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References are in a separate file, AES_2001_References

2. WHY IS EDUCATION REWARDED —NECESSARY SKILLS OR ARBITRARY CREDENTIALISM?

During the twentieth century, educational levels have risen dramatically throughout the developed world.[1] Students, parents, and governments all invest time, energy, and money in education at least in part in order that young people learn the skills needed in the complex jobs typical of modern economies and thus will be able to earn the higher pay that those jobs provide. The best estimates suggest that rewards to an extra year of education in industrial societies are in the order of 5 per cent to 15 per cent.[2]

But how much education do different jobs *actually* require? Do educated people earn higher incomes because they are more productive employees as a result of their education? Or are the rewards to education less to do with productivity and more to do with the acquisition of social credentials?

Competing views about education

Education and training confer skills that enable people to do their jobs better—that is, education enhances productivity—according to sociological functionalists and most economists (Becker 1964; Davis and Moore 1945, Schultz 1980). Assessment of how much reward accrues to productivity in a free market was systematised by Adam Smith 1776[1937]) and nineteenth century liberal economists as "marginal productivity theory". According to this line of reasoning, highly educated workers get higher pay than their less educated peers because they generate more profit for

[1] We thank Michael Harris for his comments.

[2] But note that an exact figure is difficult to estimate and varies among nations, industries, and historical periods (Murphy and Welch 1994; Psacharopoulos 1973).

their firms. In turn, they are rewarded for their contribution with higher pay, which encourages others to invest in education ("human capital").

By contrast, "credentialists" argue that education has no intrinsic effect on productivity; hence that (factually) it is not rewarded for that reason; and hence that (normatively) it provides no legitimate justification for inequality. Moreover, if education is largely irrelevant to productivity, it follows that while education may be privately profitable for individuals, it does not improve standards of living for society.

- The most persuasive version of "strong" credentialism builds on Weber's (1922) concept of status groups, arguing that education is important not because it provides skills but because it indicates membership in a status group which controls access to particular jobs: it is merely a "credential", a cultural marker of class (Bourdieu 1973; Bourdieu and Passeron 1977), one closely analogous to ethnicity (Collins 1971). Credentialists argue that employers use the educational system as a sorting device: education imparts no skills useful in the workplace, but, nonetheless, employers choose to pay more to the highly educated. Bourdieu's argument is more persuasive than other credentialist arguments because it provides a motive for employers to treat the highly educated so well: they reward members of their own group as part of a system of within-group exchanges.

- "Weak" credentialism or "signalling" proposes that employers mainly use education as a screening device or filter to sort job applicants according to their ability and diligence (Spence 1974). When workers are many and jobs are scarce, employers are tempted to screen more selectively than when the economy is growing rapidly. This can push educational standards for jobs far beyond the levels actually required to do the work (Clogg 1979; Clogg, Eliason, and Wahl 1990; Clogg and Sullivan 1983).

The political and ethical implications of both of these views differ greatly from the implications of human capital arguments. If education is purely a marker indicating class, its privileges are illegitimate by most standards. To the extent it provides a non-causal signal about which workers are better, it serves a sorting role (allocating higher-ability workers to more demanding jobs), although that would be a very expensive way to assess ability and diligence.

This analysis tests these competing theories empirically. Both human capital and credentialist theories predict a close correspondence between workers' actual education and their job, differing only in whether this connection is necessary (because the skills provided by education are necessary to do the job well) or not. Assessing how much education is **necessary** to do the work itself is thus the key

issue. We provide an independent assessment from a particularly well-informed source: the workers themselves.

Data

We address these questions with data from the 1995/ 96 and 1996/97 International Social Science Surveys/ Australia, both nationwide simple random samples of Australian citizens, aged 18 and over, drawn from the compulsory electoral register, which closely match the population in all characteristics that can be compared to the census (see the appendix for a full description of the data). The results presented here are for 2372 respondents currently employed full or part-time.

The question

After getting detailed information about respondent's job, we asked:

How much schooling or university would someone usually need to do your job really well—well enough to teach someone else how to do it?

No schooling at all	*7%*	
Year 9 or less	*7%*	
Year 10	*16%*	
Year 11	*6%*	
Year 12	*27%*	
1 year of university	*2%*	
2 years of university	*3%*	
3 years of university	*14%*	
4 years of university	*14%*	
5 years of university	*3%*	
6 years of university	*3%*	
	100%	*(2372 cases)*

All in all, only about 30 per cent of today's workforce thinks 10 years or less of education is adequate for their job—a far cry from the overwhelmingly unskilled jobs of past generations. Few, 6 per cent, think year 11 is enough. But quite a lot, 27 per cent think year 12 is necessary. Work requiring university training is surprisingly widespread: not jobs requiring just a year (2 per cent) or two (3 per cent) of university, but ones requiring a three year Bachelor's course (14 per cent), a four-year degree (14 per cent), or even more (6 per cent).

Thus it seems that Australian workers implicitly agree with a long-standing assumption of government policy: that to keep up with changes in the workplace, Australia needs to become the "clever country". This is far from the kind of skill-free economy credentialists envisage, but very much as human capital theory envisages.

What sort of jobs require education?

The jobs that require a lot of education are, for the most part, not traditional jobs on the land or in factories so common in past decades, but instead the technical, administrative, and professional jobs that are increasingly common in modern economies—very much the sort of complex jobs envisaged by human capital theory (Table 2.1).

o Few farmers or farm labourers think much education is required to do their work: 67 per cent say that early school leavers with only 9 or 10 years of school can do the work. Just 24 per cent say year 12 (secondary school completion) is required and only 8 per cent say a university education is needed.

- Unskilled workers (for example, labourers, porters, unskilled factory workers, waitresses, or janitors) say that early school leavers can do their work, 77 per cent. The rest say that schooling to year 12 is required, and none think more is required.

- Semi-skilled workers (for example, bus drivers, cannery workers, carpenters, metal workers or bakers) also believe that early school leavers can do their work, 70 per cent. Almost all the rest, 29 per cent, say schooling to year 12 is enough.

- Skilled workers (for example, foremen, motor mechanics, printers, seamstresses, electricians, or policeman) have very similar views about their work: 67 per cent think early school leavers can do the job, but 31 per cent say year 12 is needed and a tiny handful, 2 per cent, that university is required.

- Sales workers (sales managers, shop owners, shop assistants, insurance agents and the like) think their work requires a little more education. In their view, 48 per cent of those jobs can be done by early school leavers, but almost as many, 42 per cent, need a year 12 education, and a few, 10 per cent, require a university education.

- Many clerical workers (secretaries, clerks, office managers, civil servants, bookkeepers and such) think their work can be done by early school leavers, 49 per cent. But almost as many think year 12 is necessary. Only a few think university is required, 5 per cent.

- Technical and lower professional workers (for example, nurses, artists, primary school teachers, or laboratory technicians) think their jobs require substantial education. Only a few think early school leavers could do their

jobs, 11 per cent. Around 28 per cent think year 12 education is enough. And fully 61 per cent think a university education is necessary.

- Higher administrators (bankers, executives in big business, high government officials, union officials, and the like) also think their jobs require substantial levels of education. Only 11 per cent think their work could be done by early school leavers, 43 per cent think year 12 suffices and a few more think a university education is required, 46 per cent.

- Finally, higher professionals (doctors, electrical engineers, university scientists, secondary school teachers, lawyers, clergy and the like) are overwhelmingly convinced that university education is necessary to do their jobs: 89 per cent say so.

Table 1
Perceived educational requirements of respondent's job: Percentages. Men and women, age 18 or older, in the labour force. Australia, 1995–1997

	Education required			
Occupation	*11 years or less*	*Secondary (year 12)*	*University*	*Total (cases)*
Farm	67	24	8	100% (95)
Unskilled worker	77	24	0	100% (132)
Semi-skilled	70	29	2	100% (164)
Skilled worker	63	33	4	100% (245)
Sales worker	48	42	10	100% (230)
Clerical	49	47	5	100% (425)
Technical	11	28	61	100% (443)
Administrative	11	43	46	100% (210)
Professional	2	9	89	100% (375)

Do workers have the right amount of education for their jobs?

Comparing workers' actual levels of education to the amount of education they feel is necessary for their jobs shows how much "educational mismatch" there is in the workforce.[3] This can help us find out whether workers have too little skill for the tasks they are set, whether their skills match their jobs reasonably well, or whether their skills are under-utilised. Human capital theory proposes that education

[3] For other measurement strategies, see Clogg (1979); Clogg and Sullivan (1983); Lichter and Landry (1991); Parcel and Mueller (1989).

generates skills that can then be put to good use in the labour market, thus it implies that the skills should be well-matched— with workers neither having too little education (for then they would be unable to do the job) nor having education far beyond that required to do the job (for then either workers would reap no reward to their investment in education or employers would be paying a premium for skill they do not use). By contrast, credentialist theory would expect that the actual educational requirements of better jobs greatly exceeds the "necessary requirements", so mismatch between actual and required education should increase as one climbs the educational ladder.

All in all, skills and task requirements match reasonably well (Table 2.2). The main exception is among those who have completed secondary school (Year 12) who have not gone on to university.

Early school leavers

Among those who left around the end of compulsory schooling—9 or 10 years of school in Australia, as in Britain and most European nations— 61 per cent choose that as the level needed for their jobs. Another 32 per cent are in jobs that they see as requiring completed secondary schooling. Only 8 per cent are in jobs with university-level skill demands. So a substantial majority of early school leavers seem to be in jobs at the appropriate skills level.

Secondary school graduates

Of those who completed secondary schooling (Year 12) but did not proceed to university, just 46 per cent choose that as the right education level for their tasks.

A large minority, 32 per cent, think that incomplete secondary school is all that is needed to do their jobs really well – so they have more education than their job really requires. This suggests that either:

- employers have not yet caught up with the dramatic expansion of secondary education of the past 15 years and so fail to make full use of the skills now available, or

- that secondary school standards for those not bound for university are so low that few additional skills are conferred in the last couple of years of secondary school, or

- that there is a substantial level of credentialism operating in this segment of the job market.

Finally, 22 per cent of secondary school graduates find themselves in jobs where university education would enhance task performance.

The university educated

Employers seem to make full use of the skills of the university educated: just a handful (5 per cent) of the university educated say that their jobs could adequately be done by someone with incomplete secondary education; slightly more (14 per cent) think that Year 12 would be enough; but a huge majority, 81 per cent, think that university education is needed to do their jobs really well. This is entirely consistent with human capital theory and directly contrary to predictions from credentialist theory.

Table 2
Perceived educational requirements of respondent's job by respondent's actual education. Percentages. Men and women, age 18 or older, in the labour force. Australia, 1995–1997

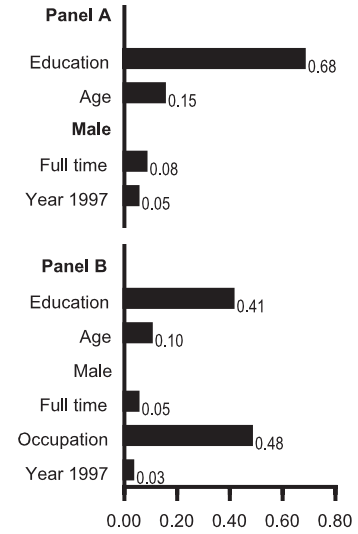
	Education required for respondent's job			
Respondent's education	*11 years or less*	*Secondary (year 12)*	*University*	*Total (cases)*
11 years or less	61	32	8	100% (932)
Secondary (year 12)	32	46	22	100% (743)
University	5	14	81	100% (659)

Regression results: Who gets into jobs that require a lot of education?

Well educated people mostly put their education to good use, getting into jobs that require as much education as they have (Figure 2.1). This is by far the dominant factor, with a massive standardised effect of 0.68. For each additional year of education someone gets, they get a job that requires an additional three-quarters of a year of education, on average.

Figure 2.1

Who gets into jobs that require much education? Panel A: Total effects. Panel B: Direct effects also controlling occupation.



Note: OLS regression estimates predicting how much education respondent's job requires. Men and women, age 18+, in the labour force; N = 2,372. Australia. 1995-1997. Panel A from Eq. 1; panel B from Eq. 2.
Coefficients not shown are not significantly different from zero at p<.01, one-tailed.

About half of this comes about because those with more education get higher status jobs (compare panel A, which gives the total effect of education, and panel B which also controls for occupational status). But the other half the effect is separate from the job's status: it seems that among the jobs on offer at any level of occupational status, the more cognitively challenging jobs attract the more highly educated people.

Compared to those toiling at menial labour, people in high status occupations see their jobs as demanding more education (panel B). The standardised effect is a very large 0.41.

This argues strongly against credentialism in any straightforward sense—to stretch a credentialist argument around this finding would require one to use some very elastic variant of a "false consciousness" argument. More straightforward is the interpretation that people in highly skilled and complex jobs see education as conferring skills that are useful in their tasks.

Other differences are small:

- Older people get into jobs that require a bit more education than otherwise comparable younger people. Everything else equal—including their actual education—someone who is 10 years older will have a job that requires about

0.4 of a year more education. Thus, maturity (or work experience) seems gradually to fit many people for increasingly complex work.

- Interestingly, the jobs men get and the jobs women get do not differ in their educational requirements (see also Rosenfeld 1980).

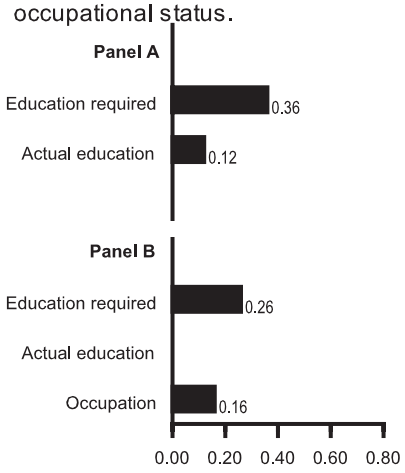
- Full-time workers get into jobs that require about half a year more education than otherwise comparable part-time workers (panel A). About half of this is because the jobs are of higher status (panel B).

Pay: Necessary skills or arbitrary credentialism?

Doing a job that requires a lot of education is well rewarded (Figure 2.2, panel A). The standardised effect is large, 0.36, with each year of required education increasing pay by about 7 per cent.

Figure 2.2

Effects on earnings: doing a job that requires a lot of education is well rewarded but, apart from that, educational credentials pay little or nothing. Panel A: Total effects. Panel B: Direct effect also controlling occupational status.



Note: OLS regression estimates predicting earnings (logged). In panel A, labour force experience, its square, and year of survey are controlled but not shown. From Eq. 3. In panel B, those and occupational experience and its square are also controlled but not shown. Men. age 18+, working full time. N= 1,268. Australia, 1995-1997. From Eq. 4.
Coefficients not shown are not significantly different from zero at p<.01, one-tailed.

Those who are well educated but do not manage to get into a job that requires education for successful performance, get little reward for their educational credentials (panel A). The standardised effect is small, only 0.12, and each year of schooling increases earnings by just 2 per cent. And even this small reward comes

about indirectly: only those who use their educational credential to get a higher status job are rewarded financially (panel B). Apart from that, education does not pay: unless you get into a job that requires education for successful performance, or at least into a high status job, educational credentials bring no reward in the market place.

Conclusion

Both human capital and credentialist theories predict a close correspondence between a worker's education and their job, albeit for very different reasons. Functionalism and human capital theory posit that the education is necessary to do the job, while credentialist arguments claim that it is not. We provide an independent estimate of whether or not education is required to do the work itself from a particularly well-informed source: the workers themselves.

Australian workers have no difficulty telling us how much education is needed to do their jobs well. This would be a nonsense question if education didn't enhance skills, but it is clearly a sensible question to Australian workers. Moreover, the "necessary education" estimates they provide clearly parallel the complexity of the jobs they actually hold. For example, no unskilled workers tell us that good performance on their jobs would require a university education. The story most of them tell is that to do their jobs well one needs at least as much education as they have, particularly among workers in cognitively demanding occupations. The only anomaly here is that a large minority of secondary school graduates who did not go on to university find themselves in jobs requiring only partial secondary school.

The close fit between actual and required education is consistent with functionalism and human capital theory. Further, our analysis reveals that the market agrees, offering little or no reward to educational credentials unless their holders get into jobs that can make effective use of their skills. All in all, our findings strongly support functionalism and human capital theory and run strongly against credentialist arguments. Moreover, the support for the human capital hypothesis provided here, in turn, supports the view that education benefits society via contributions to economic growth as well as enriching the student,[4] that there is a public as well as a private payoff.

Our finding of the productivity-enhancing effect of education also helps explain prior findings that public opinion strongly supports rewards to education (Kelley and Evans 1994), findings that would be very puzzling if the credentialist

[4] Here we have investigated only education's effect on students' labour market prospects. A full account of the benefits of education to students would also need to include consumption benefits of education, that is, the intrinsic delights of higher learning.

hypothesis that education doesn't enhance productivity were true. After all, rewarding people according to their productivity is a venerable and widely supported norm dating back to the origins of Western civilisation (Aristotle, *Nicomachean Ethics,* circa 322BC [1985]:123).

Technical notes

Education required for the job is measured in years, using the question given in the text. Respondent's **actual education** is measured in years of primary, secondary and tertiary education. **Age** is in years. **Male** is scored 1, female zero. **Full-time** workers are those working 35 or more hours a week. Potential **labour force experience** is measured as (age – education – 6). **Occupational experience** is measured in years by a direct question. **Earnings** is the natural log of annual earnings. Models are estimated by ordinary least squares regression. Missing data are treated by the pairwise present method. Details are in the Appendix.

The equations estimated are for Figure 2.1, panels A and B:

$$EducationRequired = b_0 + b_1 Male + b_2 Education + b_3 Age + b_4 FullTime + b_5 YearSurveyed + e_1 \quad (Eq.\ 1)$$

$$EducationRequired = (Eq.\ 1) + b_6 OccupationalStatus + e_2 \quad (Eq.\ 2)$$

Results in Figure 2.2 are for men. For panels A and B:

$$LogEarnings = b_0 + b_1 EducationRequired + b_2 Education + b_3 Experience + b_4 ExperienceRequired + b_5 YearSurveyed + e_3 \quad (Eq.\ 3)$$

$$LogEarnings = (Eq.\ 3) + b_6 OccupationalStatus + b_7 OccupationalExperience + b_8 OccupationalExperienceSquared + e_4 \quad (Eq.\ 4)$$