bear the cost burden of the University programme. Moreover the costs exceed the additional grants it makes through the Universities Council, by an amount equal to lost income tax revenue from a full-time teacher.⁽²⁾

Likewise the student and his family make sacrifices of uncompensated lost earnings, which are nearly twelve times the private course outlays. On the other hand, the cost burden on the State Government is shown to be considerably less than the education department's actual and imputed outlays on the intern, because of the offsetting teaching services given by him.

Cost burdens are more relevant than actual outlays in affecting the likely acceptability of the proposed scheme to the various parties concerned. If a body is confident that all or most of the payments incurred by a decision will be reimbursed by another, cost considerations are unlikely to weigh heavily in the making of that decision.

(2) Note that the payment of a teacher's salary is made by the State government while income taxation is received by the Commonwealth Government.

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- (a) Master teacher assumed to be paid at full daily rate for professional assistance for 160 days at the daily rate of \$5.67 (unsupervised practice, reports not required, for a two-methods student).
 - (b) Induction course outlays assumed made by university of lecturers and by students on accommodation and related expenses.
 - (c) Course related outlays refer to required fees, transport and requisites for teaching preparation.
 - (d) Fielding *et al* propose that the master teacher be given a time allowance to counsel his intern. The assumed cost is based on one period per week allowed to a master teacher who is also a subject master.
 - (e) Assumed that the worth of the teaching services of an untrained graduate, teaching his own classes, would be of equivalent worth to a two year trained teacher in first year of teaching. viz. \$8,800. Of this, personal disposable income would be approximately \$7,200, since \$1,600 would be required in income tax. This disposable income forgone is assumed to be offset by the Education Department paying a scholarship to the student of \$4,870—half the salary of a four year trained teacher in his first year of teaching. The \$2,330 represents the net income forgone of the student.
 - (f) The intern can be expected to give some teaching services, most of these presumably providing assistance to the master and other teachers. These services are given an assumed value equivalent to a half-time teacher aide (\$2,520).

Conversely, if a body knows that a decision will entail lost opportunities of considerably greater value than the outlays it incurs, then it is likely to make decisions which differ significantly from what an observer might expect on the basis of actual outlays alone.

We can summarize our analysis of Table 1, therefore, by saying that:

- (i) the total costs of the proposed internship year exceed by about ten percent, the actual outlays of the year, and
- (ii) the cost burdens are borne roughly evenly between the Commonwealth, State and student's family.

Note that the cost to the State of the whole internship scheme will exceed that of the year, to the extent that in the following year it will pay a higher allowance to the student at university, than is paid at present⁽³⁾

Note also, that if the State Government does not grant the student a scholarship and he has instead to rely on a Tertiary Education Assistance Scheme allowance of \$3,500, the total cost burden on the family would rise by \$1,370 to \$3,900, the Commonwealth's burden would increase to \$4,087, while the State would be in the net benefit of \$1,770.

An Approach to Comparing the Acceptability of Teacher Education Programmes.

Decisions are not made solely on the basis of costs. Even if costs are high, a decision might still be acceptable if the benefits expected to flow from it justify its costs.

There are a great many tangible and intangible educational benefits which Fielding, Cavanagh and Widdowson (1977) claim would flow from their extended teacher education program. Each party will no doubt make its own assessments of their validity, relevance and worth. These assessments must of necessity be subjective, for there is little research evidence which could demonstrate and verify the educational benefits they claim.

We have no desire to challenge the reality or importance of the educational benefits which the authors claim the program could generate. Our purpose is to narrow the field of debate by taking account of the pecuniary benefits to the various parties which could flow from the scheme and by relating them to the costs we have discussed above. We certainly have no wish to imply that the financial aspects of the scheme are in any way more or less important than its educational aspects. Our intention is to 'clear the ground' of debate by demonstrating the possible acceptability or otherwise of the scheme to the parties on solely pecuniary grounds. This aspect can then be considered alongside the sundry other aspects when policy decisions are being made. If, for example, the expected cultural, social and other benefits are very large, but the private financial returns over costs are meagre, there could be a case for government acting to lower the costs and/or raise the financial benefits to the individual, to increase the likelihood that a sufficient number of individuals will support the programme by enrolling in it.

(3) The 1978 Year 4 allowance is \$3,500 against the scheme's proposed \$4,870—an increase of \$1,370.

There is little meaning in studying the five year teacher education programme *in vacuo*, since through the eyes of all parties it will be seen as an alternative to the existing programs, viz the four year degree—diploma program of universities ⁽⁴⁾ and the three year diploma of teaching program at colleges of advanced education. For simplicity, all programs will be viewed as 'packages' which are commenced from the first year of tertiary study. While it could be argued that the end-on diploma of education and post-graduate bachelor of education could be entered at the completion of the first degree, the constraints of teaching subject requirements set by employing authorities mean that in fact the student must make some commitment to an intended teaching career at quite an early stage of his primary degree program.

Our procedure is to take each program in turn and relate the expected additional costs to be incurred, with the expected stream of additional benefits which will result over the working lifetime of the graduate. Since we have postulated that each program is to be taken as a package, the critical time of choice between programs is the time at which a matriculant makes his initial enrolment.

For the purposes of our comparative study of incremental benefits and costs, therefore, we shall consider the case of a bright, ambitious matriculant from a poor family. Without further study he could obtain a job readily but he is seriously considering a teaching career. He knows he would have little trouble in graduating in minimum time. He wants to ensure that he receives reasonably rapid career advancement and its accompanying financial return to justify his sacrifices while training.

There are three teacher training paths from which he can choose:

- (i) five years of university training which will yield a double degree (which includes a post-graduate education degree).
- (ii) four years of university training, which will give him a degree and diploma
- (iii) three years of training at a college of advanced education, which will result in a Diploma of Teaching.

We assume that alternatives (i) and (ii) would lead him into secondary teaching and (iii) into a career in primary school teaching. He has learnt from his career advisory officer the approximate number of years it would take him to reach particular promotional positions if he entered the banking field immediately or gained teacher registration under each of the above three options. In particular, he is advised that since the major criterion for the placement of a graduate teacher on a promotions list is years of service, the additional post-graduate qualification gained from option (i) is unlikely to advance his prospects of early promotion by any more than one year, compared with his possessing a degree—diploma qualification.

He knows that if he chooses option (i) he will receive a TEAS living-at-home allowance while he studies for his undergraduate degree, then for the intern year and for the final year of university study, he will receive half the first year

(4) From the point of view of pecuniary costs and benefits, it is immaterial whether the diploma is obtained as a concurrent or an end-on qualification.

teacher's salary. If he chooses either option (ii) or (iii) he expects to receive a teacher education living-at-home scholarship for the duration of the programme.

We shall consider this case from two decisional frames of reference—from the student's own perspective, in order to assess the relative attractiveness of each option to him and his family, and from the societal perspective, in order to consider the extent to which each appears to justify the commitment of society's resources. Societal costs and benefits include those borne and received by the student and the rest of society—the latter being represented by the Commonwealth and State Governments. On the (heroic) assumption that salary payments reflect with some accuracy the worker's social contribution (i.e. that the worker is 'paid what he's worth') we take annual gross earning of a teacher to truly reflect the social value of his teaching services in that year.

Likewise we take as social cost of a full-time student's study, the gross earnings he could have earned if he was in full-time remuneration work, commensurate with his current educational achievements.

The private individual is untroubled by any assumed connection between his earnings and his social contribution—he is concerned with how much is, or could be, in his own pay packet. From a private viewpoint, therefore, we consider the person's potential or actual income after the deduction of income taxation.

With any evaluation of future educational alternatives the problem of differing time streams of costs and benefits must be faced. The costs of our options are borne over three, four or five years. The benefits are assumed to begin in the fourth, fifth or sixth year and to extend to the forty sixth year, assuming the teacher works until age sixty-five. Before we can compare an expected cost in say 1980 AD with an expected benefit in 2025 AD, we must bring both to the common time base of the present. (We therefore call these 'present values'). This we do by the method of time discounting—which is essentially an inverted form of compound interest. There is no 'right' rate of time discounting which should be used. The rate considered by the decisionmaker to be appropriate depends on two main factors—(a) the uncertainties that future events will occur and (b) the 'time preference' of the decisionmaker i.e. the different importance a person gives to a particular cost or benefit occurring in the immediate, compared with the more distant, future.

Because society can 'spread its risks' more easily than can individuals, (a) is a less important consideration from a social than from a private perspective. Thus social discount rates are generally lower than private rates. But since the analyst has no prior right to state what the 'proper' social or private rate of time discount should be, benefit-cost estimates are usually made using a range of rates, enabling the decisionmaker to pay most attention to those estimates calculated using what he believes to be the most appropriate rate. In the analysis below we have presented social benefit-cost ratios using discount rates from one to eight percent, and private ratios using rate of three, six, nine and twelve percent.

There is one final point in this introduction to the benefit-cost analysis, concerning the 'baseline' used for the calculation of the ratios. In our case study, the prior choice facing the matriculant is whether or not he should undertake any tertiary study at all. He already possesses educational qualifications equal to most young people of his age. If employment opportunities exist he could find work immediately. From his private perspective while further study promises higher earnings after completion of his teacher training, the training itself will incur considerable sacrifices of forgone earnings and financial outlays. Will the present values of these future additional (incremental) earnings exceed the present values of the expected extra (incremental) costs of each study option? Similarly, from the social perspective: while the worker's productivity is likely to be enhanced by tertiary education, considerable production potential will be lost by the person not being in productive work during his training. Will the present value of the worker's additional productivity over his working life exceed the present value of production forgone, allowances given, and additional educational resources absorbed during each of the teacher training programme options? To answer both sets of questions, we compare the cost and subsequent earnings profiles expected from each of the programme options, with an estimate of the possible lifetime earnings profile of the matriculant if he entered the workforce directly from school.

Private Benefit—Cost Ratios of Teacher Education Options

Appendices 1-3 show the detailed benefit-cost calculations of each of the three options (i), (ii) and (iii) introduced earlier. Each seeks to represent the probable events in every year of the matriculant's subsequent career, then to compare his net (after tax) salary for that year (columns 1-3)⁽⁵⁾ with his net wage if he had undertaken no further study (columns 4-6)⁽⁶⁾.

Column 7 shows the difference between these two income streams for each year. The negative incomes (earnings forgone) during the teacher preparation years represent the costs of each option; the positive incomes after appointment as a teacher represent the option's benefits. Before the age-specific negative or positive incomes are aggregated each is discounted to derive a net present value, (in these appendices a discount rate of 12% is used) the benefit-cost ratio is simply the ratio of the aggregate of the net present values of the positive incomes (the benefits) to the aggregate of the net present values of the negative incomes (the costs).

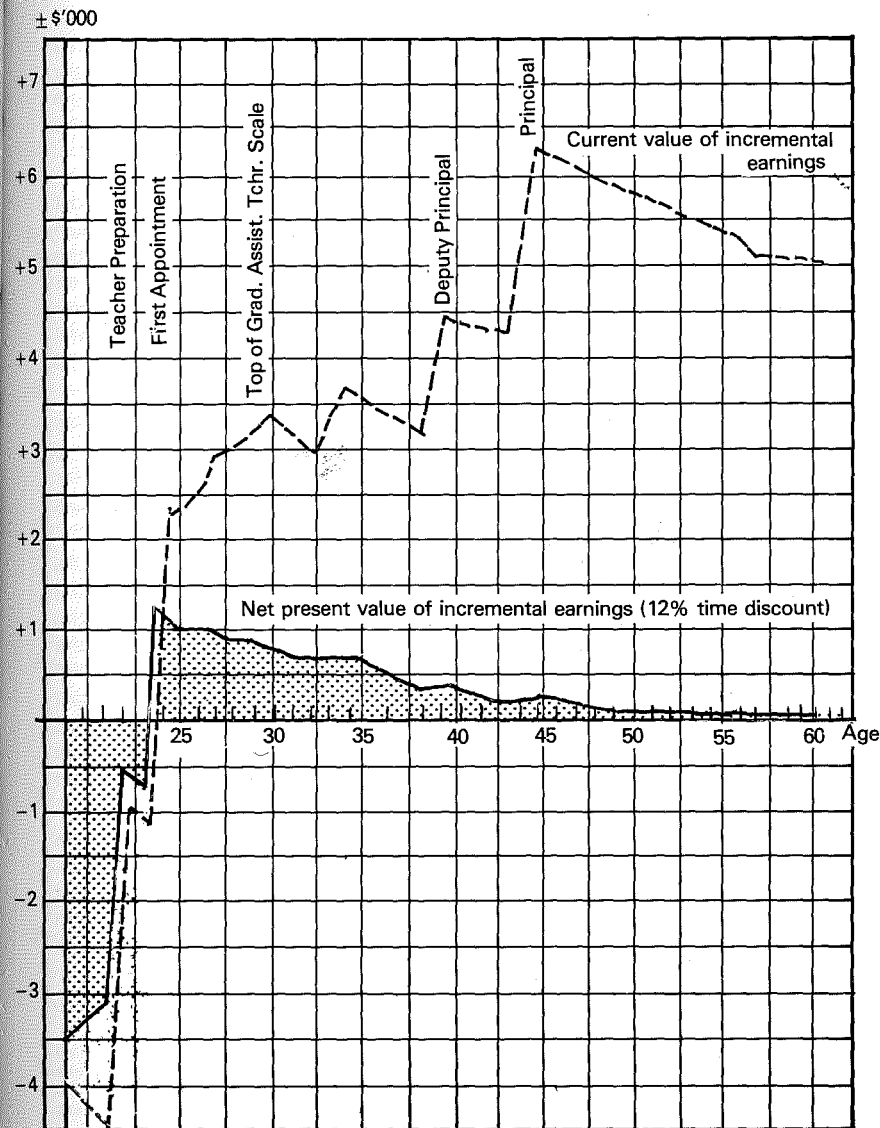
Before we present the final benefit-cost ratios for each option using various discount rates, it might help clarify the exercise if the mathematical results of

(5) During teacher training, column 1 data represent the value of the student's teacher education scholarship for options (i) and (iii) and years 4 and 5 of option (ii) or the value of a TEAS allowance for years 1-3 of option (ii). Column 2 represents his course-related outlays estimated from Commonwealth Department of Education *Income & Expenditure Patterns of Australian Tertiary Students in 1974* Research Report No. 1 Table 36, updated to 1977 prices using the C.P.I.

(6) Estimated age-specific gross earnings of the matriculant are the mean earnings of full-year full-time workers with matriculation but with no post-school qualifications, reported in Australian Bureau of Statistics *Income Distribution 1973-4* (Ref. 17,18) updated by use of index of award wages, to Nov. 1977.

GRAPH 1

Net Present and Current Incremental Earnings Expected from
a Five Year Teacher Education Program (Option 1)
(12 percent time discount rate)



Source: Appendix 1

these appendices are shown in graphical form. The horizontal line of Graph 1 represents the 'baseline' earnings profile of the matriculant worker. The negative incomes below the baseline represent the costs and the positive incomes above the baseline represent the benefits of each of the three options.

The most striking feature of the graph is the extent to which time discounting diminishes the present values of earnings expected to be received in the more distant future. Although a principal's age-specific salary is very much larger than that of the matriculant worker, the time at which the principal's position is expected to be reached is so far into the future, that the differential makes a quite modest contribution to aggregate benefits.

Table 2 and its accompanying Graph 2 present an array of benefit-cost ratios from the perspective of the individual. Comparisons are made between ratios appropriate to a selected time discount rate. As mentioned earlier, the individual who pays most attention to his incomes and outgoes in the shorter term future would compare the ratios calculated with a higher discount rate: the person who takes a longer term view and considers his incremental earnings later in his career almost as highly as those in his early career would pay most attention to the ratios which use a low discount rate.

The higher the discount rate, the lower the benefit-cost ratios because (as Graph 2 shows) of the smaller benefits from incremental earnings in the more distant future. Nevertheless, all three options are acceptable investments for the individual at even the high rates of discount, since benefits exceed costs ($B/C > 1$).

More significant for our purposes is the comparison between options. As the double degree program (Option 1) has the lowest benefit-cost ratio of the three programmes for every time discount rate.⁽⁷⁾ This suggests that under the proposed conditions of student allowances and promotional criteria, the proposed teacher education programme which includes a one year internship will be less attractive than either of the two present programmes, to a bright matriculant who pays attention to the effects of his programme of studies on his later career earnings. It should be recognized that although the relative ratios diverge somewhat at higher discount rates, the difference between them is never very great.

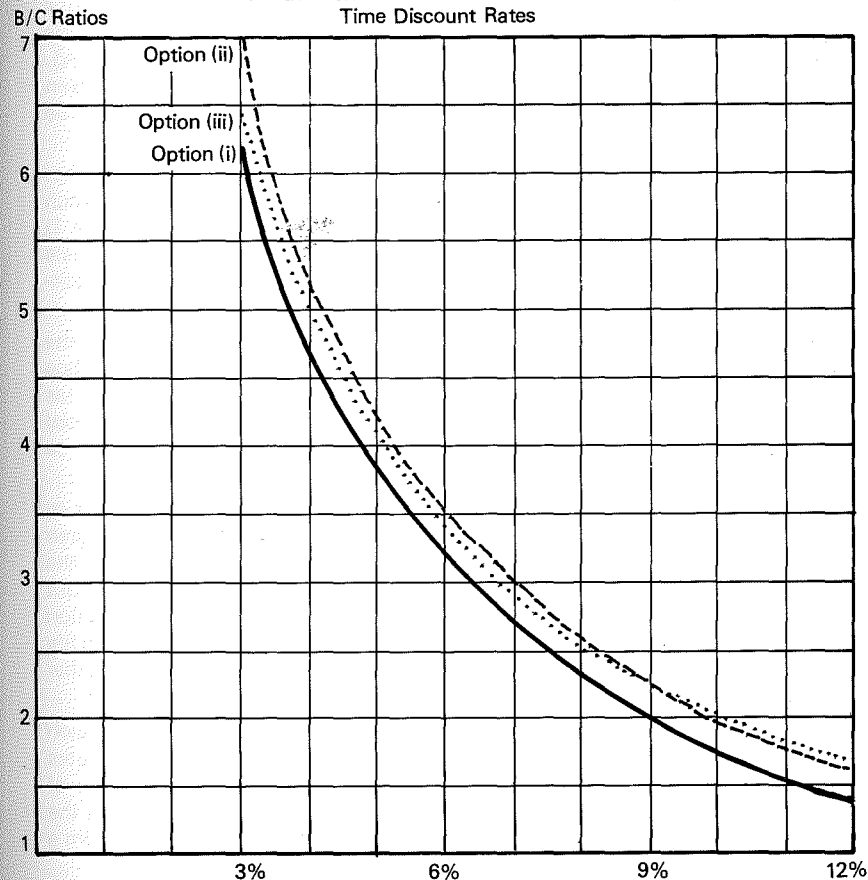
We can say, therefore, that even if the matriculant is aware of, and pays heed to results such as these, he is unlikely to let them outweigh other non-pecuniary implications of choosing one or other of the options. Put differently, other non-pecuniary benefits which the student expects to obtain from choosing to take option 1 might offset its relatively adverse benefit-cost ratio, to make it the most desirable option of the three.

(7) While it is not central to our current exercise, a comparison of options (ii) and (iii) is interesting. While the career opportunities of a secondary teacher with a degree and diploma of education are greater than those of a primary teacher with a three year Diploma of Education, the costs of the former are higher, thus a career-oriented matriculant (with a low discount rate) is likely to find the longer tertiary programme preferable. Someone who has a shorter time horizon would find no basis for deciding between these programmes on pecuniary grounds.

TABLE 2
Private Benefit-Cost Ratios for Alternative
Teacher Education Options

Option	Program	Time Discount Rate			
		3 percent	6 percent	9 percent	12 percent
(i)	Five year double degree	6.15	3.38	2.07	1.38
(ii)	Four year degree-dip.ed.	6.97	3.87	2.40	1.63
(iii)	Three year diploma	6.53	3.72	2.38	1.67

GRAPH 2
Private Benefit-Cost Ratios at Different
Time Discount Rates



Source: Table 2

Social Benefit-Cost Ratios

The main difference between the basis of social and the private benefit-cost calculations is that the former takes a production rather than an income orientation. That is, the society is not so interested in how much a worker might receive, as the value of what he might contribute to society. In public service activities such as education, it is extremely difficult to obtain an unambiguous estimate of the value of the social contribution of a worker's services. As we mentioned earlier the best approximate value of this contribution is the gross salary the government employing authority is prepared to pay the worker.⁽⁸⁾ By this reasoning, the income tax paid from gross salary is irrelevant, for it affects only the distribution of the fruits of the worker's production: the higher the proportion of salary paid in taxation, the greater the share of the fruits of the worker's production which others ('the society') receive. From the same social perspective, the costs of a student's full-time study are taken to be the actual and imputed outlays of the educational institution, plus the gross earnings forgone by his not working. The magnitude of any student allowance is irrelevant, for the same reason that income tax payment is irrelevant—it affects only the distribution of the social cost.

Appendix 4 details the estimated annual social costs of each of the teacher education options. The stream of social benefits expected to flow from each option is taken to be the difference between gross teacher salary (column 1) and gross matriculant wage (column 4) in the relevant appendix. Both costs and benefits are discounted at 1, 2, 4 and 6 percent, to yield the social benefit-cost ratios reported below in Table 2.

As expected, the social benefit-cost ratios of all options are less than the private ratios for any given discount rate. Nevertheless, all benefit-cost ratios still exceed unity: that is, the present value of the stream of social benefits (as measured by incremental gross earnings) still exceed the discounted social costs of the teacher education programmes. This suggests that all three options are worthwhile social investments, despite their costs.

The relative social benefit-cost ratios at each discount rate are similar to those found for the private benefit-cost ratios. The five-year double-degree teacher education programme consistently has less favourable ratios than the other options for all time discount rates considered. The higher the discount rate the slightly more favourable is the ratio of option (i) compared with option (ii). This is because the higher gross earnings later in the teacher's working life become more heavily discounted than the higher costs of the five-year teacher education programme.

Particularly significant is the fact that there is a difference in the dispersion between the social and the private benefit-cost ratios. Table 4 demonstrates that at the low three percent discount rate the private benefit-cost ratio of option (i) is 6-13 percent less than those of the other options, whereas the social ratio of option (i) is 26-34% less than those of the others. Thus from a

(8) Age-specific salaries are primarily the result of industrial agreements in which seniority rather than merit or productivity is the major determinant.

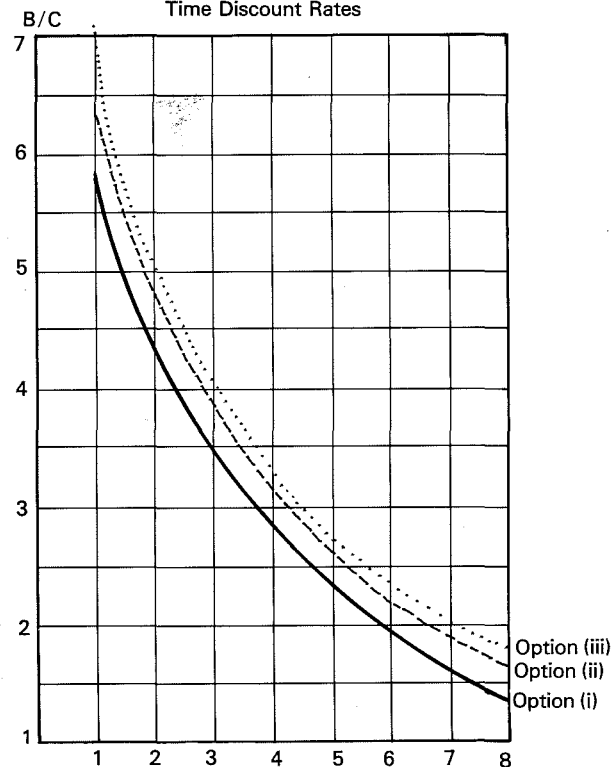
social viewpoint this analysis suggests it will be difficult to argue the case that educational and other non-financial benefits which the internship scheme claims to generate, will be large enough to offset these adverse benefit-cost ratios and to justify the programme's implementation.

TABLE 3
Social Benefit-Cost Ratios for
Alternative Teacher Education Options

Options	Programme	Time discount rates (percent)							
		1	2	3	4	5	6	7	8
(i)	Five year double degree	5.41	4.26	3.41	2.76	2.21	1.84	1.55	1.32
(ii)	Four year degree + dip. ed.	6.86	5.40	4.31	3.49	2.70	2.27	1.93	1.66
(iii)	Three year diploma	7.26	5.71	4.57	3.72	3.07	2.57	2.18	1.88

Sources: Appendices 1-4

GRAPH 3
Social Benefit—Cost Ratios at Different
Time Discount Rates



Source: Table 3

TABLE 4
A Comparison of Benefit-Cost Ratios at
Three Percent Discount Rate

	Option (i)	Option (ii)	Option (iii)
Private			
Benefit-cost ratios	6.15	6.97	6.53
Index (Option (i) = 100)	100	113.3	106.2
Social			
Benefit-cost ratios	3.41	4.31	4.57
Index (Option (i) = 100)	100	126.4	134.0

Sources: Tables 2 and 3

APPENDIX 4
Social Costs of Teacher Education Options

Option	Year	Outlays		Production Forgone	
		Institutional ^(a)	Private ^(b)	(c)	Total
		\$	\$	\$	\$
(i)	1	2340	193	4330	6,863
	2	2340	193	4600	7,133
	3	2340	193	4960	7,493
	4	1117	200	8800	10,117
	5	2340	193	9870	12,403
(ii)	1	2340	193	4330	6,863
	2	2340	193	4600	7,133
	3	2340	193	4960	7,493
	4	2486	193	8800	11,479
(iii)	1	2892	212	4330	7,434
	2	2967	212	4600	7,779
	3	2967	212	4960	8,139

NOTES:

(a) Estimates of institutional outlays on undergraduate and post-graduate education study are derived from the 'best estimate' of university teaching costs in arts and education respectively.

Selby Smith, C. *The Costs of Post-Secondary Education*, Melbourne: Macmillan, 1975 Fig 3.5 p.22. The 1969 data has been inflated to January prices (1978) using the Universities Commission general salaries index (to December 1976) then the increase in the weighted average salary of graduate certified assistant teachers in N.S.W. (to Jan. 1978). The estimate is that tertiary educational prices at the latter date were 2.54 times the 1969 prices. Outlays for Year 4, option (ii) include professional assistance payments of \$340. Details of Year 4 option (i) outlays are shown

in Table 1. Institutional outlays for C.A.E.'s use Selby Smith's best estimate of the financial outlays per student in education courses at C.A.E.'s in 1969 (*ibid.* p. 31) updated to January 1978 prices. To this is added a professional assistance fee for students practical work in schools.

(b) Private outlays are estimated from the median expenditure on course-related items by education students at universities and C.A.E.'s in 1974 (Commonwealth Department of Education *Income and Expenditure Patterns of Australian Tertiary Students in 1974* Canberra: A.G.P.S., 1975, Table 36 p. 38) inflated to January 1978 prices by the change over the period in the consumer price index (January 1978 C.P.I. = 153 on base 1974 = 100). Year 4 option (i) private outlay obtained from Table 1.

(c) Production forgone assumes that undergraduate students lose 40 weeks' work at an annual (48 week) gross wage equal to the matriculant worker. Degree-holders not in the workforce are assumed to forgo production valued at the annual salary of a two-year trained assistant teacher.

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Note: During tertiary education (years 1-5 incl) 'Gross salary' refers to living allowances and 'Tax' refers to course-related outlays.

APPENDIX 1

Net Present Values of Incremental Incomes for Teachers with Stipulated Tertiary Education above Wages of Matriculant Leavers

Form of Teacher Preparation—Five year double degree
Division of Teaching—Secondary

Age	Events Years (best estimate of sub- from sequent career) matri- cula- tion	Teacher Salary			Matriculant's Wage			Diff	12% Disc. Fac	NPV of Diff
		Gross	Tax	Net	Gross	Tax	Net			
		1	2	3	4	5	6	7	8	9
				1-2			4-5	3-6		7x8
18	19	950	170	780	5200	490	4,710	-3930	.8929	-3509
	20	950	170	780	5,530	550	4,980	-4200	.7972	-3348
	21	950	170	780	5,450	720	5,230	-4450	.7118	-3167
	22	4,870	200	4,670	6,370	810	5,568	-890	.6355	-565
	23	4,870	170	4,700	6,750	950	5,800	-1100	.5674	-624
	24	10,416	2,160	8,316	7,140	1,070	6,076	-2246	.5066	-1737
	25									
	26	11,089	1,800	9,289	7,530	600	6,930	-2359	.4523	-1067
	27	11,714	2,000	9,764	7,880	710	7,770	-2594	.4039	-1047
	28	12,439	2,200	10,239	8,240	850	7,390	-2849	.3605	-1027
	29	13,014	2,410	10,604	8,630	1,000	7,630	-2974	.3220	-951
	30	13,587	2,580	11,007	8,960	1,100	7,860	-3147	.2875	-905
	31	14,165	2,760	11,400	9,280	1,200	8,080	-3320	.2567	-852
	32	14,165	2,760	11,400	9,620	1,310	8,310	-3090	.2242	-708
	33	14,165	2,760	11,400	9,800	1,380	8,420	-2980	.2046	-610
	34									
	35	15,647	3,350	12,300	10,030	1,450	8,580	-3720	.1827	-679
	36	15,647	3,350	12,300	10,140	1,460	8,680	-3620	.1631	-590
	37	15,647	3,350	12,300	10,260	1,500	8,760	-3540	.1456	-515
	38	15,647	3,350	12,300	10,380	1,530	8,830	-3470	.1300	-415
	39	15,647	3,350	12,300	10,470	1,600	8,870	-3430	.1161	-348
	40	15,647	3,350	12,300	10,560	1,600	8,949	-3360	.1037	-348
	41	15,647	3,350	12,300	10,680	1,640	9,040	-3260	.0926	-302
	42	17,936	4,300	13,640	10,740	1,660	9,080	-4560	.0820	-377
	43	17,936	4,300	13,640	10,860	1,700	9,160	-4480	.0738	-330
	44	17,936	4,300	13,640	10,930	1,760	9,170	-4470	.0659	-294
	45	17,936	4,300	13,640	10,980	1,770	9,210	-4430	.0588	-260
	46	17,936	4,300	13,640	11,040	1,779	9,250	-4390	.0525	-230
	47	21,331	5,810	15,520	11,070	1,790	9,280	-6240	.0469	-292
	48	21,331	5,810	15,520	11,160	1,800	9,360	-6,160	.0419	-258
	49	21,301	5,810	15,520	11,230	1,810	9,420	-6100	.0374	-228
	50	21,331	5,810	15,520	11,330	1,840	9,490	-6030	.0334	-201
	51	21,331	5,810	15,520	11,360	1,840	9,520	-6000	.0189	-113
	52	21,331	5,810	15,520	11,400	1,850	9,550	-5972	.0169	-111
	53	21,331	5,810	15,520	11,480	1,850	9,630	-5890	.0151	-110
	54	21,331	5,810	15,520	11,600	1,900	9,700	-5820	.0135	-108
	55	21,331	5,810	15,520	11,720	1,920	9,800	-5720	.0120	-107
	56	21,331	5,810	15,520	11,800	1,960	9,840	-5680	.0107	-106
	57	21,331	5,810	15,520	11,910	2,000	9,910	-5610	.0100	-106
	58	21,331	5,810	15,520	12,020	2,060	9,960	-5540	.0085	-105
	59	21,331	5,810	15,520	12,120	2,090	10,030	-5490	.0076	-104
	60	21,331	5,810	15,520	12,350	2,160	10,250	-5270	.0068	-100
	61	21,331	5,810	15,520	12,520	2,220	10,300	-5200	.0061	-99
	62	21,331	5,810	15,520	12,670	2,300	10,370	-5750	.0054	-97
	63	21,337	5,810	15,520	12,790	2,350	10,440	-5080	.0050	-96
	64	21,331	5,810	15,520	13,000	2,400	10,600	-4920	.0045	-93
	65	21,331	5,810	15,520	13,200	2,460	10,740	-4780	.0061	-90
	66	21,331	5,810	15,520	13,500	2,600	10,900	-4620	.0061	-87

Note: During tertiary education (years 1-5 incl) 'Gross salary' refers to living allowances and 'Tax' refers to course-related outlays.

APPENDIX 2
Net Present Values of Incremental Incomes for Teachers with
Stipulated Tertiary Education above Wages of Matriculant Leaver

Form of Teacher Preparation—Four year degree & diploma
 Division of Teaching—Secondary

Age	Events Years (best estimate of sub- from sequent career) matriculation	Teacher Salary			Matriculant's Wage			Diff	12% Disc. Fac	NPV of Diff
		Gross	Tax	Net	Gross	Tax	Net			
		1	2	3 1-2	4	5	6 4-5	7 3-6	8	9 7x8
19	1	900	193	607	5,200	490	4,710	-4104	.8929	-3664
20	2	1,600	193	1,407	5,530	550	4,980	-3573	.7972	-2848
21	3 Tertiary education*	2,420	193	2,227	5,450	720	5,230	-3003	.7118	-2138
22	4	3,500	193	3,307	6,370	810	5,568	-2253	.6355	-1433
23	5 First appointment	9,741	1,900	7,841	6,750	950	5,800	-2041	.5674	-1150
24	6	10,416	2,100	8,316	7,140	1,070	6,076	-2246	.5066	-1137
25	7 Marries (spouse dependent)	11,089	1,800	9,289	7,530	600	6,930	-2359	.4523	-1069
26	8	11,764	2,000	9,764	7,880	710	7,770	-2594	.4039	-1047
27	9	12,439	2,200	10,239	8,240	850	7,390	-2849	.3606	-1027
28	10	13,014	2,410	10,604	8,630	1,000	7,630	-2974	.3220	-957
29	11	13,587	2,580	11,007	8,960	1,100	7,860	-3147	.2875	-904
30	12 Inspected for List 2	14,165	2,760	11,400	9,280	1,200	8,080	-3,320	.2567	-852
31	13 Placed on List 2	14,165	2,760	11,400	9,620	1,310	8,310	-3090	.2242	-708
32	14	14,165	2,760	11,400	9,800	1,380	8,420	-2980	.2046	-610
33	15	14,165	2,760	11,400	10,030	1,450	8,580	-2820	.1827	-515
34	16 Appointed Subject Master	15,647	3,350	12,305	10,140	1,460	8,680	-3620	.1631	-590
35	17	15,647	3,350	12,305	10,260	1,500	8,760	-3540	.1456	-575
36	18	15,647	3,350	12,305	10,380	1,530	8,830	-3740	.1300	-415
37	19	15,647	3,350	12,305	10,470	1,600	8,800	-3430	.1161	-398
38	20 Inspected for List 3	15,647	3,350	12,305	10,560	1,600	8,949	-3360	.1037	-348
39	21 Placed on List 3	15,647	3,350	12,305	10,680	1,640	9,040	-3260	.0926	-302
40	22	15,647	3,350	12,305	10,740	1,660	9,080	-3220	.0820	-266
41	23 Appointed Deputy Principal	17,936	4,300	13,640	10,860	1,700	9,160	-4480	.0738	-330
42	24 Inspected for List 4	17,936	4,300	13,640	10,930	1,760	9,170	-4470	.0659	-294
43	25	17,936	4,300	13,640	10,980	1,770	9,210	-4430	.0588	-260
44	26	17,936	4,300	13,640	11,040	1,779	9,250	-4390	.0525	-230
45	27	17,936	4,300	13,640	11,070	1,790	9,280	-4360	.0469	-204
46	28 Appointed Principal	21,331	5,810	15,520	11,160	1,800	9,360	-6160	.0419	-258
47	29	21,331	5,810	15,520	11,230	1,810	9,420	-6100	.0374	-228
48	30	21,331	5,810	15,520	11,330	1,840	9,490	-6030	.0334	-201
49	31	21,331	5,810	15,520	11,360	1,840	9,520	-6000	.0189	-113
50	32	21,331	5,810	15,520	11,400	1,850	9,550	-5970	.0169	-113
51	33	21,331	5,810	15,520	11,480	1,850	9,630	-5890	.0151	-111
52	34	21,331	5,810	15,520	11,600	1,900	9,700	-5820	.0135	-110
53	35	21,331	5,810	15,520	11,720	1,920	9,800	-5920	.0120	-108
54	36	21,331	5,810	15,520	11,800	1,960	9,840	-5680	.0107	-107
55	37	21,331	5,810	15,520	11,910	2,000	9,910	-5610	.0100	-106
56	38	21,331	5,810	15,520	12,020	2,060	9,960	-5540	.0085	-105
57	39	21,331	5,810	15,520	12,120	2,090	10,030	-4590	.0076	-104
58	40	21,331	5,810	15,520	12,350	2,160	10,250	-5270	.0068	-100
59	41	21,331	5,810	15,520	12,520	2,220	10,300	-5200	.0061	-99
60	42	21,331	5,810	15,520	12,670	2,300	10,370	-5150	.0054	-97
61	43	21,331	5,810	15,520	12,790	2,350	10,440	-5080	.0050	-96
62	44	21,331	5,810	15,520	13,000	2,400	10,600	-4920	.0045	-93
63	45	21,331	5,810	15,520	13,200	2,460	10,740	-4780	.0061	-90
64	46	21,331	5,810	15,520	13,500	2,600	10,900	-4620	.0061	-87

NOTE: During tertiary education 'Gross Salary' refers to living allowances and 'Tax' refers to course-related outlays.

APPENDIX 3 Option (iii)
Net Present Values of Incremental Incomes for Teachers with
Stipulated Tertiary Education above Wages of Matriculant Leavers

Form of Teacher Preparation—Five year double degree
Division of Teaching—Secondary

Age	Events Years (best estimate of sub- sequent career) matriculation	Teacher Salary			Matriculant's Wage			Diff	12% Disc. Fac	NPV of Diff
		Gross	Tax	Net	Gross	Tax	Net			
		1	2	3 1-2	4	5	6 4-5	7 3-6	8	9 7x8
19	1	900	212	688	5,200	490	4,710	-4,022	.8,929	-3,591
20	2 Tertiary education	1,600	212	1,388	5,530	550	4,980	-3,592	.7,972	-2864
21	3	2,420	212	2,208	5,450	720	5,230	-3022	.7118	-2151
22	4 First appointment	9,057	1,660	7,397	6,370	810	5,568	-1840	.6355	-1169
23	5	9,608	1,850	7,758	6,750	950	5,800	-1,960	.5,674	-1,112
24	6	10,159	2,080	8,079	7,140	1,070	6,076	-2010	.5066	-1018
25	7 Marries (spouse dependent)	10,711	1,670	9,041	7,530	600	6,930	-2,110	.4,523	-954
26	8	11,260	1,850	7,758	7,880	710	7,770	-2240	.4039	-904
27	9 Inspected for List 1	11,811	2,020	9,791	8,240	850	7,390	-2400	.3606	-865
28	10 Placed on List 1	12,140	2,110	10,030	8,630	1,000	7,630	-2400	.3220	-772
29	11	12,468	2,220	10,250	8,960	1,100	7,860	-2390	.2875	-687
30	12	12,468	2,220	10,250	9,280	1,200	8,080	-2170	.2567	-557
31	13	12,468	2,220	10,250	9,620	1,310	8,310	-1940	.2242	-445
32	14 Appointed Deputy Master	14,334	2,830	11,500	9,800	1,380	8,420	-3080	.2046	-630
33	15 Inspected for List 2	14,334	2,830	11,500	10,030	1,450	8,580	-2420	.1827	-533
34	16 Placed on List 2	14,334	2,830	11,500	10,140	1,460	8,680	-2820	.1631	-459
35	16	14,334	2,830	11,500	10,260	1,500	8,760	-2740	.1456	-399
36	18	14,334	2,830	11,500	10,380	1,530	8,830	-2670	.1300	-347
37	19	14,334	2,830	11,500	10,470	1,600	8,870	-2630	.1161	-305
38	20	14,334	2,830	11,500	10,560	1,600	8,949	-2560	.1037	-265
39	21	14,334	2,830	11,500	10,680	1,640	9,040	-2460	.0926	-228
40	22 Appointed Principal,	15,904	3,450	12,450	10,740	1,660	9,080	-3370	.0820	-278
41	23 class 2	15,904	3,450	12,450	10,860	1,700	9,160	-3290	.0738	-243
42	24	15,904	3,450	12,450	10,930	1,760	9,170	-3280	.0659	-216
43	25 Inspected for list 4	15,904	3,450	12,450	10,980	1,770	9,210	-3240	.0588	-190
44	26	15,904	3,450	12,450	11,040	1,779	9,250	-3200	.0525	-168
45	27	15,904	3,450	12,450	11,070	1,790	9,280	-3170	.0469	-149
46	28	15,904	3,450	12,450	11,160	1,800	9,360	-3090	.0419	-130
47	29	15,904	3,450	12,450	11,230	1,810	9,420	-3030	.0374	-113
48	30	15,904	3,450	12,450	11,330	1,840	9,490	-2960	.0334	-99
49	31	15,904	3,450	12,450	11,360	1,840	9,520	-2930	.0189	-55
50	32 Principal, class 1	19,364	4,910	14,450	11,400	1,850	9,550	-4900	.0169	-93
51	33	19,364	4,910	14,450	11,480	18,50	9,630	-4820	.0151	-91
52	34	19,364	4,910	14,450	11,160	1,900	9,700	-4750	.0135	-90
53	35	19,364	4,910	14,450	11,720	1,920	9,800	-4650	.0120	-88
54	36	19,364	4,910	14,450	11,800	1,960	9,840	-4540	.0107	-86
55	37	19,364	4,910	14,450	11,910	2,000	9,910	-4490	.0100	-85
56	38	19,364	4,910	14,450	12,020	2,060	9,960	-4420	.0085	-84
57	39	19,364	4,910	14,450	12,120	2,090	10,030	-4200	.0076	-79
58	40	19,364	4,910	14,450	12,350	2,160	10,250	-4150	.0068	-78
59	41	19,364	4,910	14,450	12,520	2,220	10,300	-4080	.0061	-77
60	42	19,364	4,910	14,450	12,670	2,300	10,370	-4010	.0054	-76
61	43	19,364	4,910	14,450	12,790	2,350	10,440	-3850	.0050	-73
62	44	19,364	4,910	14,450	13,000	2,400	10,600	-3710	.0045	-70
63	45	19,364	4,910	14,450	13,200	2,460	10,740	-3700	.0061	-69
64	46	19,364	4,910	14,450	13,500	2,600	10,900	-3550	.0061	-67