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ABSTRACT

This paper examines the issue of the responsibility of higher education institutions (HEIs) for and response to rising unemployment rates and economic decline within Australian society. It presents an analysis of the salary and employment status of college graduates over time, revealing that types of graduates with initially high levels of unemployment do eventually get absorbed into the workforce. Additionally, the paper examines reports from various countries in the Organization for Economic Cooperation Development on the relation of unemployment to graduates of the humanities and social sciences - the implication being that problems of employment were greatest for such graduates. Other topics discussed include: (1) changes in student distribution and enrollment in various fields of study and the responsibility of HEIs to respond to changes in educational demand; (2) the nature of technology and its relation to higher education and employment; (3) the issue of HEIs' ability to predict employers' demands for a great range of changing skills and to supply that demand with qualified graduates; and (4) HEIs' role in displacing labor through its research and development contributions to technological change. (GLR)

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Higher education and employment

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This paper was first presented to a seminar at the Centre for Study of Higher Education, University of Melbourne, 25 August 1993.

When their economies are in a depressed state, as most of the OECD economies have been for some time, governments and employers become much more critical of higher education institutions (HEIs). Why are their graduates not more vocationally oriented and employable? Why do they not produce more laplacian, creative and entrepreneurial graduates? Why is there not more technology transfer from university research? Doubtless it comforts them to have scapegoats, and HEIs are now very large and significant targets. The percentage of a generation enrolling in higher education is now over one-third in two-thirds of the OECD countries, and over one-half in one quarter of them. It follows that the skills and attitudes of a considerable proportion of new entrants in the labour market have been influenced, in greater or lesser degree, by exposure to higher education.

Particularly since the decline in the growth rates of most national economies since the mid-seventies, dissatisfaction with the performance of HEIs has led governments to make institutional changes, and to put pressure on established institutions to make other changes. In Australia the Dawkins changes were designed to make HEIs more effective in generating economic growth and competitiveness in international trade. Important parts of that policy were the pressures on universities to become less dependent on government grants - by, for example, recruiting more full-fee overseas students and providing vocational post-graduate courses for which the Minister gave permission to change fees - in the expectation that this would not only reduce the Government's budgetary burden but also make universities more conscious of market pressures and opportunities; the introduction of competitive bidding for priority projects financed from DEET's Reserve Fund, for teaching quality schemes, for the expansion of enrolments, and grant-aided co-operative research centres designed to increase co-operation between university and business sector staff in interdisciplinary applied research and development projects. The clawback of funds from the pre-Dawkins universities to add to the funds of the Minister's Research Council was also designed to give the Council greater power over the fields of research. There have also been hints - as on page 29 of the DEET paper on *Recent trends and current issues in Australian higher education* prepared for the conference on the transition from elite to mass higher education held in Sydney in 1993 - that agreement between the States and Territories and the Commonwealth on mutual recognition of qualifications for professional practice 'may well involve uncluttering the curriculum of some specific content

and making room for some practical skills training.' (Even before that hint, the AVCC had expressed concern about the possible importation on HEIs of National Training Board accreditation processes.)

Correct diagnosis?

It is of course important to relate policies on reform to a correct diagnosis of current discontents. What blame should attach to HEIs for the currently high levels of unemployment and low levels of growth in the economy? Did the great increase in retention rates to Year 12 in secondary schools and the consequential great increase in enrolments in higher education make entrants to the work force less employable than in earlier periods? Did HEIs have the wrong mix of vocational and non-vocational degree courses? Should all courses be vocational? Could a much greater emphasis on competence-based teaching and learning create an education-led recovery? If shifts in university research activities proved effective in generating higher rates of technological change, would that ensure greater employment as well as higher growth rates in the production of goods and services?

In February 1993 in Australia, 6.2 per cent of the graduates in the labour force, and 16 per cent of graduates aged 22, were unemployed. When the general unemployment percentage is low the room for difference between the graduate and general unemployment rate is not great. In May 1976 the first was 2 per cent and the second 3 per cent, and in the following May 2.5 per cent and 3.7 per cent respectively. In February 1993, the graduate unemployment percentage was just a little more than half the general rate (12.1 per cent). The ratio of 1:2 was fairly typical of OECD countries in the early nineties.

When unemployment is high or particularly when it is increasing - in Australia it rose from 7 per cent in February 1990 to 12.1 per cent in February 1993 - new entrants to the labour force are particularly disadvantaged. Graduates aged 22 included a considerable proportion of recent graduates and an unemployment percentage 40 per cent above the general percentage was not surprising. In the broader age group, 15-24, effectively 20-24 for graduates, the graduate unemployment rate was the same as the general rate, less than the 13.5 per cent for those with trade qualifications and considerably less than the 23 per cent for those without post-school qualifications. In the 25-34 age group, the graduate

unemployment rate was down to 6 per cent, whereas the trade qualification rate was 10 per cent, and the percentage of those without post-school qualification 14.5.

These statistics do not indicate that there was an oversupply of graduates given the current nature of university and trade education and training. A continued increase in the supply of graduates relative to the demand for them should be signalled by a rise in graduate unemployment rates relative to general rates, or by a decline in the relative salaries of graduates, or by some combination of the two. The first has not happened. In the nineteen sixties and seventies the relative salaries of graduates did fall in Australia as in most OECD countries. However, at the end of the seventies there was still a substantial 'graduate premium'. (Lower in Australia and New Zealand than in Sweden and the UK and lower still than in Canada, the Netherlands and the US.)

Because of the rapid and significant increase in graduates as a percentage of the labour force, that decline in the graduate premium was not surprising. What was surprising, or at least not foreseen, was that except in Germany, France and the Netherlands, the graduate premium did not fall further in the eighties and in some OECD countries actually increased. In the USA the premium rose above the level of the early seventies and there were smaller increases in Canada, the UK, Sweden, Japan and Australia despite the continued increases in graduates as a percentage of the labour force.

In the OECD's *Employment Outlook* for July 1993, there is an analysis of the possible reasons for that change. The evidence does not support one possible explanation, namely, the growth in the proportion of employment in the services. The authors of the report decided that the explanation was to be found in changes in technology, reflected *inter alia* in the growth of non-standard forms of production, new styles of work organization and the increase in the importance of small firms, and in political pressure to reduce the importance of centralized salary and wage determinations. To their explanation could be added the growing importance of the further education and training, for which graduates are better prepared, required to make good use of opportunities to raise levels of technology.

As part of its recent inquiry into higher education and employment, the OECD requested member countries to report on their provisions for the continuing education of highly qualified manpower. These reports revealed great differences in the way in which further education and

training is managed in the OECD countries without providing anything like clear guidance on 'best practices' for HEIs. In *Corporate Classrooms*, N Eurich provided information on the large expenditures and activities of US corporations, and in *How the Japanese learn to work* R Dore and M Sako outlined the ways in which Japanese corporations promote further education, without appearing to spend as high a proportion on it as the Americans, by promoting an effective learning environment within their enterprises. In activities with high rates of innovation, much of the effective further education has to be provided within the enterprise or sector because of enterprise-specific technologies and developments in 'know how' which staff in HEIs do not have. Because of their activities in creating new knowledge and incorporating new knowledge in vocational postgraduate degree and diploma courses, HEIs will continue to have an important role in further education and training, but the higher the level of education in a community, the more is it likely that further education and training outside the formal education sector will grow relative to that within it.

Relevance?

At times of high general unemployment and particularly when such unemployment is increasing, the incidence of unemployment among recent graduates within 'non-vocational' degrees tends to be specially high. In its recent study of higher education and employment, the OECD requested member countries to submit separate reports on the relations between employment and graduates in the humanities and social sciences. The implication was that problems of employment were greatest for such graduates.

Not all students in the humanities and social sciences are enrolled in non-vocational degree courses. Apart from those enrolled in courses such as social work, psychology, law and education, there are many students in seemingly non-vocational degree courses who intend to proceed to a secondary qualification in education or law or business administration. In economics faculties there are usually options for students who plan to be accountants or statisticians. Nor are all non-vocational students concentrated in the humanities and social sciences - there are many in faculties of science - or all the high percentages of unemployed recent graduates restricted to the non-vocational graduates. There are, for

example, continuing fluctuations in the demand for recently graduated engineers and geologists, and occasional abrupt shifts in government policies which lead to considerable excess supplies of graduates in education, social work and even in medicine in some OECD countries.

It is important to look beyond the few months after graduation before making generalizations on the employability of recent graduates. It is clear from the movement of the Australian unemployment indices over time that types of graduates with initially high levels of unemployment do get absorbed. From a study of the unemployment of 1979 graduates five years after, Coyte concluded that, except in the early stage, graduate unemployment was not a problem. In a later study of 1985 University of Sydney graduates, Guthrie showed that in 1990 only 1.8 per cent were seeking full time employment. *Statistics Canada* has made a study of the labour force status of 1982 university graduates in 1987 and of 1986 graduates in 1988. The results are shown in the following table.

Labour force status (percentages)
 1982 Graduates in 1987 1986 Graduates in 1988

Field of Study	Employed	Unemployed	Not in LF	Employed	Unemployed	Not in LF
Education	93	3	4	92	5	3
Health	94	2	4	91	4	5
Business/ Commercial	93	3	4	90	7	3
Maths/ Phys Sc	87	4	9	85	7	8
Engineering/ Applied Sc	91	3	6	85	7	8
Humanities	85	4	11	78	13	9
Social Science	86	5	9	78	12	10
Fine/Applied Arts	85	4	11	75	16	9
Agriculture/ Biol Sc	77	5	18	64	12	19
TOTAL	89	5	7	84	9	7

Given the gap of only a year between the end-date of the five-year and the two-year studies and the fall in general unemployment of one percentage point between 1987 and 1988, the differences between the unemployment rates are significant. The early employment problems of graduates in the fine and applied arts, humanities, social sciences, agriculture and biological sciences (mostly the latter), were overcome within five years as a consequence of further education and learning on the job. One possibility is that over time these graduates became less choosy and accepted jobs that left them 'underemployed'. However,

although of the 1982 graduates in 1987 the percentage of bachelor graduates satisfied with their jobs was smaller in the case of the humanities (83) and the social sciences (86) than for all graduates (89) the difference was not great, and the difference for those with master's and doctor's degrees in the three fields was significantly smaller.

In Australia there is nothing comparable to the *Statistics Canada* surveys, though there is information on the starting salaries of the 1979 graduates of the University of Sydney and their salaries in 1984. In a grouping into 20 types of degrees, the starting salaries of law graduates were lowest but 5 years later they were the third highest. Economics graduates started at 12 and moved to 7, while humanities graduates started at 16 and moved to 10. By contrast, engineering declined from 3 to 5, education from 4 to 15, maths from equal 8 to 11, physical science from 8 to 16 and biology from 13 to 18. It seems that the graduates in law, economics and humanities displayed skills that their original employer had not expected or soon developed them during employment. The movement of the salaries of the engineering and science group did not.

The relation between median starting salaries of the 1985 University of Sydney graduates and their salaries five years later were very different from the relations between the starting salaries of 1979 graduates and their salaries in 1984. In 1985, law, economics, veterinary science and maths were equal eleventh in the table of starting salaries. Five years later, their respective rankings were equal 2 (with dentistry), 7, 11 and 13. Accounting moved from 16 to 5, pharmacy from 19 to 8, and architecture/building from 15 to 9, whereas physical sciences and biological science moved from equal 6 to 10 and 15 respectively, social work from 3 to 14, education from 4 to 16 and humanities from 9 to 17. The big change in pharmacy may have been due to a major rationalization of pharmacies, and that in architecture/building to a building boom from the mid to the late 80s. Clearly humanities graduates did not do as well as in the earlier period, engineering started lower in ranking than in 1979 but did not lose rank, the 'non-vocational' science graduates lost rank again, but so did the vocational graduates in social work and education. Relativities are likely to change again in the next five-year period as supplies adjust to expected salaries and employment and demand changes with rates of innovation, demographic shifts and the general state of the economy. As in the earlier period, the ratio of the highest to the lowest salaries increased markedly during the five-year period but did not change significantly between 1985 and 1990.

Based on the evidence provided in the *Statistics Canada* surveys, the author of the Canadian report to OECD on the employment of graduates in the humanities and social sciences concluded that 'the notion of trading in that degree in English for one in Engineering or Commerce' is unrealistic. They also quote Michael Useem's study of *Liberal education and corporation* (1989) in the USA to the effect that humanists can after a period of work experience and additional study compete quite successfully with graduates from fields of more immediate business value. The Report of the Council for Industry and Higher Education in the UK - *Towards a partnership*, 1987 - quoted the view of employers that many of our best and most creative recruits in many departments and at many levels have their educational backgrounds in the humanities. However, in its 1992 report, the Council reported that graduates in the humanities often had to be rejected because they could not handle quantitative material. That comment on humanities graduates reflects a major defect in the English school system that is not present in Japan where the difference between science and humanities curricula in the last year of secondary school is not great (see R Dore and M Sako, *How the Japanese learn to work*, 1989). In 1989 the Japanese Federation of Economic Organizations conducted an inquiry into how 421 large firms assessed the academic and personality traits of recent graduates. The results of the survey provided an interesting insight into both the nature of Japanese education and the traits which large firms thought significant. The results are shown in the table below.

**Evaluation of recent graduates in Japan
by academic/personality traits**

	Satisfactory % Technical	Satisfactory % Non-technical
Diligence	83	75
Congeniality	80	89
International awareness	53	66
Knowledge in speciality	50	17
Challenging spirit	33	35
Creativity	31	28
Persuasiveness	29	45
Spontaneity	26	34

Source: Kaneko, report to OECD on Higher Education & Employment in Japan, 1992.

It is not possible to judge from this survey how far the differences in personality traits were a consequence or a cause of the choice of different fields of education, and it is not clear just what 'knowledge in specialty'

was being assessed, but apart from that low assessment and the relatively low assessment of diligence, the non-technical graduates' ranking were ahead in all but creativity. In view of the high proportion of humanities and social science enrolments in Japan such assessments are very significant, and raise questions about the widespread view that the percentage of enrolments in science or engineering should be increased. (In the USA, UK and Australia, probably the greatest need is to raise the mathematical competence of secondary school pupils.)

An ideal distribution of students?

The distribution of students between the various fields of study changes considerably over time within countries and varies considerably between countries. The distribution within countries depends on interests developed during secondary schooling, the apparent prospects for employment and salary relativities, and the capacity of HEIs to respond to changes in student preferences. In all countries there have been considerable changes in the pattern of enrolments - most notably a decline in enrolments in education and an increase or enrolments in business studies. The capacity of HEIs to respond to increases in demand is most limited where the required facilities are very expensive - as in medicine, veterinary science and dentistry, and in several countries there is a deliberate government policy of restricting entry to such faculties and of facilitating growth in the less expensive fields. In Japan, the decision of the government in the mid 1970s to limit the supply of all places in state universities and to revise the Education Law to lift the status of Special Training Schools led to a substantial growth in short-cycle higher vocational education, and to a large growth in enrolments in the humanities and social sciences which the private universities were able to provide at relatively low fees.

The different national patterns of enrolment do not provide a simple guide to patterns most likely to promote employment and growth which, given the differences in school and post-school systems, is not surprising. A high proportion of students in the sciences and technologies is frequently taken to be an essential condition of high growth rates, but a comparison of Japan and Germany provides a warning against such an easy generalization. Until recently both countries had high growth rates, but whereas Germany did have a high proportion of enrolments in

science and technology, Japan did not - Japan however had a higher participation rate in higher education and could match German scientists and engineers relative to the labour force with lower percentages of enrolments in the sciences and technologies. There was a further difference - Japan had a much higher ratio of engineers to scientists than Germany, which might reflect a good manpower strategy during a period - now passing - when Japan could engineer high growth rates by adopting and adapting advanced western technologies, and that brings me to another key issue in the relation between higher education and employment, namely, the nature of technology.

The nature of technology

We have become used to the concepts of hardware and software in computing, and such concepts have a more general relevance to technology. Technology has both technical and social components, and levels of technology have been lifted by inventions or developments in both of them. The introduction of the assembly line in Henry Ford's factory in response to the shortage of skilled workers lifted the level of technology in the motor car industry, and the simplification of human tasks on the assembly line created the conditions for further mechanization. That in turn created the need for changes in work skills, work organization, reward systems, control systems, managerial structures and processes, and more generally, to exploit the productive potential of the new technical equipment. Those firms that were most effective in adjusting the social component of technology raised the level of technology furthest. The Japanese development of quality circles to extend the American techniques of statistical quality control, and of the just-in-time procedure to reduce working capital while ensuring continuity of production, are other examples of changes in the social components that lifted levels of technology.

Successful innovation itself requires skills not normally associated with scientists and engineers excepting those who have acquired additional skills normally associated with graduates in some of the humanities and social sciences. Inventions made by research scientists and engineers may or may not have the potential to create new or improved products and/or processes of production, and much industrial R&D lacks potential because the researchers did not interact with others

involved in production, marketing and finance, and made irrelevant inventions. For seemingly relevant inventions, success is far from assured, and in fact many innovations do not succeed. There may be technical problems that come to light when laboratory or workshop models are 'scaled up', there may be a need for new mental and manual skills which managers failed to identify or act upon in time, there may be a need for changes in work organization and reward systems for which workers were not prepared and resist, there may be a need for changes in design and price policies which, from inadequate market research, managers failed to identify.

Successful innovation requires cooperation between people with a great variety of skills - in conducting R&D, in managing the technical equipment, in production planning and control, in work organization, in industrial relations, in market research analysis, in financial planning and control, in general management, in a capacity to sense changes in market pressures or opportunities and to provide leadership. Scientists and engineers are of great importance in providing opportunities for technical innovations, but their degree of importance is frequently overestimated because of a failure to comprehend the importance of the social components of technology and the growing importance of that social dimension with the relative decline in manufacturing, and in the impact of computers and software packages which have consigned to the ark Henry Ford's 'you can have any colour you like so long as it is black.'

Once the importance of the social component of technology is given due recognition, the views of the Japanese employers on technical and non-technical graduates fall into place, as also the Australian employers' expectations of higher education graduates. At the top of their list are 'learning thinking/decision making skills' and 'learning communication skills'.

Graduates other than scientists and engineers have critical roles in raising levels of technology and making Australian producers more competitive in international trade, and 'non-vocational graduates' soon find a place in the work force at salaries higher than average weekly earnings. But it does not follow that the skills and attitudes of graduates make them as productive as could be. The 'enterprise initiative' for which funds are provided by a government agency in the UK for approved schemes in HEIs, and the competence based teaching and learning proposals in several OECD countries imply that HEIs could make their graduates more employable and productive. Australian universities have

always engaged in competence based teaching and examining, and in fields such as medicine, dentistry, pharmacy, nursing, engineering, architecture and accounting, government licensing authorities or professional associations have a considerable say in the broad outlines of curricula, the length of courses, and the areas of competence to be tested.

Many academic staff have expressed opposition to moves by the National Training Board and the National Office of Overseas Skill Recognition to shift the recognition of qualification to a basis of competence derived from currently performed tasks in the employment sector. Part of this opposition comes of course from staff in the 'non-vocational' faculties, but part also from members of professional faculties who emphasise the importance of new knowledge in changing the ideal nature of professional practice and fear that the traditional role of academics in sustaining the critical place of a knowledge-based teaching framework in the government licensing authorities and the professional bodies that accredit courses will be undermined by too great an emphasis on current labour market needs. To derive standards of competence from the current levels of technology in the bulk of Australian employment activities and to expect or require HEIs to base their teaching on them would be a recipe for continued mediocrity.

The increase in the age of recruitment and the effects of higher education on the expectations and responses of such recruits, have increased the interests of employers in the skills and attitudes of graduates from the various fields of study, and particularly so when not appointing to specialist positions where qualifications are accredited by government bodies or by professional institutes. Employers' lists of desirable qualities do not vary greatly from country to country when specified on a level of generality that is not very revealing. They expect graduates to have well developed powers of oral and written communication, analytical and problem solving skills, a capacity to work with others, qualities of initiative and leadership, a capacity for sustained effort and an interest in acquiring further vocational skills. But is it reasonable to expect oral and written communication skills in any field of knowledge or language? Do graduates in history or law have problem solving skills in fields of medicine or engineering? Do qualities of initiative and leadership always go together? And if some of the hoped-for qualities are more developed than others, is it reasonable to expect trade-offs to be the same for different sectors of activity and for different levels of responsibility? How useful would be graduates from degree courses which produced Jacks-of-all-such-

skills at the expense of being Masters-of-any, by comparison with graduates from more traditional disciplinary courses - equally for all sectors of the economy, for all positions? My answer is 'no' to all these questions. Employers' general lists of what they expect from graduates do not provide the basis for higher education policy if only because they cannot cope with the complication of levels of knowledge and skill.

Manpower planning?

The growth of government and business sector criticism of HEIs during periods of high unemployment implies a belief the unemployment would fall if HEIs matched their academic courses to the needs of employers. Apart from the odd implication that HEIs had done such matching during the preceding extended period of low unemployment, the fact is that HEIs do not know how to predict employers' demands for a great range of changing skills and employers do not know either. What is important to keep in mind is that only a part of the growth in higher education has been due to the autonomous growth in employers' demands for graduates.

Many factors contributed to the great increase in higher education after the Second World War. The Declaration of Human Rights, adopted by the General Assembly of the United Nations in 1948, asserted that all had the rights to work and education. That declaration reflected social and political values in democratic or would-be democratic societies. The achievement of universal primary education created a pressure to increase provisions for secondary education, and that in turn created pressures to increase provisions for higher education. The growth in the social demand for higher education has been a very important factor in the growth of higher education and change in the recruitment policies of employers. Employers accustomed to recruiting naturally able and ambitious young people from fifth and sixth forms found that they were progressively less able to do so. They had to recruit such young people from HEIs. That is sometimes referred to as credentialism though in that case the employers were simply adapting to changes in the nature of entrants to the labour market. To get a reasonable share of the able and ambitious new entrants to the labour market they were forced to adapt and many grumbled about the need to do so.

Declarations about the **right** to education seldom specify the reach of such a right. The very high rates of increase in GDP per head in the fifties,

sixties and early seventies made it easy to extend the reach. Government revenues were buoyant and so too were family incomes, and governments spent much more on higher education institutions and on encouragement to students to enrol in them. Families also spent more on the education of their children even if - as in the case of the poorest families - it only involved keeping children off the labour market to complete secondary education and then enrol in higher education.

In addition to the greater financial ease in financing a social policy of greater access to higher education, higher education also became a more important part of government economic policies on employment and growth. Analyses such as Hilgert's *Industrialization and foreign trade* (published by the League of Nations in 1945) convinced governments (or their advisers) in the mature economies that their employment and growth would be threatened by further industrialization in the developing countries unless they promoted the science-based industries and increased rates of innovation through more research and experimental design and development. The power of 'science at war' helped to convince governments that they should finance more 'science in peace' and such finance included provision for greater supply of graduate scientists and engineers and more R&D in HEIs. That 'lesson of war' was reinforced by the results of econometric studies of the sources of growth in the fifties and early sixties. It appeared that there was a substantial element in growth not explained by increases in measured inputs of labour and capital. That unexplained component was called the 'residual factor' and the 'technical progress component', and by a not impeccable process of deduction the credit was given to education and research. (That it was not an impeccable deduction was made clear when in the seventies, despite the continued increase in higher education and research, the residual factor became negative, but such clarity came later, and the policy of 'investment in people' had become firmly established.)

The **opportunities** for innovation were greatly increased by the expansion of R&D financed by governments, and many firms in the business sector increased their own R&D, for which they demanded more research scientists and engineers, and their rate of innovation for which they demanded more engineers and technicians. The growth in government activities also increased the demand for graduates which the Murray Committee in Australia emphasized when it predicted a growth in the demand for 'graduates of all kinds'. However the specified need for additional graduates from employers was very much less than the

additional supplies, and that created a problem of the absorption of graduates in fields not previously regarded as 'fit for graduates'. That process of absorption went very smoothly during the fifties, sixties and early seventies, though less smoothly since. However the employment rates for graduates indicates that the process of absorption is still an active one, and the fears that the decline in the rate of growth in the government sector would greatly reduce the apparent efficiency of the process have so far proved groundless. It seems that the greater supply of graduates creates its own demand.

Twenty years ago, at an OECD conference on the future structures of post-secondary education, Martin Trow read a paper on 'Problems of the Transition from Elite to Mass Higher Education' published in *Policies for higher education*, OECD 1974. His analysis was doubtless influenced by the operation of the Californian Master Plan dating from 1960. From that experience Trow attempted to define and illuminate the problem of expanding higher education likely to be common to OECD countries. It was a notably successful attempt. Trow wrote of elite university systems as 'sponsoring systems' in the sense that graduates could assume that there would be 'elite positions' waiting for them. Once enrolments rose above 15 per cent of the age group that ceased to be so, but 'by entering the job market without prior conceptions of inappropriate jobs, graduates can upgrade the jobs that they take, both in status and in the scope they give for the application of skills and initiative' (p 91). They become jobs fit for graduates. That increases the pressure on school leavers to enter higher education, which in turn puts pressure on employers to recruit more graduates. But the continued willingness of governments and parents to encourage and finance that evolution depends on the continued ability of HEIs to produce graduates with the skills and initiative that give them the capacity to upgrade the jobs not previously thought fit for graduates.

The great increase in higher education is in large measure a consequence of greater wealth, and so too is the growth of the services sector relative to the primary and secondary sector. The nature of the services sector - which in Australia provides two-thirds of the jobs, with almost 40 per cent of those jobs in 'community, social and personal services' - is such that it provides a great range of opportunities for graduates and for graduate development.

Employment

HEIs played a conscious part in promoting 'investment in people'. They did so partly on grounds of 'the right to education' and the role of higher education in making citizens better able to benefit from, rather than be victims of, advanced industrial societies. But they also identified with the view that the greater public investment in higher education would pay for itself as a consequence and higher growth rates in the production of goods and services.

HEIs also played an unconscious part in our current problems by contributing to technological change through their own R&D, and the production of graduates who used the opportunities provided by university and industrial R&D to introduce new and improved products and processes of production. For technological change has never been a smooth process. Since 1750 the only period of sustained rapid technological change and low unemployment was 1950 to 1973.

Technological change both displaces labour in established forms of production and creates a demand in new forms of production, and these negative and positive influences on employment are seldom in balance. Innovations which reduce labour per unit output may for a time increase the demand for labour. If labour per unit output is reduced by, say, 10 per cent but the reductions in price or increases in quality increase demand for output by more than 10 per cent employment will increase. That until recently was the situation in the motor car industry. But eventually for a given population the demand for labour must fall unless there is sufficient product innovation to sustain the demands of consumers and create new jobs.

In a remarkable essay on 'The economic possibilities for our grandchildren' written in 1930, Keynes predicted that within 100 years our needs - other than the needs of the second class which satisfy the desire for superiority, the positional goods of which Kirsch wrote over 30 years later - would be so satisfied that we would 'prefer to devote our further energies to non-economic purposes.' In his *Theory of wages*, Paul Douglas concluded from his statistical analyses that in industrialized countries workers chose to take around 20-25 per cent of potential increases in real wages in the form of shorter hours. In the last 100 years, hours of work have been halved as a consequence of the interaction between

technological change and the trade-offs between the purchase of more goods and services and the choice of shorter hours.

Annual hours of labour may be reduced by making the working week shorter or by increasing the length of holidays. Life hours of work may be reduced by an additional two changes - namely, by reducing the age of retirement and by increasing the age of entry to the labour market. In recent years in Australia real wages have not increased, but potential life hours of work have fallen as retention rates in schools and participation rates in higher education have increased. Part of that increase was a consequence of high youth unemployment. (That response is not new. In *Matters for judgement*, Sir John Kerr recalled that when employment collapsed for school leavers in 1930 an annexe was added to Fort St High School 'to take three or four hundred pupils from various intermediate high schools into the fourth and fifth years because they could not get work.')

During this depression there has been a continued increase in productivity. That is sometimes referred to as job-less growth and there have been many predictions that such growth will continue. A longer term tilt to technological change so that the labour-saving process innovations grew much stronger than product innovations could have that effect. In such cases the sharp reductions in normal hours of work predicted by Keynes - within 100 years from 1930 a 15-hour week - would be needed to prevent sharp increases in unemployment. At the present time, however, sharp reductions in normal hours would not increase employment. There would be very strong union resistance to such a reduction unless hourly rates of pay were increased, and given the current level of labour on-costs, wage costs would be increased by work sharing even if hourly rates were not increased.

Labour-creating technological innovations may soon strengthen as they did after the depression of the thirties, and if so we can expect a further trend reduction in annual and life hours of work - the weaker the labour-creating effects of technological change relative to the labour-saving effects, the stronger the trend reduction would need to be for hours to be consistent with higher levels of employment. The move to Trow's third level of universal higher education would become part of both social and economic policy, and in the many purposes of higher education the emphasis on paid work skills would presumably decline in importance.

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For further information on any of these matters, please contact the Departmental Secretary, Centre for the Study of Higher Education, University of Melbourne, Parkville, Victoria, 3052, Australia.

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