POLICY ISSUES FOR AUSTRALIA'S EDUCATION SYSTEMS: EVIDENCE FROM INTERNATIONAL AND AUSTRALIAN RESEARCH

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The purpose of this paper is to discuss education policy issues in the context of empirical evidence. We address two broad policy areas: education in Australia; and the transition from school to work. This paper draws on research from a variety of sources, in particular international studies of student achievement, and Australian longitudinal studies on the transition from school to work. These studies are summarized in the appendix. Over a period of more than two decades, there has been an accumulation of evidence from these and other sources (such as statistical compilations from the ABS and OECD, and smaller cross-sectional studies) that provide an important basis to inform debates about policy and practice in Australian education.

SCHOOL EDUCATION

Student Performance

A fundamental point is that the performance of Australian secondary school students is high by international standards. The *Third International Mathematics and Science Study* (TIMSS), conducted in 1994, found that Australian performance in mathematics in the junior secondary years was lower than only eight (out of 45) countries. The performance of Australian students was significantly better than countries such as New Zealand, England and the United States (Lokan, Ford, & Greenwood, 1996:15-16). The performance of Australian students was similar to the performance of students in Canada, Ireland, Sweden and France. In science, only four countries outperformed Australia: Singapore, Korea, Japan and the Czech Republic. Australia recorded science achievement levels similar to England and the United States, as well as most of the countries that were similar to it in mathematics.

In the 1999 TIMSS study Australian students performance in mathematics was again well above the international average (by about 0.4 standard deviation units) (Mullis et al., 2000:32). Australia was significantly lower than six countries (Singapore, Korea, Chinese Taipei, Japan and Flemish Belgium). It was not different from a second group of countries that included the Netherlands, Canada and Finland and the Czech Republic. It performed significantly better than countries such as the United States, England and New Zealand. In science Australia also performed above the international average (by about 0.5 of standard deviation) (Martin et al., 2000:32). In science only Chinese Taipei scored significantly higher than Australia. Australia was not different from a group of countries that included Singapore, Japan, Korea, the Czech Republic, England, Canada and Hong Kong. It outperformed countries such as the United States, New Zealand and Italy.

The most recent evidence on student performance is from the 2000 PISA study of 15 year olds in over 30 industrialised countries. Australian students performed well above the OECD average in the three domains of reading, mathematics and science. (Lokan, Greenwood, & Cresswell, 2001:20-33). Students in Finland were the only national group that performed significantly better in reading literacy than Australian students. Students in Japan were the only ones who performed significantly better than Australian students

in mathematics. Japanese and Korean students were the only national groups that performed significantly better than Australian students in scientific literacy.

Therefore, there is consistent evidence that Australian students are performing at levels that can be regarded as very good. This finding is no doubt a surprise to those continually reminded of the inadequacies of the Australian education system. This 'good news' finding is often overlooked. However, this positive finding is significant. It is important to find out what Australia is 'doing right'. It may be the high quality of teaching or teacher education, competition between government and non-government schools, the academic environment of schools, the curriculum, or other aspects of educational policy.

The finding that the performance of Australian students is well above the OECD average is also important to debates about the funding. Since Australia spends (slightly) less of its GNP on education than other comparable countries[1], it could be argued that Australia spends its resources more effectively than other countries. To many involved in Australian education such propositions may appear unlikely but it is important for policymakers to identify why the performance of Australian students is higher than that of most other countries.

Although the performance of Australian students is higher than most comparable countries, there are no grounds for complacency. There is no evidence that the (absolute) performance of Australian students has improved over time. Rosier (1980) focussed on changes in mathematics achievement between 1964 and 1978 and concluded that there had been a slight decline in the performance of 13-year-olds over that period time. Afrassa and Keeves (1999) concluded that there was a decline in the mathematics performance of 13-year-olds over the 30 years from 1964 to 1994. The magnitude of that decline was approximately 30 scale points (or 0.3 standard deviations), a non-trivial decline. Over the period from 1975 to 1995 there was little systematic change in the performance in reading literacy (Marks & Ainley, 1997). Comparison of science performance between 1994 and 1998 suggest that the relative position of Australia in the country league table of student performance improved (Martin et al., 2000:35). However, in absolute terms there was little change in mathematics and only a slight improvement in science.

Therefore, the performance of Australian students is high by international standards, but there is no evidence that this high standing is due to improvements in student learning over the last 30 years. There are a number of strong arguments to further increase the achievement levels of Australian students. For individual students, proficiency in literacy and numeracy is by far the most powerful influence on a range of educational outcomes including early school leaving, tertiary entrance scores, and participation in higher education (Marks, Fleming, Long, & McMillan, 2000; Marks, McMillan, & Hillman, 2001:19; McMillan & Marks, Forthcoming). In addition, literacy and numeracy are important influences on labour market outcomes such as not becoming unemployed, the duration of unemployment, and income (Marks & Fleming, 1998b; Marks & Fleming, 1998c; McMillan & Marks, Forthcoming). The *International Adult Literacy Study* shows large labour market differences between high and low literacy groups (Kirsh, Jungeblut, Jenkins, & Kolstad, 1993). At the macro-economic level there is strong case to improve student performance in literacy and numeracy, since the economy is likely to be increasingly reliant on industries based on the manipulation of symbols (words and numbers).

An important policy question is to how to improve the performance of students at the bottom end of the distribution. Poor skills in literacy and numeracy are the strongest risk factor for unsuccessful school to work transitions — a much stronger risk factor than low socioeconomic status. It is possible for a country to achieve both high average levels of student performance and small variation. This involves policies that lift the performance of weaker students without undermining the performance of other students. Some progress has already been made in mathematics and science where the spread of achievement scores is less than or close to the OECD average (Lokan et al., 2001:31,32).

Educational Participation in Senior Secondary School

One of the most dramatic changes that has occurred in Australian education over past two decades is the rapid increase in Year 12 participation from 35 per cent in 1980 to a peak of 77 per cent in 1992, which has since declined somewhat to just over 70 per (ABS, 1984-2001). However, participation in the final year of school in Australia is lower than that in many other countries. According to the OECD, 78 per cent of sixteen year olds in Australia are enrolled in upper secondary school. This figure is lower than the OECD average of 84 per cent and is considerably lower than enrolment rates (for the same age) in Austria (90 per cent), Belgium (97 per cent), Canada (85 per cent) and Sweden (96 per cent) (OECD, 1998:170). However, school completion in university-oriented programs in Australia is higher (66 per cent), than the OECD average (OECD, 2001a:146).

The lower level of participation in Australia poses the policy question of whether participation rates should be increased. This involves an assessment of how those who do not complete secondary school are faring in the labour market. The early labour market experiences of non-completers are highly dependent upon the economic climate. Research on non-completers who entered the labour market during the early 1990s showed that this group were experiencing substantially poorer labour market outcomes than an equivalent group who had left school a decade earlier (Lamb, Dwyer, & Wyn, 2000). On the other hand, research on a more recent group of non-completers who entered the labour market later in the 1990s when the economy was more buoyant, presents a more positive picture. A year after leaving school 72 per cent had obtained full-time jobs and 11 per cent were looking for work (Marks & Fleming, 1998a). Research following the progress of this group to age 19 shows increasing levels of full-time work, incomes and occupational status. Full-time work in the group of non-completers who left school on or before the completion of Year 10 was higher than among the non-completers who left school during Year 11 or Year 12. Nevertheless, these 'later' non-completers also show generally positive outcomes, with small and declining proportions looking for work (McMillan & Marks, Forthcoming).

However, the labour market outcomes of school non-completers differ from those of other groups of young people. In a study of youth cohorts spanning nearly 15 years, it was found that Year 12 participation reduced the chance of becoming unemployed (Marks & Fleming, 1998b). Although the proportion of young people completing Year 12 increased during the period investigated, the effect of Year 12 participation did not decrease. Furthermore, the study took into account other influences on unemployment such as qualifications, labour market experience, and school achievement.

Those who do not complete secondary school have poorer labour market outcomes than those with university qualifications. It is well established both in Australia and overseas that university qualifications are associated with higher incomes, less unemployment, and

more steeply rising occupational and income trajectories. When making comparisons between non-completers and those school completers who do not pursue university studies, the evidence from Australian research is equivocal, at least in the initial post-school years. A study of recent school leavers shows that in some regards non-completers fare better than school completers who do not enter higher education: they are more likely to be in full-time employment and receive higher hourly earnings, at least initially. However, in other regards non-completers experience less successful transitions from school: compared with completers who did not enter higher education, male non-completers are more likely to be unemployed, and female non-completers are more likely to be outside the labour force (and not studying) (McMillan & Marks, Forthcoming).

During the last decade one policy response to the labour market outcomes of school non-completers was to increase participation in school. This involved increasing the range of subjects so that students were more engaged with school. This policy direction was in part a product of research that suggested that non-completers left school because they were alienated from the academically orientated curriculum. This is undoubtedly true for some students although the conclusion may have been over-stated. Longitudinal research on a cohort of young people who were in Year 9 in the mid 1990s shows that the majority of non-completers leave school for positive work related reasons. About 50 per cent say the main reason they left school was to get a job or an apprenticeship (whether or not they actually had a job to go to), and a further 5 per cent say they wanted to earn their own money. Only 13 per cent said their main reason for leaving was that they did not like school, only 6 per cent left because of the subject choice at their school, and only 2 per cent said they left on the advice of teachers. Interestingly, only 1 per cent cited financial reasons (McMillan & Marks, Forthcoming). Although, subjective evaluations may include *post-hoc* rationalizations – non-completers are most often students with lower achievement levels – these data do indicate that schools and the school curriculum are a much smaller influence than generally believed. The policy implication of these results is that further efforts to make Year 12 more 'attractive' to potential school leavers may not be the most appropriate strategy.

Given that many non-completers have positive reasons for leaving school and the majority do obtain full-time work, is there any reason why a student, keen to leave school and enter the labour market should not do so? In addition to schooling, experience in the labour market experience is an important factor in career trajectories. Furthermore, a comparison of four youth cohorts shows that the influence of labour market experience on full-time employment is becoming more important (Marks & Fleming, 1998b). However, in assessing policy options for the senior years of secondary school there is a number of issues to consider.

Assessments about the current and future state of the youth labour market provide crucial contextual background for the formulation of policy options. As suggested above, the substantially more favourable labour market experiences of school leavers during the late 1990s compared to the mid 1990s, is likely to have been due to the improvement in the economy. In an analysis of unemployment in three Australian youth cohorts, a large contextual effect of the annual unemployment rate was found (Marks & Fleming, 1998b). The OECD reported that, in general, countries with healthier economies and lower unemployment show more successful school to work transitions (OECD, 2000b:37-43). Therefore, maintaining strong economic growth and further reducing unemployment is a necessary precondition for allowing students to leave school before completion of Year 12.

A second issue is providing greater flexibility in returning to education. A problem with early school leaving is that it reduces options for further (especially higher) education. Universities typically judge prospective students on their performance in Year 12, so non-completers face barriers if they wish to pursue a higher education course at a later time. Therefore, encouraging universities to adopt flexible entrance requirements for young people who did not complete Year 12, and providing other forms of further education, would represent a policy alternative to increasing school completion. Many universities already have such flexible provisions for later age entry.

A third issue is the cost to employers in employing young people who have just left school. Employers need to be encouraged to employ those who have not completed secondary school and to provide associated training to develop their skills. This could include the further extension of formal training provisions to industries that do not traditionally take apprentices. This has been the thrust of the new apprenticeships and traineeship schemes. Another more contentious policy option is to reduce the marginal cost to employers of employing recent school leavers.

Finally, it is important to assist those young people who are experiencing unsuccessful transitions to the labour market. Estimates from a study of recent school leavers suggest that 9 percent of school non-completers and school completers who do not enter higher education (or 6 per cent of all school leavers) remain in marginal activities[2] throughout the late teenage years (McMillan & Marks, Forthcoming). Policies such as intensive assistance are designed for the long-term unemployed but often cannot assist (or locate) those young people who have not applied for social security benefits. Closer cooperation between schools and the Department of Family and Community Services is likely to be beneficial. It should be possible to monitor more closely the performance of those who leave school and do not pursue university studies.

VET-in-Schools

In Australia, a number of vocational education and training (VET) programs are available to students who are still at school and this has been a substantial area of growth throughout the 1990s. Nationally, approximately one quarter of the student cohort from Year 9 in 1995 had participated in some form of VET as part of their studies in Year 11 and 12 (Fullarton, 2001). These data indicate that some 15 per cent of school students had undertaken some VET-in-Schools subjects at either Year 11 or Year 12, and 7 per cent had completed subjects in both Year 11 and Year 12. Only a few (slightly more than one per cent) had participated in a school-based new apprenticeship or traineeship. Interestingly there are substantial differences among jurisdictions in participation in VET. The highest level of participation is found in Queensland (41 per cent) and the lowest in Victoria (12 per cent). Participation in VET in schools is also higher for students from government than Catholic or independent schools and among students with below average achievement levels (Fullarton, 2001). Lamb et al. (1998) note that VET-in-schools tends to attract students with parents in manual occupations.

There is little research on whether VET-in-schools programs benefit its participants. Malley et al. (2001) argue that most of the participants in VET in schools would have stayed at school anyway and that the availability of VET programs did not attract potential early school leavers to remain at school. Fullarton (2001) found that the unemployment rate for the VET-in-schools group was similar to that for the comparison group. Furthermore, VET-in-schools does not facilitate entry to a recognised form of

post-secondary vocational education or training. These results indicate that the labour market outcomes of VET-in-schools participants should be carefully monitored. It could be argued that these students would have better labour market outcomes by directly entering the labour market, and their training needs met by the TAFE system. Schools are arguably less equipped to provide vocational training since they usually have only weak links to the labour market and have limited financial and human resources to provide suitable such training.

PARTICIPATION IN HIGHER EDUCATION

Another important feature of Australia's education system is an increasing participation in higher education. In 1999, total higher education enrolments were 686,000, more than twice the 330,000 students enrolled in 1980 (DETYA, 2000:8,15). Estimates from the *Longitudinal Surveys of Australian Youth* show that approximately 40 per cent of recent youth cohorts participate in higher education. The comparable figure for the early 1980s was 20 per cent (Marks et al., 2000).

Over the last decade, the growth in higher education enrolments has been between 2 and 10 per cent per annum, a figure that is much higher than the population growth rate. The OECD reports that university enrolments in Australia increased by over 25 per cent between 1990 and 1996. However, the growth in University enrolments between 1995 and 1999 was considerably less, with Australia showing the seventh lowest growth of 21 OECD countries (OECD, 2001a:152).

Overall, the OECD estimates the proportion of the age cohort entering higher education in Australia at 45 per cent (this figure includes TAFE diplomas). This participation rate is the same as the OECD average and comparable with the United Kingdom and the United States (OECD, 2001a:155).

Attrition from university courses is a concern. An Australian longitudinal study of the cohorts that commenced university in 1992 and 1993 estimated ultimate completion rates of 72 and 71 per cent respectively. For the 1992 commencing cohort, 60 per cent had completed an award in their original university by 1997 and 64 per cent had completed an award by 1999 (Martin, MacLachlan, & Karmel, 2001; Urban et al., 1999). However, attrition in Australia is not particularly large compared to other countries. The ratio of graduates to enrolled students in any year is 27 per cent for Australia which compares favourably with the OECD average of 19 per cent, but less than that for the United Kingdom and the United States (OECD, 2001a:169).

The labour market outcomes of graduates are superior to those of non-graduates in terms of both reduced unemployment and higher incomes. Analysing pathways over a seven-year period (from the late 1980 to the mid 1990s), only 6 per of graduates[3] experienced extended periods of unemployment, part-time work, and not being in the labour market. This compares with between 20 and 30 per cent of non-graduates (Lamb, 2001:8; Lamb & McKenzie, 2001:25). In 1998, unemployment among 20-24 year old university graduates was substantially lower (around 3 per cent) than that for other educational groups. Similar differences are found in most industrialized countries (OECD, 2000a:270). Although completing a university degree is associated with a lower incidence of unemployment, a degree does not have an independent effect on unemployment during the early career, after taking into account other influences such as age, and literacy and numeracy achievement in middle schooling (Marks & Fleming,

1998b). Nethertheless, while university graduates do experience initial bouts of unemployment in their early career, they have much smoother employment pathways than other young people.

The higher income returns from university qualifications are well documented. The OECD reports higher incomes for university graduates (compared to the mean income) in all 20 countries investigated (OECD, 1998:352). The increase in income inequality observed in several countries (including Australia) is often attributed, at least in part, to increased (relative) returns to degrees. In the early career, a university qualification is one of the strongest influences on income, increasing hourly earnings by around 20 per cent, net of other influences (Marks & Fleming, 1998c).

The issue of increasing participation in higher education should be considered and debated. There are compelling arguments in favour of increasing participation. First, there is strong demand in the labour market for university graduates. The predictions, 20 years ago, of underemployment and decreasing wages of graduates has not eventuated. If anything, the strong demand for graduates is increasing. Second, much of Australia's economic and employment growth in the medium to long-term is likely to be in industries that employ graduates. In addition, industries that have traditionally employed students with a vocational education are likely to become more technologically sophisticated and require a different set of skills. Finally, there is considerable unmet demand for higher education. Surveys of Year 9 students indicate that approximately 70 per cent intend to go to university. Although not all students in this group are suited to higher education, it does indicate a high level of demand. The main argument against increasing participation in higher education is cost. Although HECS and other measures have reduced the per capita cost of university education, most undergraduate teaching is supported from taxation revenue. It is widely agreed that the present system needs review and cannot sustain further increases in university places.[4]

POST-SECONDARY VOCATIONAL EDUCATION AND TRAINING

Vocational education and training (VET) is an important part of the Australia's post-secondary education system. Most (over 95%) vocational education and training is provided in institutes of technical and further education (TAFE). Courses include a range of vocational training from entry-level employment preparation, to trades, through to advanced vocational, para-professional and professional courses. In addition, many recreation and leisure programs are provided. In 1997, approximately 121 000 TAFE students graduated with a qualification from a vocational course of at least 200 hours or one semester in duration (NCVER, 1998). Overall, there were 1.4 million enrolments in VET programs in 1997. Participation is characterised by part-time attendance and a wide age range (persons aged 15-24 years comprise 38 per cent of the clients). Entry to many courses is possible after Year 10, but in practice nearly half of the entrants to vocational courses have completed Year 12. In the early 1980s, the corresponding proportion was one fifth.

Apprenticeships are an important component of VET. Over three to four years an apprentice works for an employer (or group of employers) and attends a training institution (traditionally a TAFE institute, typically for a total of 800 hours). Recent changes have occurred in response to perceived limitations in the apprenticeship system (inflexibility, limited occupations, old technology, and lack of access for women) and declining numbers. In 1985, traineeships were introduced to provide a shorter and more

flexible approach to entry-level training. Traineeships typically involved a one-year program with an employer incorporating on-the-job and off-the-job training, mostly in office-based and retail industries. More recently, apprenticeships and traineeships have been integrated as part of a more unified entry-level training system. In the mid 1990s, 18 per cent of males had participated in an apprenticeship by age 19, 5 per cent had participated in a traineeship and 25 per cent participated in a non-apprenticeship TAFE course. The comparable figures for women were, 2 per cent for apprenticeships, 7 per cent for traineeships and 29 per cent in a TAFE course (Lamb et al., 1998:20).

Participation in vocational education is higher among males, students from lower socioeconomic backgrounds, rural students, and English-speaking (rather than non-English speaking backgrounds) backgrounds. Furthermore, VET participants are more likely to have attended Government or Catholic schools (rather than independent schools), have low achievement levels in literacy and numeracy, and to be school non-completers (Lamb et al., 1998:19-29). This is the opposite pattern to participation in higher education.

Overall VET participation increased between the mid-1980s and mid-1990s. However, there were declines in the proportion undertaking apprenticeships by age 19 (among males from 26 to 18 per cent)[5] and increases in the proportion participating in TAFE courses by age 19 (among males from 10 to 25 per cent) (Lamb et al., 1998:20). The OECD estimates the proportion of 18-21 years olds currently enrolled in non-university tertiary education (VET) in Australia is around 8 per which is slightly higher than the OECD average of 5 per cent (OECD, 1998:184).

Apprenticeships are associated with lower rates of unemployment in youth cohorts (Marks & Fleming, 1998b) (McMillan & Marks, Forthcoming). However, a non-apprenticeship TAFE qualification does not significantly reduce the incidence of unemployment (Marks & Fleming, 1998b). This may reflect the breadth of programs offered through TAFE, ranging from basic preparatory courses (leading to subsequent participation in other courses) to diploma programs, and the different purposes of these programs. More needs to be understood about the differential impacts of different types of VET (and TAFE) programs.

There appear to be relatively small income benefits to individuals from participation in VET. Overall the analyses of the successive cohorts in the *Youth in Transition* study showed small income gains from completing a vocational education qualification. The income returns to apprenticeships were initially substantial but fell with age. Between the ages of 28 and 33, having completed an apprenticeship had no significant impact on earnings. The returns to (non-apprenticeship) TAFE certificates were negligible (Marks & Fleming, 1998c).

These findings for vocational education that apprenticeships improve employment prospects but that vocational education, in general, does not substantially increase earnings is consistent with other work in Australia (Dockery & Norris, 1996; Nevile & Saunders, 1998). Furthermore, such findings are similar to that found in other countries (Ryan, 2001). In part this reflects the industries and occupations, which these programs provide access. It reflects the reward structures in the Australian labour markets rather than the effectiveness of the programs as such. Furthermore, these analyses focus on the benefits to individuals rather than enterprises or the overall economy.

Since VET is closely aligned with industry, shifts in employment patterns impact on its development. One source of change arises from shifts in employment away from industrial sectors traditionally served by VET (eg. manufacturing) and the growth in other sectors such as hospitality and service (clerical and office) industries. This results in changes in the institutional organisation of VET (for example within TAFE institutions and between TAFE and other VET providers), the areas in which programs are provided (eg the emergence of formal training arrangements such as traineeships and new apprenticeships in industries not previously involved in apprenticeships) and the forms of provision that emphasise skill-specific modules of training rather than structured courses leading to a qualification. Another source of change arises from the shifting vocational demands within industries that emphasise higher-order transferable skills that can be adapted to new workplace demands.

Changing VET programs in response to these pressures may result in a closer relationship between VET and higher education, so that TAFE diploma programs overlap with university degree programs to a greater extent. As these changes emerge there will be a need for greater attention to issues concerned with accreditation, recognition of prior learning, and coordination of administration. At present responsibility for administration and delivery of VET resides with the state and territory governments (within a national strategic plan developed through a ministerial council on the advice of the Australian National Training Authority). In terms of student fees, there have been arguments that the principles of the Higher Education Contributions Scheme should be applied to VET so that funding becomes more compatible with that in universities. This may be premature given that the income returns to VET are considerably lower than that for university degrees and that much of the participation in VET is directed to short duration certificates and training modules.

DIFFERENCES IN EDUCATIONAL PARTICIPATION AND OUTCOMES

One of the enduring themes in survey research in education has been concerned with equality. At one level this has concerned equality of access or opportunity and has focussed on participation in postcompulsory schooling and university education. In more recent years there has been a shift to a focus on equality of outcomes in which it has been argued that there should not be differences in outcomes among social groups (for example, between males and females and between different socioeconomic backgrounds). In this section we review research on social inequalities on educational outcomes.

Gender

Over the last three decades, gender differences in educational outcomes were one of the most prominent issues on the educational agenda. In 1970 boys were more likely to complete school than girls and had higher levels of participation in higher education. These inequalities contributed to other inequalities in the labour market, such as gender differences in income and occupational status. Over the last twenty years, there have been substantial changes in the gender differences on most educational outcomes.

Participation

In Australia, gender differences in educational participation have been reversed. During the early 1980s, Year 12 participation for girls was only 3 percentage points higher than

that for boys. By the late 1980s, the gender gap in Year 12 participation had increased to around 10 percentage points (favouring girls). Similarly, the gender gap in higher education has increased over time from no gap in the early 1980s to 9 percentage points during the late 1980s (Marks et al., 2000). These changes have also occurred in most OECD countries. In 17 of 21 OECD countries, school graduation rates for women exceed those by men. Differences in university-orientated courses are even stronger (OECD, 2001a:140, 146). Across the OECD world, young women show higher levels of educational attainment than young men, the reverse of the situation for older cohorts (OECD, 1997: 35, 320-321).

Over the last two decades there has been a clear and continuing trend of higher female participation in tertiary study, especially in university programs (Bradley & Raminez, 1996). University graduation rates are higher for women than for men (OECD, 2001a:166). However, gender differences in graduation rates for second degrees are much smaller, and in advanced degrees men still tend to outnumber women. This pattern is also found in Australia, where 58 per cent of first-degree graduates, 52 per cent of second degree graduates, and 40 per cent of advanced degree graduates are women (OECD, 2001a:173). An Australian longitudinal study of university commencing students in the early 1990s found that women were almost ten per cent more likely to complete an award course than men (Martin et al., 2001; Urban et al., 1999).

Achievement Studies

In international achievement studies of reading literacy, females outperform males. Across all OECD countries in the PISA study of 15-year-olds, females scored higher on the reading literacy test than males. The differences ranged from 14 points in Korea to around 50 points in Finland and New Zealand, with the average difference being 32 points (one third of a standard deviation). In Australia, the difference between males and females was 34 scale points, about the average for the OECD. Within Australia there are indications that gender differences in reading achievement have changed over time. Marks and Ainley (1997) reported a decline in the proportion of boys attaining mastery in reading.

In the Australian 1994 TIMSS study, differences between males and females in mathematics and science were not statistically significant. Australia was one of only a few countries in which there was not a difference in favour of males (Lokan et al., 1996). The lack of gender differences in mathematics and science achievement observed in 1994 was replicated in the 1999 repeat of the TIMSS study (Martin et al., 2000; Mullis et al., 2000). These results contrasted with those reported from earlier international studies of mathematics and science achievement (Comber & Keeves, 1973; Rosier, 1980; Rosier & Keeves, 1991). The results have been quite reasonably interpreted as evidence of the impact of programs that promoted participation in mathematics and science among girls at school, and of the impact of broader social changes.

Gender differences are also evident for tertiary entrance scores. In New South Wales, females are more frequently found in the top percentiles for university admission (NSW UAC, 1998:10). In the great majority of Year 12 courses in New South Wales, females outperform males and the gap appears to have increased throughout the 1990s (Collins, Kenway, & McLeod, 2000:50,57-60; MacCann, 1995). The Victorian Tertiary Admission Centre (VTAC, 1998-1999:98-99107) reports higher percentages of females in the top percentile bands, with males more common in the lower bands. Collins et al.

(2000:54) also report that females outperform males in the majority of subjects in Victoria. This was also the case for Western Australia (Collins et al., 2000:55). In the Queensland Cores Skills Test (QCS), there were proportionally more males in the very top band, more females in the following high and middle achieving bands, but more males in the lower bands. The trend towards females outperforming males is not limited to the Australian context (Baker & Jones, 1993).

Socioeconomic Background

As a result of a number of large-scale studies conducted at a national and international level there is now consistent evidence of the magnitude of the relationship between socioeconomic background and educational outcomes. Typically, correlation coefficients of approximately 0.3 are reported between socioeconomic status and educational outcomes, such as tertiary entrance performance. In longitudinal studies it is typically found that socioeconomic background operates partly as a direct effect and an indirect effect mediated through its effect on achievement at earlier stages of schooling.

In PISA, achievement was positively associated with student socioeconomic status in all countries but there were differences between countries in the strength of this association[6]. A measure of the strength of this association is provided by the gain in reading literacy associated with a one international standard deviation increase on the index of socioeconomic status. For Australia the size of this measure of the association was 32 scale points, very close to the OECD average of 34 scale points. Among the lowest values was Korea (14 points) and the highest was Germany (45 points). The values for the United Kingdom, the United States, New Zealand and Canada were 38, 34, 32 and 26 points respectively. In terms of the socioeconomic distribution of achievement, Australia is around the international average and not a leader in terms of equality of outcomes (OECD, 2001b). These effects correspond to a correlation of around 0.30. Similar results were reported in the TIMSS studies for mathematics and science among middle primary and junior secondary students (Lokan et al., 1996:40; Lokan, Ford, & Greenwood, 1997:44)[7].

The influence of socioeconomic background on educational outcomes is declining in many OECD countries (Rijken, 1999:51-78; Sieben, 2001:33-55). In Australia, there is evidence that the influence of socioeconomic background on both participation in Year 12 and higher education is declining over-time. (Marks et al., 2000). Analyses of a second time series of longitudinal data indicate that the influence of socioeconomic background on school non-completion is also declining (McMillan & Marks, Forthcoming).

Socioeconomic background is often considered the most important influence on educational outcomes and an important element in the funding of schools. However, its influence is considerably smaller than that of achievement in literacy and achievement (Marks & Fleming, 1998a; Marks et al., 2000; Marks et al., 2001). Both the Australian and international PISA reports demonstrate large variation between students' socioeconomic background and their achievement scores (Lokan et al., 2001:163-168; OECD, 2001b:185). This variation reflects the moderate correlation between socioeconomic background and achievement.

From a policy perspective, it is important to further reduce the impact of socioeconomic background. There are countries where the impact of socioeconomic background is

considerably weaker that it is in Australia. A general rather than streamed curriculum is helpful since school systems characterised by tracking or streaming tend to show stronger effects of socioeconomic background (OECD, 2001b:195-196). Furthermore, there are funding issues. It may not be effective to bloc fund disadvantaged schools on the basis of the socioeconomic status of the schools' students. It may be more effective to focus on the poorer performing students and improve their basic skills. This will indirectly reduce the effect of socioeconomic background, but at the same time focus directly on educational outcomes.

Ethnic and Indigenous Minorities

Although formulas for school funding often include the proportion of non-English speaking students, these students often exhibit superior outcomes in terms of early school leaving, Year 12 participation, tertiary entrance performance and participation in higher education (Marks & Fleming, 1998a; Marks et al., 2000; Marks et al., 2001). Differences in middle-secondary school achievement are often minimal so it appears that 'cultural factors' are responsible for their high performance in the last two years of schools. However, at the primary school level students with language backgrounds other than English tend to show lower mean achievement levels than students with an English language background (Lokan et al., 1997:173-178).

Indigenous students show poorer educational outcomes than non-indigenous students. The difference between Indigenous and non-Indigenous students in the PISA assessments of reading literacy was 0.8 standard deviations[8]. Similar results were found for mathematical and scientific literacy. Around 15 per cent of Indigenous students were at proficiency levels 4 or 5. At this level students are considered to be able to locate information embedded in text, construe meaning of part of a text through considering text as a whole, deal with ambiguities and negatively worded text, show accurate understanding of complex texts and evaluate texts critically.

The rducational participation of Indigenous students is much lower than that of non-indigenous students. In 1997 the Year 8 to Year 12 school retention rate for Indigenous students was 31 per cent compared to 73 per cent for non-Indigenous students (Long, Frigo, & Batten, 1999b:37). In 1996 approximately 11 per cent of non-Indigenous 20 to 24 year-olds held a university degree compared to only 2 per cent of 20 to 24 year-old Indigenous Australians (Long et al., 1999b:76). Similarly, the more select group of Indigenous students who compete for a tertiary entrance score show scores, on average, 11 points lower than non-Indigenous students (Marks et al., 2001). Indigenous students remain the most educationally disadvantaged group of young Australians.

School Sector

Over the past two decades there has been a shift of school enrolments from the government to the non-government sector. In 1984, 75 per cent of school students were enrolled in government schools. By 2000 the percentage of students in government schools was down to 69 per cent (ABS, 2001:34). The most current data shows that the percentage of students in government schools is smaller in the secondary (64 per cent) than the primary years (73 per cent) and smaller again for the final year of secondary school (61 per cent). Across all levels of schooling in 2000, 20 per cent of students were in Catholic schools and 11 per cent were in other non-government schools. For Catholic schools there was little difference in the enrolment share at primary (19 per cent) and

secondary (21 per cent) levels. For other non-government schools the enrolment share for the secondary school years (15 per cent) was almost double that for the primary school years (8 per cent). For the final year of secondary school 22 per cent of students were in Catholic schools and 17 per cent were in other non-government schools.

The shift of enrolments from the government to non-government schools poses a significant challenge to the organisation of schooling in Australia. Schooling in Australia has been assumed to be largely through comprehensive government schools that have a broadly representative intake, with non-government schools providing for a smaller number of students. If the current trend continues government secondary schools may come to be regarded as providing for a little more than half of the student population. The issue is compounded because the shift of enrolments is probably not uniformly spread across the social distribution in the community. Some organisational responses such as, the *Schools of the Future* program in Victoria and *Partnerships 21* in South Australia, have attempted to respond to this challenge by devolving more authority to individual schools and shortening the lines of authority for operational decisions. In these respects government schools would operate like non-government schools. Neither program has operated for a sufficient time for a considered evaluation of their long-term impact.

One of the most dramatic changes in Year 12 participation is the substantial decline in school sector differences. In the early 1980s only 30 per cent of those who had attended government schools participated in Year 12 compared to 44 per cent of Catholic school students and 88 per cent of independent school students. By the late 1990s, 71 per cent of government school students participated in Year 12 whereas the participation rate of independent school students had remained the same. Participation among students from Catholic schools had become almost as high as that of students from independent schools (Marks et al., 2000). School sector differences in non-completion can be partially explained by the socioeconomic and academic mix of students in the different sectors.

School sector has a substantial impact on tertiary entrance performance. On average, students attending independent schools have higher mean *ENTER* scores than students attending Catholic schools, who in turn have higher *ENTER* scores than students attending government schools. Differences in *ENTER* scores between students attending independent and government schools are reduced by nearly 50 per cent after controlling for differences in Year 9 achievement and the socioeconomic backgrounds of students. Differences in *ENTER* scores between students attending Catholic and government schools are reduced by about 20 per cent after controlling for prior achievement and the socioeconomic backgrounds of students. However, there remain differences between school sectors in achievement growth, with growth lower in the government school sector (Marks et al., 2001).

The interpretation of these differences is not clear. It is possible that many independent schools have a more defined focus on university entrance than many government schools and do not need to spread their efforts over such a diverse range of endeavours (including a wide range of vocational courses). In general, research on school effectiveness has pointed to the importance of the academic environment of a school for growth in student performance (see below). The difference between government and independent schools in tertiary entrance performance could be attributed partly to differences in resource levels but that seems less likely to provide an explanation for differences between Catholic and government schools. It is also possible that because of greater flexibility in

recruitment strategies, coupled with the availability of financial resources, non-government schools are able to attract and retain very capable teachers. Rowe (1999) has argued on the basis of data from one state that there are important differences between subject areas within schools and between classes within schools. He interprets this as an indication of important effects of individual teachers.

School Differences in Performance

Most studies of educational outcomes identify differences among schools in average achievement. Those differences are partly associated with differences in the social and academic mix of the student population in each school. The extent to which there are differences among schools indicates the effect of national patterns of school organisation and the effect of differences in the effectiveness of schools. Where school systems are selective, where residential areas are socially stratified, or where schools are differentially effective, between-school differences will be larger. Technically, the extent of these differences can be represented as the percentage of the variation in student achievement that can be explained by the variation in the average achievement for each school. If all the students in each school achieved the same score but there were differences between schools then 100 per cent of the variation in student achievement could be attributed to the school attended. If all students achieved different scores but all the schools had the same average score then none of the variation in student achievement could be attributed to the school attended.

One of the issues investigated in the data from PISA was the extent to which there were variations between schools in student performance (OECD, 2001b:60-67)[9]. This was indicated by the percentage of the variation in student scores that could be attributed to differences between schools and the percentage that could be attributed to differences among students within schools. On average, a little more than one third (36 per cent) of the variance in student achievement was attributable to between-school differences across OECD countries. Belgium, Germany and Austria, each of which have selective school systems, have around 70 per cent of the variance in reading achievement attributable to between-school differences. In Italy, the Czech Republic and Greece the figure is around 50 per cent. At the other end of the scale are Finland, Sweden and Iceland where the percentage of variance attributable to between school differences is less than ten per cent. For Australia, approximately 20 per cent of the variance in reading literacy is associated with differences among schools. This figure is comparable with that for the United Kingdom and New Zealand, lower than the United States (35 per cent) and just a little higher than Canada (OECD, 2001b). In general terms it can be concluded that in Australia efforts to improve student performance need to be directed to less-successful students within schools rather than to improving particular schools.

School Influences on Outcomes

Early literature on school effects concluded that schools had little effect on student outcomes (Coleman et al., 1966; Jencks et al., 1972). It was argued that variations in schools were considerably less important than social background (Coleman, Hoffer, & Kilgore, 1982:xxvi). Many regarded this as disappointing since schools are viewed as important agents of social policy and school inequalities can in principle, be addressed by government initiatives. From the mid-1970s there was resurgence in research on the role of schools in student outcomes. In the late 1970s and early 1980s there emerged a body of research concerned with effective schools that originated in an intention to improve

the achievement outcomes of students in schools located in poor inner-urban areas. These studies sought to identify schools that were "unusually" effective in terms of achievement in reading and mathematics and then to probe, using case study methods or more systematic comparisons, the sources of effectiveness. Over time there emerged knowledge of characteristics of unusually effective schools (Levine, 1992). This area of research has had a further impetus from the mid-1980s with the application of multi-level statistical models that enable separation of school-level effects from individual-level effects. This more recent school effectiveness research concludes that schools can and often do have substantial effects on students' academic performance (Goldstein & Blatchford, 1998). Studies such as PISA, and other cross-sectional surveys, are not really designed to investigate the influence of school factors on learning. Longitudinal data is needed to investigate the influence of school and classroom factors on student learning[10].

Differences between schools are largely the result of differences between schools in the social and academic mix of students. Once such differences are taken into account there is only a minority of schools, in which the school itself is a significant independent influence on student performance. In Australia, only 17 per cent of schools had an independent influence on Year 12 participation after taking into account state or territory, and prior student achievement. This figure declined to 12 per cent after adding school sector to the analysis (Marks et al., 2000). Similarly, only 17 per cent of schools had significant effects on tertiary entrance performance after controlling for student intake (prior achievement and socioeconomic background). After taking into account other student factors this figure declined to 11 per cent (Marks et al., 2001). This means that only in a minority of schools does the individual school increase or decrease student performance to a significant extent, net of other factors.

Although only a minority of schools significantly lift school performance, there has been much research on the characteristics of 'effective' schools. That is schools that lift student performance above what is expected, given the schools' social and academic intake. After reviewing the international literature, Kreft (1993) concluded that more effective schools have: a higher level of parental involvement with the school; higher levels of expectations among students; frequent monitoring of student performance; greater involvement by parents and teachers; an orderly school atmosphere; and strict discipline. In a review of the US research on unusually effective schools, Levine (1992) identified a large number of correlates including mastery of central learning skills, students having a sense of efficacy, school resources and support for teachers. A more recent review of the literature concluded that research on effective schools identifies five factors: strong educational leadership; emphasis on acquiring basic skills; an orderly and secure environment; high expectations of student achievement; and frequent assessment of student progress (Scheerens & Bosker, 1997:146). For tertiary entrance performance, the academic climate of the school was found to be an important factor (Marks et al., 2001).

After performing meta-analyses on factors often understood as important to school effectiveness, the same authors (Scheerens & Bosker, 1997:237-238) conclude that the most powerful factors operate at the classroom level. Hill and Rowe (1996) reached the same conclusion from the analysis of data on student progress through Victorian primary schools. Differences among classrooms within schools were greater than differences among schools. Some of these differences may be partly attributable to the clustering of students of similar abilities in the same classrooms but it does appear evident that

differences between classrooms are important and that it is what individual teachers do that is crucial for student learning.

Despite the general factors that have been identified as characteristics of effective schools, there is little that is specific. It is difficult to conclude which particular factors (and therefore policy initiatives) make for effective schools. Many inter-correlated factors are canvassed as important influences, which may vary between school systems. It may well be that variable-focussed modelling is appropriate for establishing the extent to which schools vary, and for identifying schools that appear to be effective, but case centred forms of analysis (both quantitative and qualitative) are needed to elucidate the ways in which factors cluster to influence outcomes.

Providing additional resources to schools, and reducing class size, are two related and much debated ways of improving educational outcomes. One approach to the investigation of these issues has been through the econometric analyses of education production functions that makes use of the natural variation of class size across schools and models student achievement in relation to class size, controlling for student characteristics and prior achievement. It is crucial to control for prior achievement because in many school systems low-achieving students are often allocated to smaller classes. Greenwald, Hedges and Laine (1996) applied meta-analytic techniques to a series of studies and concluded that increased resources were associated with improved student outcomes. This analysis was important because it differed from the conclusions of Hanushek (1989) who found little or no effects of school resources. However, even though Greenwald et al. (1996) concluded that there was an effect of resources, the magnitude of the effect was not large.

A number of experimental studies of class size and achievement have been reported. Some 20 years ago, Glass and Smith (1979) conducted a meta-analysis of laboratory experiments using instructional groups of different size. They concluded that reduced class size could be expected to produce increased student achievement but that benefits are only evident when the class size is reduced below 20. In the United States policy had been strongly influenced by the results of the Tennessee class-size experiment (Finn & Achilles, 1999). In 79 schools, students and teachers in the Kindergarten year were randomly assigned to different class sizes from Kindergarten through to Grade 3. Small classes contained between 13 and 17 students and large classes contained between 22 and 26 students. There has been a consistent finding that students in the smaller classes showed larger gains in reading and mathematics achievement. The magnitude of the effect in one year has been variously estimated as 0.21 (Word et al., 1994) or 0.15 standard deviations (Goldstein & Blatchford, 1998). As part of a follow up it was concluded that the benefits of the smaller classes lasted through to the later years of primary school but with an attenuated magnitude (Nye, Hedges, & Konstantopoulos, 2001).

Although the results of the Tennessee experiment have provided strong support for the proposition that reduced class size produces enhanced learning outcomes, the conclusions for practice are not unequivocal. Prais (1996) argues that for a given investment alternative actions such as time for teacher professional development, devoting resources to students with learning difficulties, developing better curriculum resources, and varying the time students spend in groups of different size should be seen as better use of resources. The extent to which the results of this study of the early primary years can be generalised to later stages of schooling is untested. In addition, analysis of the costs of

class size reduction programs in the United States have identified issues associated with the cost of physical resources (rooms etc) and maintenance of teacher quality when there is a rapid expansion of teacher numbers (Brewer, Krop, Gill, & Reichardt, 1999). These issues impact on both cost and the effectiveness of class size reduction in school systems.

The provision of additional resources to schools can have beneficial effects but choices need to be made regarding where and how those resources can be applied most effectively.

CONCLUSION

This paper has discussed a wide range of issues concerning Australian education. It's purpose to is provide debates on the policy direction of Australian education with a solid empirical basis. It canvasses broad policy directions for Australian education and the school-to-work transition. It is important that policy debates on these issues continue and that the participants in the debate are motivated by the desire to improve the educational and labour market outcomes of young Australians, while drawing upon the evidence available to inform this debate.

APPENDIX : SUMMARY OF THE DATA

International Studies of Student Achievement Studies

Australia has been a regular participant in international studies of achievement. The most recent of these international studies was the study for the *Organisation for Economic Co-operation and Development* (OECD) titled the *Programme for International Student Assessment* (PISA). PISA is a set of surveys of literacy in reading, mathematics and science among 15-year-olds in a range of industrialised countries. The first cycle of the PISA surveys in 2000 focussed on reading literacy (but also included assessments of mathematical and scientific literacy). It will be repeated in every three years so that changes over time can be monitored (and with shifts in the main focus of the assessments).

In its approach to the assessment of literacy in reading mathematics and science PISA emphasises the ability of young people to apply their knowledge and skill to real life problems and situations rather than how well they have learned specific curriculum material. In this approach literacy means more than the common meaning of being able to read and write. Student scores are reported on a separate standards-referenced scale (five levels are described) in each of the three areas[11]. Approximately 6,200 students from 231 schools in Australia took part in PISA during 2000[12].

Australia participated in the studies of achievement in mathematics and science conducted by the *International Association for the Evaluation of Educational Achievement* (IEA) since the first international study of mathematics achievement in 1964 (12 countries participated). Australia conducted a national survey in 1978 linked to the second international mathematics study. It participated in the first international science study in 1970 (19 countries), the second international science study in 1983-4 (23 countries), the third international mathematics and science study in 1994 (with 41 countries) and the repeat of that study in 1998. It is currently participating in the trends in mathematics and science study in which data will be collected in 2002.

Whereas PISA sampled students in the middle secondary school years (students aged 15 are typically located in Year 10) the successive IEA studies of mathematics and science have sampled three populations: the middle primary years, the junior secondary years and the final year of secondary school. The first two of the studies in mathematics (1964 and 1979) and in science (1970 and 1984) defined populations one and two in terms of age (nine and thirteen years of age respectively). In the third and subsequent studies the populations have been defined in terms of the relevant Year levels. The approach to assessment also differed. Where PISA was concerned with defining skills and knowledge that would be the basis for life-long learning TIMSS based its assessment instruments on an analysis of curricula in participating countries. The tests were constructed to balance representation of content areas (eg fractions, geometry etc) and performance categories (eg knowing, routine procedures, complex procedures and problem solving). The principles behind these two approaches are much discussed but it is unclear what difference is manifest in practice. As for PISA there was a mixture of multiple choice, short answer and extended answer questions. There was an option (in which Australia participated) of a performance assessment based on laboratory exercises.

National Surveys of Transitions among Youth

Australia has had in place for more than 20 years a series of longitudinal surveys of the progress of young people through school, various forms of post-school education and training and into the labour market. These surveys have been known variously as *Youth in Transition* (YIT), the *Australian Youth Survey* (AYS) and the *Longitudinal Surveys of Australian Youth* (LSAY) that has subsumed its two predecessors. One of the important features of these surveys, in comparison to surveys in other countries, is that they begin by collecting information about student proficiency in literacy and numeracy. As part of YIT, samples of approximately 6 000 students were selected in either their late primary or early secondary school years[13]. In the more recent LSAY the samples are much larger consisting of approximately 13 000 students from Year 9 in around 300 schools[14].

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NOTES

1 As a proportion of Gross Domestic Product, public and private expenditure on education in Australia (at 5.46 per cent) is slightly below the OECD mean (5.75 per cent). Similarly, public expenditure on education (as a proportion of GDP) is lower in Australia (4.34 per cent) below the OECD mean (4.64) (OECD, 2001a:80). Public expenditure on tertiary education as a proportion of GDP in Australia (1.09) is slightly above the OECD mean (1.06 per cent) (OECD, 2001a:81). Expenditure per primary and secondary school student in Australia is the same as the OECD mean. Expenditure per tertiary student in Australia is higher than the OECD mean (OECD, 2001a:59).

2 Marginal activities included part-time work (without full-time study), unemployment, and being not in the labour force

3 In this study, graduates were comprised of predominantly university graduates, although a smaller group of TAFE diploma graduates was also included.

4 Reform of university funding is a difficult issue. One argument is that increases in participation should be funded through taxation. Since Australia collects a smaller proportion of GDP in taxation than many other OECD countries, then governments should simply increase taxes. However, there are few taxation options for Australian governments. A top marginal tax rate of 48 per cent starting at $60 000, is a high tax regime. Australia has just emerged from a difficult debate about indirect taxes, so it is very unlikely that the GST will be extended or increased. Many of the European countries, which collect larger proportions of tax, do so because of indirect taxes. Many of the options for increasing tax revenues such as increasing fuel taxes, taxes on the sale of the family home, and death duties, have their own economic, social, and political costs. Furthermore, they may not attract sufficient revenue.

5 A similar decline in apprenticeships was found in the *Youth in Transition* cohorts. The participation rate by age 19 declined from 18 per cent in the early 1980s to 14 per cent in the mid 1990s (Long, Carpenter, & Hayden, 1999a:8). A decline is also evident in a more recent LSAY cohort (who had been in Year 9 in 1995). By 2000 when the modal age of the age was 19, 13 per cent had participated in an apprenticeship.

6 An international index based on parental occupations was used to measure socioeconomic status.

7 The relationship was a little stronger at junior secondary than middle primary level.

8 Based on a sample of nearly 500 indigenous students. A total of 192 students in the main sample identified themselves as of Indigenous origin. The study also included 300 indigenous students from the same schools as the main sample as an additional sample.

9 Within Australia there were relatively few significant differences among jurisdictions (Lokan et al, 2001). In reading literacy the performance of students from the ACT was significantly better than that of students from Queensland, Victoria, Tasmania and the Northern Territory. In mathematical literacy there were few differences among jurisdictions but in scientific literacy both the ACT and Western Australia had higher performance levels than several other states.

10 Notwithstanding this caveat, PISA found that higher amounts of homework (in Australia and many other countries), lower rates of absence from school, a positive discipline climate and pressure to achieve were associated with student performance.

11 The scale was structured so that the international mean was 500 with a standard deviation of 100. Hence, differences in scale scores provide an indication of effect size (by 100).

12 The sample was carefully drawn according to international requirements and the response rate was more than 80 per cent before replacement and more than 90 per cent after replacement (Lokan et al, 2001: 225-231; OECD, 2001: 235).

13 These young people were contacted each year by mail questionnaire to gather information about their educational and labour force activities as well as other aspects of their lives.

14 After the initial contacts through schools these young people are contacted each year with a telephone survey.