

Table A2 : 1971 AUSTRALIAN LABOUR FORCE - OCCUPATION X HIGHEST QUALIFICATION OBTAINED

IMPACT Major Occupation Group	Post-secondary Qualifications Held								Nos. Employed in Each Occupation	Proportion of Employed Workforce
	None	Trade	Technician	Diploma	Bachelor Degree	Higher Degree	Not Classified	Total		
1. Professional White Collar	.68	.01	.04	.32	.46	.08	.01	1.00	193294	.04
2. Skilled White Collar	.48	.12	.16	.18	.03	-	.03	1.00	665824	.13
3. Semi and Unskilled White Collar	.85	.03	.03	.02	.01	-	.06	1.00	1352324	.25
4. Skilled Blue Collar - Metal & Electrical	.39	.54	.06	.01	-	-	-	1.00	505563	.09
5. Skilled Blue Collar - Building	.41	.57	.02	-	-	-	-	1.00	211884	.04
6. Skilled Blue Collar - Other	.64	.34	.01	-	-	-	.01	1.00	133327	.03
7. Semi and Unskilled Blue Collar	.87	.11	.01	-	-	-	.01	1.00	1468387	.28
8. Rural Workers	.91	.04	.03	.01	-	-	.01	1.00	403906	.08
9. Armed Services	.66	.21	.06	.03	.02	-	.02	1.00	65196	.01
10. Other (n.e.c.)	.88	.07	.02	.01	.01	-	.01	1.00	240570	.05
Total Employed Workforce	.72	.14	.04	.04	.03	(.003)	.03	1.00	5240275	1.00
Total Population 15 Years and Over	.80	.10	.03	.03	.02	(.003)	.02	1.00	9085582	n.a.

SOURCE:- 1971 Census of Population and Housing.



A Commonwealth Government inter-agency project in co-operation with the University of Melbourne, to facilitate the analysis of the impact of economic demographic and social changes on the structure of the Australian economy

## IMPACT PROJECT



SOME COMMENTS ON THE ABS OCCUPATIONAL CLASSIFICATION SYSTEM AND THE IMPACT OCCUPATIONAL GROUPING

by

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Industries Assistance Commission

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*The views expressed in this paper do not necessarily reflect the opinions of the participating agencies, nor of the Commonwealth government.*

Appendix 6 : QUALIFICATIONS HELD BY EMPLOYED PERSONS  
IN IMPACT MAJOR OCCUPATION GROUPS (1971)

The attached table shows the distribution of highest post-secondary qualifications obtained in each of the IMPACT major occupation groups. The proportions of employed persons that do not hold any post-secondary qualifications appear to be quite high for some of the skilled occupation groups. These proportions should not in all cases be taken as accurate indicators of the absolute or relative degree of heterogeneity of the IMPACT occupation groups however. As mentioned throughout this paper, entry into many occupations, particularly the skilled blue collar occupations, through on-the-job training was quite prevalent in the past.

Table A1 : AMALGAMATION OF IMPACT MINOR GROUPS  
USED FOR SPECIAL TABULATIONS

Amalgamated Group	IMPACT Minor Groups
1. Professionals	1. Scientists, 2. Engineers, 3. Medical, 4. Societal
2. Teachers	5. Tertiary Teachers, 6. Secondary Teachers, 7. Technical Teachers, 8. Primary Teachers
3. Technicians	10. Technicians
4. Para-medical and Creative	9. Para-medical, 11. Creative
5. Government	12. Government
6. Employers	13. Employers
7. Clerical	14. Clerical
8. Sales	15. Sales
9. Other Semi and Unskilled White Collar	16. Semi-skilled Medical, 17. Audio Visual
10. Metal Trades	18. Metal Trades
11. Electrical Trades	19. Electrical Trades
12. Instrument Trades	20. Instrument Trades
13. Building Trades	21. Wood Trades, 22. Brick, etc., Trades, 23. Painter
14. Other Trades	24. Food Trades, 25. Textile Trades, 26. Printing Trades
15. Semi-skilled Metal & Electrical	27. Semi-skilled Metal & Electrical
16. Building	28. Building
17. Miners	29. Miners
18. Drivers	30. Drivers
19. Protective Services	31. Protective Services
20. Production and Process	32. Production and Process
21. Services	33. Services
22. Labourers	34. Labourers
23. Farmers	35. Farmers
24. Farm Workers	36. Farm Workers
25. Officers	37. Officers
26. Other Ranks	38. Other Ranks
27. Other (nec)	39. Other (nec)

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Appendix 5 : AMALGAMATION OF IMPACT MINOR OCCUPATION  
GROUPS USED TO CLASSIFY ABS SURVEY DATA SUPPLIED  
TO IMPACT IN THE FORM OF SPECIAL TABULATIONS

For much of the data supplied to the IMPACT Project by the ABS in the form of special tabulations from the Labour Force Surveys and other supplementary surveys, it was not possible to classify such data by all of the 39 IMPACT minor occupation groups. This is partly a consequence of the small sample size used for these surveys which meant that reliable estimates could not be supplied for all 39 groups (cross-classified by other variables). Thus some of the "smaller" IMPACT minor occupation groups had to be amalgamated. In addition the various IMPACT minor groups for teachers could not be identified in the survey data - all teachers, regardless of qualifications held or the type of teaching institution, were allocated to the one occupation category.

This latter point means, of course, that in this context, the two IMPACT major groups Professional White Collar and Skilled White Collar cannot be obtained by the simple aggregation of these new amalgamated groups since each is partly composed of two of the four IMPACT minor groups for teachers. The amalgamation procedure set out below was used to classify the special tabulations that were supplied by the ABS from the Labour Force Surveys, Income Distribution Surveys, Labour Mobility Surveys and Earnings and Hours Surveys.

7. SEMI-SKILLED AND UNSKILLED BLUE COLLAR		1468387
27	Semi-skilled Metal and Electrical	200055 (.14)
28	Building	68633 (.05)
29	Miners	33887 (.02)
30	Drivers	356167 (.24)
31	Protective Services	41498 (.03)
32	Production and Process	277711 (.19)
33	Services	285171 (.19)
34	Labourers	205265 (.14)
8. RURAL WORKERS		403906
35	Farmers	246452 (.61)
36	Farm Workers	157454 (.39)
9. ARMED SERVICES		65196
37	Officers	7059 (.11)
38	Other Ranks	58137 (.89)
10. OTHER (n.e.c.)		240570
39	Other (nec)	240570 (1.00)
TOTAL EMPLOYED		5240275
UNEMPLOYED		90211
TOTAL WORKFORCE		5330486

Notes: (a) Figures in brackets are the proportions of workers aged 15 years and over employed in the relevant IMPACT major occupation group accounted for by each minor occupation group.

Source: 1971 Census of Population and Housing (unpublished data).

SOME COMMENTS ON THE ABS OCCUPATIONAL  
CLASSIFICATION SYSTEM AND THE IMPACT  
OCCUPATIONAL GROUPING

by

Rowen Craigie\*

1. INTRODUCTION

A principal area of research in BACHURRO, the demographic-labour supply model of the IMPACT Project, concerns the modelling of occupationally disaggregated labour supply.<sup>1</sup> This includes various labour market analyses such as occupational mobility, immigration, the relationships between occupational supplies and different types of training through the education systems, and variations in the number of hours worked across occupations. The demand for labour, also disaggregated by occupation, is projected, under various economic scenarios, in the industry structure model (ORANI) of IMPACT.<sup>2</sup>

\* The author wishes to thank Dean Parham for his many valuable contributions and also Tony Lawson and Alan Powell for their comments and suggestions.

1. For an outline of BACHURRO, see Alan A. Powell, The IMPACT Project: An Overview, First Progress Report of the IMPACT Project, Vol. 1, AGPS, Canberra, 1977.
2. The ORANI module is described in Peter B. Dixon, B. R. Parmenter, G. J. Ryland and John Sutton, ORANI, a General Equilibrium Model of the Australian Economy: Current Specification and Illustrations of Use for Policy Analysis, First Progress Report of the IMPACT Project, Vol. 2, AGPS, Canberra, 1977.

Given this focus on occupational disaggregation, the classification system chosen as a basis for the delineation of occupation categories (within the limits permitted by the available data) assumes considerable importance.

The occupational classification system that has been used by the Australian Bureau of Statistics (ABS) since 1961 is designed primarily for the purpose of classifying the various occupation descriptions recorded on the Population Census schedules.<sup>1</sup> However, this same classification system is used in the ABS surveys conducted on the Population Survey framework (e.g., the Labour Force Surveys and supplementary surveys such as the Labour Mobility and Income Distribution Surveys).

The system is composed of a hierarchy of four levels - major occupation groups, minor occupation groups, occupation codes and the various occupation descriptions covered by each code. A listing of this classification is given in the ABS publication Classification and Classified List of Occupations.<sup>2</sup> This paper focuses attention on the 1971 version of this ABS occupational classification system (used for the 1971 Population Census), which consists of 11 major groups, 72 minor groups and 367 codes - see Appendix 1 for a listing of these ABS major and minor occupation groups. Some very minor revisions to the 1971 version were made for the 1976 Population Census.<sup>3</sup>

1. Minor revisions have been made to this system for each five yearly Population Census undertaken subsequent to 1961.
2. Australian Bureau of Statistics, Classification and Classified List of Occupations, June 1971, Commonwealth Government Printer, Canberra, 1971.
3. Specifically for the 1976 Census, ABS expanded the number of occupation codes by 28 and added an additional minor group for some blue collar occupations that were not elsewhere classified (nec). The titles of the 11 major groups and the 72 minor groups (used in the 1971 Census) remained unchanged, as did in general, their composition. ABS commenced using this 1976 version of their occupational classification system in their published Labour Force Surveys (monthly) from the August 1978 issue.

Appendix 4 : NUMBERS OF EMPLOYED PERSONS IN THE IMPACT OCCUPATION GROUPS (1971)

<u>IMPACT OCCUPATION GROUP</u>		<u>NUMBER EMPLOYED IN 1971 (a)</u>
1. PROFESSIONAL WHITE COLLAR		
1	Scientists	15390 (.08)
2	Engineers	20479 (.11)
3	Medical	28266 (.15)
4	Societal	54923 (.28)
5	Tertiary Teachers	15684 (.08)
6	Secondary Teachers	58552 (.30)
2. SKILLED WHITE COLLAR		
7	Technical Teachers	5743 (.01)
8	Primary Teachers	75558 (.11)
9	Para-medical	62344 (.09)
10	Technicians	127038 (.19)
11	Creative	46269 (.07)
12	Government	11912 (.02)
13	Employers	336960 (.51)
3. SEMI-SKILLED AND UNSKILLED WHITE COLLAR		
14	Clerical	857430 (.63)
15	Sales	421886 (.31)
16	Semi-skilled Medical	65713 (.05)
17	Audio Visual	7295 (.01)
4. SKILLED BLUE COLLAR, METAL AND ELECTRICAL		
18	Metal Trades	360184 (.71)
19	Electrical Trades	128708 (.25)
20	Instrument Trades	16671 (.04)
5. SKILLED BLUE COLLAR, BUILDING		
21	Wood Trades	98066 (.46)
22	Brick, Stone and Glass Trades	63583 (.30)
23	Painter	50235 (.24)
6. SKILLED BLUE COLLAR, OTHER		
24	Food Trades	85395 (.64)
25	Textile Trades	30621 (.23)
26	Printing Trades	17311 (.13)

IMPACT MINOR GROUPS	ABS OCCUPATION CODES - 1971 CENSUS (a)
27. Semi-skilled Metal and Electrical	627, 628, 631, 649, 659, 669, (b) 670-674, 757-763
28. Building	677, 681-685, 697, 698
29. Miners	400-411, 420, 421, 425
30. Drivers	505, 515-517, 520-524, 530, 535-540 555-557, 560-562, 766-768
31. Protective Services	800-802
32. Production and Process	600, 601, 604-606, 611-613, 615-617, 622, 623, 704, 705, 708, 711, (c) 712-716, 720, 722, 723, 725-728, 735-737, 739, 743-750, 754
33. Services	805, 806, 808-811, 815, 816, 820, 821, 825, 830, (d) 835, 845, 850, 852 772, 774-785
34. Labourers	772, 774-785
35. Farmers	300-316
36. Farm Workers	320-335, 340, 345, 346, 355, 356
37. Officers	855, 857, 859, 861
38. Other Ranks	856, 858, 860, 862
39. Other (n.e.c.)	865

- Notes:
- (a) For a listing of these ABS occupation codes and details of the various occupation descriptions they cover see ABS, Classification and Classified List of Occupations, June 1971, Commonwealth Government Printer, Canberra, 1971.
- (b) In McIntosh, op.cit., ABS code 669 was erroneously listed as being in IMPACT minor group 19. Electrical Trades.
- (c) In McIntosh, op.cit., ABS code 711 was erroneously listed as being in IMPACT minor group 22. Brick, Stone and Glass Trades.
- (d) In McIntosh, op.cit., ABS code 830 was erroneously excluded.

There are a number of problems with the design of the ABS occupational classification when viewed in terms of the type of labour market analyses undertaken for IMPACT. These problems stem from the mixture of conflicting criteria used to define the ABS occupation categories. Some of the ABS occupation groups and codes are defined on an industry basis, some by the nature of the work performed, some on the basis of qualifications obtained, some on the basis of skill and some according to the level in an organizational hierarchy. In summary, both the major and minor occupation groups and the occupation codes of the ABS occupational classification are not homogeneous with respect to any single factor.<sup>1</sup>

Most of the data pertaining to the Australian labour market in use in the development stage of the IMPACT models are derived from ABS surveys and the Population Censuses which utilize the ABS occupational classification system. Therefore in the light of misgivings about the design of this system, it was considered desirable to formulate an alternative classification based on consistent criteria which more closely reflected IMPACT's requirements.

Specifically, an occupational classification was required that distinguished firstly, between levels of skill and secondly, between different areas of skill specialization. Adopting this criterion of skill differentiation, M. K. McIntosh regrouped the 367 ABS occupation codes to form the 10 IMPACT major occupation groups and 39 IMPACT minor occupation groups that are listed in Appendix 2 of this paper.<sup>2</sup> (It is not viable to alter the design

1. For further discussion of this criticism of the ABS occupational classification, see Patrick McDonnell, F. Lancaster Jones and Paul Duncan-Jones, "Notes on the Australian Occupational Classification as a Social Science Research Tool," Australian Journal of Statistics, 20(2), 1978, pp. 136-142.

2. See M. K. McIntosh, "The Occupational Grouping for IMPACT," Appendix 1 of J. A. Naphthal, M. K. McIntosh and Lynne S. Williams, "A Cross-sectional Analysis of Inter-Occupational Mobility in Australia," IMPACT Working Paper No. B-06, Industries Assistance Commission, Melbourne, February 1978.

of the ABS occupation codes, since the occupation code is the most disaggregated level at which data are stored - it is only possible to group these codes in some alternate manner).<sup>1</sup>

This paper is divided into four sections. The first section discusses different criteria that could be used to formulate an occupational classification system and explains IMPACT's need for a system based on skill differentiation. The second section examines some features of the design of the ABS occupation codes and the problems these pose for the formation of the skill differentiated occupation categories of the IMPACT occupational grouping. The third section is a critique of the regrouping of these codes into the 39 IMPACT minor occupation groups and the final section discusses some problems with the composition of the 10 IMPACT major occupation groups.

1. The IMPACT occupation groups were formed by regrouping the ABS occupation codes used for the 1971 Census. For the 1976 Census the ABS created some new occupation codes and abolished a few others (see footnote 3 on page 2). The consequence of this is that it is not possible to recreate exactly all of the IMPACT minor and major occupation groups by regrouping the 1976 Census occupation codes. This obviously will affect the comparability of the two sets of Census data and the continuity of any ABS survey data series that are classified according to the IMPACT occupational grouping. The implications of this for IMPACT's labour market analyses and the possible solutions to this problem are currently under review.

Appendix 3 : REGROUPING OF ABS OCCUPATION CODES TO FORM  
THE IMPACT MINOR OCCUPATION GROUPS

IMPACT MINOR GROUPS	ABS OCCUPATION CODES - 1971 CENSUS (a)
1. Scientists	13-17, 20-22
2. Engineers	1-10, 500, 501
3. Medical	25, 26, 35, 36
4. Societal	64, 82-87, 91
5. Tertiary Teachers	41-49
6. Secondary Teachers	53, 54, 58, 59
7. Technical Teachers	50-52
8. Primary Teachers	55-57
9. Para-medical	30-32, 37-40
10. Technicians	70-81, 88, 89, 510
11. Creative	62, 63, 65-68, 90
12. Government	100-106
13. Employers	110-119
14. Clerical	150, 155, 160-163, 545-547
15. Sales	200, 201, 205, 210-217
16. Semi-skilled Medical	33, 34, 851
17. Audio Visual	548, 549, 668, 840
18. Metal Trades	629, 630, 642-648, 650-658
19. Electrical Trades	660-667
20. Instrument Trades	636-640
21. Wood Trades	675, 676, 678-680
22. Brick, Stone and Glass Trades	691-696
23. Painter	687, 688
24. Food Trades	721, 724, 807
25. Textile Trades	602, 603, 609, 610, 614, 621
26. Printing Trades	703, 706, 707



Appendix 2 : IMPACT OCCUPATIONAL GROUPINGMAJOR GROUPS

1. Professional White Collar
2. Skilled White Collar
3. Semi-skilled and Unskilled White Collar
4. Skilled Blue Collar, Metal and Electrical
5. Skilled Blue Collar, Building
6. Skilled Blue Collar, Other
7. Semi-skilled and Unskilled Blue Collar
8. Rural Workers
9. Armed Services
10. Other (nec)

MINOR GROUPS

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. PROFESSIONAL WHITE COLLAR</li> <li>1 Scientists</li> <li>2 Engineers</li> <li>3 Medical</li> <li>4 Societal</li> <li>5 Tertiary Teachers</li> <li>6 Secondary Teachers</li> </ol>                           | <ol style="list-style-type: none"> <li>7. SEMI-SKILLED AND UNSKILLED BLUE COLLAR</li> <li>24 Food Trades</li> <li>25 Textile Trades</li> <li>26 Printing Trades</li> </ol> |
| <ol style="list-style-type: none"> <li>2. SKILLED WHITE COLLAR</li> <li>7 Technical Teachers</li> <li>8 Primary Teachers</li> <li>9 Para-medical</li> <li>10 Technicians</li> <li>11 Creative</li> <li>12 Government</li> <li>13 Employers</li> </ol> | <ol style="list-style-type: none"> <li>8. RURAL WORKERS</li> <li>35 Farmers</li> <li>36 Farm Workers</li> </ol>  |
| <ol style="list-style-type: none"> <li>3. SEMI-SKILLED AND UNSKILLED WHITE COLLAR</li> <li>14 Clerical</li> <li>15 Sales</li> <li>16 Semi-skilled Medical</li> <li>17 Audio Visual</li> </ol>   | <ol style="list-style-type: none"> <li>9. ARMED SERVICES</li> <li>37 Officers</li> <li>38 Other Ranks</li> </ol>   |
| <ol style="list-style-type: none"> <li>4. SKILLED BLUE COLLAR, METAL AND ELECTRICAL</li> <li>18 Metal Trades</li> <li>19 Electrical Trades</li> <li>20 Instrument Trades</li> </ol>   | <ol style="list-style-type: none"> <li>10. OTHER (NEC)</li> <li>39 Other (nec)</li> </ol>  |
| <ol style="list-style-type: none"> <li>5. SKILLED BLUE COLLAR, BUILDING</li> <li>21 Wood Trades</li> <li>22 Brick, Stone and Glass Trades</li> <li>23 Painter</li> </ol>  |  |

2. PRINCIPLES UNDERLYING AN OCCUPATIONAL CLASSIFICATION SYSTEM - IMPACT REQUIREMENTS

There are obviously many principles or criteria upon which an occupational classification can be based, e.g., industry, type of activity performed, type of skill, qualifications, level in a hierarchy, type of materials handled, socio-economic status, etc.. The most appropriate criterion to adopt as the basis of an occupational classification system is clearly a function of the particular labour force studies to which the classification system is likely to be applied. Thus in studies concerned with the social stratification of the labour force for example, it would be preferable to have an occupational classification based on socio-economic status with each occupation category being ranked according to some socio-economic index. On the other hand, for studies of say, the organizational structure of the labour force (maybe within firms), it would be preferable to have an occupational classification that delineated levels in a hierarchy.

However, the type of labour market analyses with which IMPACT is concerned requires that an occupational classification be based primarily on the principle of skill differentiation. This requirement arises from the implications for many of Australia's economic and social policies of the imperfect transformation possibilities (supply side) that characterize the labour force, i.e., the limited extent to which individuals can transform their labour from one type of job to another (e.g., electrician to accountant). Manpower planning, educational planning, immigration policies and various structural adjustment policies are all concerned with the ability of the labour force to adapt through occupational transformation to changing patterns of labour demand.

Hence it is precisely these transformation possibilities that should define the various occupation categories for any labour market

analyses concerned with matters such as structural change, the relationship between occupational supplies and education, labour mobility, etc.. Specifically, the occupational classification should be such that the transformation possibilities are high within categories and low between categories (i.e., the principle of homogeneity within categories, and heterogeneity between categories).<sup>1</sup>

Clearly, the critical factor determining the transformation possibilities between occupations are the level and type of skill required in each occupation. It is obviously easier for an individual to change jobs if the new job has similar skill requirements to the previous job - irrespective of whether such a shift involves a change of industry, a change in the type of activity performed or a change in the type of materials handled -- compared to a job change that necessitates the acquisition of new skills. The latter would most likely require substantial formal or on-the-job training. Thus, from IMPACT's viewpoint, it is desirable that an occupational classification be based primarily on the principle of skill differentiation in preference to any of the other criteria mentioned above.<sup>2</sup>

Operationally, this requires that within each main occupation category there should be homogeneity with respect to skill level and that between categories "upward" mobility without substantial retraining should

1. Note that it is the transformation possibilities (labour supply side) that are of primary concern from a policy analysis viewpoint (and hence should define the occupation categories) and not the substitution possibilities (labour demand side). Any long-run policy initiatives designed to correct any imbalance existing between the various types of labour demanded and labour supplied should sensibly take place on the supply side. That is, manpower policies, education policies and immigration policies (which operate on the supply side) are the appropriate instruments to correct occupational disequilibrium, rather than attempts to interfere with the composition of the production of goods and services (and hence labour demands) so as to match existing or expected labour supplies.

2. It should be noted in particular that the classification of occupations along industry lines to form occupation categories (e.g., the ABS major occupation group "Workers in Transport and Communication") is meaningless in the context of manpower policy analyses which focus on the supply of various types of skills.

## 11: OCCUPATION INADEQUATELY DESCRIBED OR NOT STATED

### 11A Occupation Inadequately Described or Not Stated

Note: Each ABS minor occupation group consists of a number of occupation codes. In the 1971 classification there were 367 such codes. Each code covers a list of occupation descriptions. A full listing of the occupation codes and the occupation descriptions they cover is given in the ABS publication, Classification and Classified List of Occupations, June 1971.

## 6: WORKERS IN TRANSPORT AND COMMUNICATION (Continued)

6D Drivers and Firemen, Rail Transport  
 6E Drivers, Road Transport  
 6F Guards and Conductors, Railway  
 6G Inspectors, Supervisors, Traffic Controllers and Dispatchers, Transport  
 6H Telephone, Telegraph and Related Telecommunication Operators  
 6I Postmasters, Postmen and Messengers  
 6J Workers in Transport and Communication, n.e.c.

## 7/8: TRADESMEN, PRODUCTION-PROCESS WORKERS AND LABOURERS, N.E.C.

7/8A Spinners, Weavers, Knitters, Dyers and Related Workers  
 7/8B Tailors, Cutters, Furriers and Related Workers  
 7/8C Leather Cutters, Lasters, Sewers (except Gloves and Garments) and Related Workers  
 7/8D Furnacemen, Rollers, Drawers, Moulders and Related Metal Making and Treating Workers  
 7/8E Precision Instrument Makers, Watchmakers, Jewellers and Related Workers  
 7/8F Toolmakers, Metal Machinists, Mechanics, Plumbers and Related Metal Workers  
 7/8G Electricians and Related Electrical and Electronic Workers  
 7/8H Metal Workers, Metal and Electrical Production-Process Workers, n.e.c.  
 7/8I Carpenters, Woodworking Machinists, Cabinetmakers and Related Workers  
 7/8J Painters and Decorators  
 7/8K Bricklayers, Plasterers and Construction Workers, n.e.c.  
 7/8L Compositors, Printing Machinists, Engravers, Bookbinders and Related Workers  
 7/8M Potters, Kilnmen, Glass and Clay Formers and Related Workers  
 7/8N Millers, Bakers, Butchers, Brewers and Related Food and Drink Workers  
 7/8O Chemical, Sugar and Paper Production-Process Workers  
 7/8P Tobacco Preparers and Tobacco Product Makers  
 7/8Q Paper Products, Rubber, Plastic and Production-Process Workers, n.e.c.  
 7/8R Packers, Wrappers, Labelers  
 7/8S Stationary Engine, Excavating and Lifting Equipment Operators  
 7/8T Storemen and Freight Handlers  
 7/8U Labourers, n.e.c.

## 9: SERVICE, SPORT AND RECREATION WORKERS

9A Fire Brigade, Police and Other Protective Service Workers  
 9B Housekeepers, Cooks, Maids and Related Workers  
 9C Waiters, Bartenders  
 9D Caretakers, Cleaners, Building  
 9E Barbers, Hairdressers and Beauticians  
 9F Launderers, Dry Cleaners and Pressers  
 9G Athletes, Sportsmen and Related Workers  
 9H Photographers and Camera Operators  
 9I Undertakers and Crematorium Workers  
 9J Service, Sport, Recreation Workers, n.e.c.

## 10: MEMBERS OF ARMED SERVICES

10A Members of Armed Services

be at a minimum. The conceptual basis for assessing the skill level of a particular occupation should be the nature and length of training (either formal or on-the-job) required for an individual to undertake the job in question. In practice, however, in the assessment of the level of skill inherent in a particular occupation description (e.g., doctor, plumber, typist), only formal training requirements can be measured with a reasonable degree of accuracy. Thus, for example, the occupations "accountant" and "electrician" should be classified as occupations involving a high level of skill since significant formal training is required for those entering these occupations through the education systems.<sup>1</sup> As such, the holding of formal qualifications by workers in an occupation will tend to be associated with the assessment that those occupations have a significant skill content. This is not to say that the majority of workers in a highly skilled occupation necessarily need hold formal qualifications. It is conceivable that a majority of such workers undertook only on-the-job training (perhaps entering the occupation at a time when the emphasis on formal qualification requirements was low).<sup>2</sup> If, however, there now exists substantial formal training

1. In the case of an accountant a full-time three year tertiary course or equivalent leads to the award of a diploma or degree and in the case of an electrician a four year apprenticeship leads to a trade certificate or equivalent qualification.

2. Thus, for example, while institutional barriers to entry to certain professional occupations ensure that almost 100% of workers in those occupations hold degrees (e.g., doctors), only about 70% of fitters and turners and 70% of plumbers hold trade qualifications according to (unpublished) data from the 1971 Census. It should be noted that apprentices (not yet qualified) are coded to the appropriate trade (e.g., plumber) in the Census. However of persons actually employed as skilled tradesmen (i.e., excluding apprentices) the proportion who are unqualified is still significant. For some trades the proportion is as high as 27%. See ABS, Apprentices and Employees Working as Tradesmen, September 1977 (Catalogue No. 6235.0)].

requirements for entrants (via the education system) to such an occupation, then that occupation should be assessed as involving a high skill content.

Within any main occupational category delineated on the basis of skill levels, different areas of skill specialisation related to, say, the type of activity performed or type of materials handled, can be identified and these can be used to form the various sub-categories of the classification system. However, all such sub-categories within a main occupation category should have a comparable level of skill, irrespective of the area of specialisation (e.g., "electricians" and "plumbers" could form two sub-categories of the main category "skilled blue collar").

Not surprisingly, the mixture of criteria underlying the ABS classification has resulted in many of the ABS major and minor occupation groups being highly heterogeneous (internally) with respect to skill level. The IMPACT occupational grouping is an attempt to regroup the ABS occupation codes to form new major and minor occupation groups delineated on the basis of skill level and skill specialisation, respectively.<sup>1</sup> However, the design of the ABS occupation codes is such that, like the ABS occupation groups, many codes exhibit internal skill heterogeneity.<sup>2</sup> Obviously this factor has important implications for the skill composition of the IMPACT occupation groups. This point is taken up in the following section.

1. The development of a skill based classification of occupations was, in fact, one of the specific recommendations of Working Group No. 2 which examined for the Crawford study the "adequacy of information systems supporting industry and employment policies in Australia". See Commonwealth of Australia, Report of Working Group No. 2, Study Group on Structural Adjustment (J.G. Crawford, Chairman), Canberra, 1979, p.123. The ineffectiveness of the present ABS occupational classification for labour market analyses concerned with the demand for and supply of skilled labour is also discussed in the article by Peter Scherer, "A Critical Guide to Australian Labour Statistics", in Australian Bulletin of Labour, Supplement No.1, June 1978, pp.19-20.

2. It was not possible to alter the structure of the ABS occupation codes. See pages 3-4.

Appendix 1 : ABS OCCUPATIONAL CLASSIFICATION -  
MAJOR AND MINOR OCCUPATION GROUPS

ABS Major and Minor Occupation Groups (1971 Census)

0: PROFESSIONAL, TECHNICAL AND RELATED WORKERS

- OA Architects, Engineers and Surveyors, Professional
- OB Chemists, Physicists, Geologists and Other Physical Scientists
- OC Biologists, Veterinarians, Agronomists and Related Scientists
- OD Medical Practitioners and Dentists
- OE Nurses, including Probationers or Trainees
- OF Professional Medical Workers, n.e.c.
- OG Teachers
- OH Clergy and Related Members of Religious Orders
- OI Law Professionals
- OJ Artists, Entertainers, Writers and Related Workers
- OK Draftsmen and Technicians, n.e.c.
- OL Other Professional, Technical and Related Workers

1: ADMINISTRATIVE, EXECUTIVE AND MANAGERIAL WORKERS

- 1A Administrative and Executive Officials, Government, n.e.c.
- 1B Employers, Workers on Own Account, Status 0, Directors, Managers, n.e.c.

2: CLERICAL WORKERS

- 2A Book-keepers and Cashiers
- 2B Stenographers and Typists
- 2C Other Clerical Workers

3: SALES WORKERS

- 3A Insurance, Real Estate Salesmen, Auctioneers and Valuers
- 3B Commercial Travellers and Manufacturers Agents
- 3C Proprietors and Shopkeepers, Workers on Own Account, n.e.c., Status 0, Retail and Wholesale Trade, Salesmen, Shop Assistants and Related Workers

4: FARMERS, FISHERMEN, HUNTERS, TIMBER GETTERS AND RELATED WORKERS

- 4A Farmers and Farm Managers
- 4B Farm Workers, including Farm Foremen
- 4C Wool Classers
- 4D Hunters and Trappers
- 4E Fishermen and Related Workers
- 4F Timber Getters and Other Forestry Workers

5: MINERS, QUARRYMEN AND RELATED WORKERS

- 5A Miners, Mineral Prospectors and Quarrymen
- 5B Well Drillers, Oil, Water and Related Workers
- 5C Mineral Treaters

6: WORKERS IN TRANSPORT AND COMMUNICATION

- 6A Deck and Engineer Officers, Ship, not Services
- 6B Deck and Engine Room Hands, Ship and Boatmen, not Services
- 6C Aircraft Pilots, Navigators and Flight Engineers, not Services

6. CONCLUSION

The IMPACT occupational grouping is of considerable importance for much of the labour market research undertaken by the Project. Analyses of occupational mobility, the linkages between occupational supply and educational attainment, etc., require that the IMPACT occupation groups are well defined in the terms of the level and type of skill. Because it was derived from the ABS occupational classification, which was not designed according to the principle of skill differentiation, the IMPACT grouping is unavoidably deficient in some areas in its delineation of different skills.<sup>1</sup> In addition, the reallocation of a few ABS occupation codes among the IMPACT minor occupation groups would improve the performance of the grouping in that respect.

Apart from these factors, the design of the IMPACT major occupation groups - the most commonly used level of the grouping - is such that, within one major group, Skilled White Collar, a significant degree of skill heterogeneity exists. For some analyses, it may be possible and beneficial to restructure the IMPACT major occupation groups (without causing any problems of discontinuities in existing data) by partitioning the Skilled White Collar group. This involves the formation of a major group for para-professional occupations and another for the administrative and managerial occupations within the framework of the existing IMPACT minor occupation groups.

1. It should be noted that the ABS, in conjunction with the Department of Employment and Youth Affairs, is currently developing a new Australian Standard Classification and Dictionary of Occupations (ASCO). Hopefully, the end product of that study will do much to overcome the many problems with the existing ABS occupational classification that face researchers studying the Australian labour market.

3. SKILL DIFFERENTIATION AND THE ABS OCCUPATION CODES

When the ABS occupation codes were regrouped to form the IMPACT major and minor occupation groups, the design of the ABS occupation codes was (and still is) a *fait accompli*. Thus although the objective of the regrouping exercise was to differentiate occupations on the basis of skill, to the extent that the ABS occupation codes are not homogeneous with respect to skill level, unavoidably the IMPACT occupation groups also exhibit internal heterogeneity of skill level. This section identifies some broad classes of ABS occupation codes that fall into this category. It would require a lengthy and detailed analysis of all the occupation descriptions covered by each of the 367 ABS occupation codes to identify precisely those codes which are significantly heterogeneous with respect to the level of skill. However, from a brief examination of the composition of the ABS occupation codes,<sup>1</sup> some general comments can be made and a number of glaring examples of (skill) heterogeneous codes can readily be found.

(i) The design of the ABS occupation codes in the blue collar area clearly differentiates skilled trade occupations from semi-skilled and unskilled occupations (production - process work) in only a limited number of cases.<sup>2</sup> This was made very apparent when the ABS was requested to undertake a survey to obtain information about apprentices and employees working as tradesmen for the (Williams) Committee of Inquiry into Education and Training.<sup>3</sup>

1. See ABS, Classification and Classified List of Occupations, June 1971, Commonwealth Government Printer, Canberra, 1971.
2. The ABS occupation groups (both at the major level and minor level) do not clearly differentiate amongst blue collar occupations on a skill basis to any extent. See Appendix 1.
3. See ABS, Apprentices and Employees Working as Tradesmen, September 1977 (Catalogue No. 6233.0).

This survey necessitated the fresh design of a "one-off" occupational classification to differentiate persons employed as tradesmen from other employees. The standard ABS occupational classification was deemed inadequate for the purpose of isolating skilled trade occupations.

As discussed in the previous section, the determination of the skill level of a particular occupation is made by reference to the nature (if any) of the available formal training. For assessing the skill level of blue collar occupations, the appropriate criterion, in general, is the existence of prescribed apprenticeship arrangements. An analysis of those ABS occupation codes covering blue collar occupation descriptions (of the standard ABS occupational classification), in conjunction with a listing of "proclaimed" apprenticeship trades,<sup>1</sup> does reveal a number of codes that are markedly heterogeneous with respect to skill level.

A striking example of such codes is the ABS code "724 Butchers and meat cutters." Although this code covers the occupation description "butcher" - a proclaimed apprenticeship trade - it also covers unskilled occupation descriptions (in terms of the low level of both formal and on-the-job training required) such as "abattoir worker," "rabbit skinner" and "slaughterhouse trolleyman." Table I lists some further examples of blue collar ABS occupation codes that are heterogeneous with respect to skill level. Each of these codes covers not only skilled (proclaimed apprenticeship) trades but also semi-skilled and unskilled occupations that involve production/process work. Table I also gives the corresponding IMPACT minor occupation group to which each of these codes has been allocated.

1. "Proclaimed apprenticeship trades" are those trades prescribed in State awards in N.S.W. and Western Australia, and in the case of the other four States they are those proclaimed by the Governor in Council. For a listing of these trades, see Department of Employment and Industrial Relations, Essential Features of Australian Apprenticeship Systems, AGPS, Canberra, 1977.

and one for minor groups 12 and 13, i.e., the administrative and managerial occupations.

The outcome of such a procedure would be to form a new IMPACT major occupation group (termed say, "Para-professionals") that would be reasonably homogeneous with respect to skill level.<sup>1</sup> In addition, it would isolate the problem occupations of employers, managers, etc., such that these occupations cannot "dilute", at the major group level, other skill differentiated minor groups. The two new major occupation groups so formed would be about equal in size and would still encompass more workers than many other IMPACT major groups - see Appendix 4.

If such a restructuring were contemplated for a particular labour market analysis, it might also be desirable at the same time to attempt to overcome some of the problems with the composition of the IMPACT minor group 4. Societal, that were discussed in Section 4. That is, the ABS occupation codes that were suspected of being misallocated (e.g., codes 085, 087) could be reallocated within the new major group for para-professionals (probably in the minor quasi-dump group 11. Creative).

1. The somewhat heterogeneous composition of the IMPACT minor groups 7. Technical Teachers, 8. Primary Teachers and 11. Creative might also cause some problems for particular analyses, irrespective of whether the suggested partition was performed.

Thus it is not surprising that the Skilled White Collar group is likewise heterogeneous.

The severity of this problem is increased however, because two of the other IMPACT minor groups in the Skilled White Collar group are composed of occupations that are essentially homogeneous with respect to the level of skill. Although these two minor groups 9. Para-medical and 10. Technicians cover a range of skill specialisations, they are of an equivalent skill level. Specifically, these minor groups cover those occupations that are variously described as "para-professional", "sub-professional" or "middle level". Entry to such occupations (by way of the education system) generally involves substantial periods of post-secondary training, but this training is less theoretically oriented than the formal training undertaken by their professional counterparts. The relationships between these para-professional occupations and particular types of formal education training are reasonably well defined.

However after aggregating these minor groups with the heterogeneous minor groups 12. Government and 13. Employers (along with the other minor groups 7. Technical Teachers, 8. Primary Teachers and 11. Creative) to form the IMPACT major group Skilled White Collar, this concept of an equivalent level of skill becomes lost. This obviously creates difficulties for those labour market analyses that use the IMPACT classification at the major group level and which require these groups to be differentiated on a skill basis (particularly education/labour supply analyses).

With hindsight, it would have been desirable to partition the major group Skilled White Collar into two groups - one for the minor groups numbered 7 to 11, i.e., basically the para-professional occupations,

Table 1 : SKILL HETEROGENEOUS ABS OCCUPATION CODES -  
BLUE COLLAR

ABS Occupation Code	Allocated to IMPACT Minor Group	Proportion of IMPACT Group (a)
602 Weavers, inc. loom tuners	25 Textile Trades	24%
603 Knitters & knitting machine setters, etc.	25 Textile Trades	19%
613 Upholsterers & related workers	32 Production & Process	3%
644 Machine tool setters & operators, etc.	18 Metal Trades	7%
655 Electroplaters, dip platers	18 Metal Trades	1%
669 Electrical & electronic workers, n.e.c.	27 Semi-skilled Metal & Electrical	2%
678 Woodworking machinists	21 Wood Trades	9%
688 Painters, n.e.c.	23 Painter	25%
693 Concrete & terrazzo workers	22 Brick Trades, etc.	14%
698 Building & construction workers, n.e.c.	28 Building	56%
721 Bakers, pastrycooks	24 Food Trades	21%
724 Butchers & meat cutters	24 Food Trades	51%

Notes: (a) "Proportion of IMPACT Group" is the ratio of total employed workers in each ABS code to total employed workers in the relevant IMPACT minor occupation group, as at the 1971 Census. The number of employed persons in each IMPACT occupation group is given in Appendix 4.

Source: 1971 Census of Population and Housing (unpublished data).

The problems that such skill heterogeneous codes cause, in the context of the design of the IMPACT minor occupation groups, are discussed in the next section.

(ii) The various codes pertaining to administrative and executive officials, employers, workers on own account, directors and managers (ABS codes 100-119) encompass a range of activities involving quite different skill levels. The rather unique problems these skill heterogeneous occupations cause for a skill based classification system are also considered in the following section.

(iii) There are several ABS occupation codes that are defined in terms of the ABS major or minor occupation groups of which they form a part. This design characteristic creates difficulties for the IMPACT occupational grouping since the ABS occupation groups are not homogeneous with respect to skill level. Hence individual ABS codes defined in terms of these groups tend to be similarly heterogeneous. Some examples of such codes, together with the IMPACT minor group to which they were allocated, are as follows:- ABS code "091 Other professional, technical and related workers, nec" to IMPACT minor group 4. Societal (5%),<sup>1</sup> "562 Other workers in transport and communication, nec" to 30. Drivers (2%), "669 Electrical and electronic workers, nec" to 27. Semi-skilled Metal and Electrical (2%) and "698 Building and construction workers, nec" to 28. Building (56%).

(iv) For the 1971 Census the ABS coded those persons describing themselves as engineers, architects, or surveyors, and most physical scientists strictly on the basis of the nature of (any) formal qualifications declared. Only persons who stated on the Census

1. The percentages in brackets are the proportions of total employed persons (as at the 1971 Census) in the relevant IMPACT minor occupation group accounted for by the ABS code in question.

It should be recalled that for their survey work, the ABS is unable to supply data which categorizes teachers according to their qualifications and the type of education system in which they work.<sup>1</sup> Thus when using ABS survey data, where all teachers are covered by the one occupation category, users may find it necessary to restructure the IMPACT occupational grouping. If the IMPACT grouping is being used at the minor group level, it may be necessary to amalgamate the appropriate IMPACT minor groups (for example see Appendix 5).

If the grouping is being used at the major group level, then one option available to the user is to form a new major occupation group for all teachers (i.e., effectively define IMPACT minor groups 5 to 8 to be a major group), thereby reducing the number of minor groups encompassed by the two existing IMPACT major groups Professional White Collar and Skilled White Collar. Alternatively, the user could allocate all teachers to just one of these two latter major groups. However, it should be noted that it may be possible for the user to disaggregate the ABS survey data for teachers on the basis of additional information (e.g., Census data), such that data corresponding to each of the IMPACT minor groups for teachers are estimated and no restructuring of the grouping is required.

(ii) The heterogeneous nature of the IMPACT minor groups

12. Government and 13. Employers causes a problem in the context of the IMPACT major groups. Both these minor groups form part of the major group Skilled White Collar and, as at the 1971 Census, they accounted for over half the number of persons employed in that major group (see Appendix 4).

1. See page 29 and also Appendix 5.



The modifications suggested in the previous section, regarding the reallocation of some of the ABS codes for teaching occupations amongst the four IMPACT minor groups for teachers would not affect this partition. In fact, by more tightly defining the two IMPACT minor groups 5. Tertiary Teachers and 6. Secondary Teachers in terms of skill level, these modifications strengthen the case for the nature of the partition adopted. It should be noted however, that the argument quoted above is probably unnecessarily restrictive, in that it is couched in terms of the holding of a degree as the criterion for the partition, whereas it would still be valid if presented in terms of the holding of any tertiary qualifications. That is, many professional occupations can be entered through formal education training via a diploma course as well as through a degree course.<sup>1</sup> The minor groups 7. Technical Teachers and 8. Primary Teachers should be allocated to the IMPACT major group Skilled White Collar rather than Professional White Collar because, although both groups cover teachers with a range of skills, overall neither group can be considered to involve a level of skill equivalent to that of other professional occupations. Technical college teachers represent a mixture of technical or trade qualified persons and tertiary qualified persons. The focus of most of their teaching is less theoretically oriented than that of secondary or tertiary education, as it is directed towards developing para-professional skills. Of all the teachers covered by minor group 8. Primary Teachers, only tertiary qualified primary teachers could possibly be considered to have a skill level comparable to other professional occupations.

1. Strictly, the argument quoted is not accurate if presented in terms of the holding of degrees only. The 1971 Census results showed that only 37% of all persons in the ABS codes for secondary school teachers held degrees (codes 053-055). Over 48% held diplomas or an equivalent qualification making a total of 85% with tertiary qualifications.

schedules that they held either bachelor degrees or higher degrees were allocated to the ABS occupation codes for professional engineers (codes 002-009), professional architects (001) and professional surveyors (010) within the ABS minor group "OA Architects, engineers and surveyors, professional". The identical restriction was applied to ABS codes 013-015 and 017 within the ABS minor group "OB Chemists, physicists, geologists and other physical scientists."<sup>1</sup> This coding procedure was adopted by the ABS as a means of conveniently handling the perceived type of problem that persons described themselves on Census forms as engineers whereas, in fact, they could be more accurately described as mechanics or locomotive drivers, etc.<sup>2</sup>

It is not exactly clear how the ABS coded those persons who described themselves as engineers, architects, surveyors or scientists but who held either no qualifications or only non-degree qualifications. The instructions for the Census coders stated that trainee engineers (in the labour force) and engineering assistants with partially completed degrees or diplomas were to be allocated to the engineering technician codes (codes 072-075, 077 and 078) in ABS minor group "OK Draftsmen and technicians, nec". Other persons describing themselves as engineers were to be

1. This coding procedure was identified by an analysis of (unpublished) 1971 Census tabulations which give the number of employed persons in each ABS occupation code cross-classified by qualifications held. The procedure is partially described (in so far as it pertains to engineers, architects and surveyors only, i.e., ABS codes 001-010), in ABS, Labour Statistics 1976 (Catalogue No. 6101.0), p.7. Note however that the original instructions for the 1971 Census coders did not restrict allocation to the professional engineering codes (002-009) only to those persons holding degrees. These instructions also permitted the allocation to these ABS codes of persons describing themselves as engineers who held technical college diplomas or who were members of an appropriate professional institute (see ABS, Index of Occupations, June 1971, Commonwealth Government Printer, Canberra 1971, p.15). It would appear that these instructions were subsequently revoked as the Census results show no persons in codes 002-009 as holding diplomas or any other qualification other than a degree.

2. See ABS, Labour Statistics 1976 (Catalogue No. 6101.0), p.7.

allocated to various codes within one of the metal and electrical minor groups of ABS major group '7/8 Tradesmen, Production - Process Workers and Labourers, nec' (e.g., ABS code '656 Engineers (so described), not professional, nec').<sup>1</sup> However in the ABS publication Labour Statistics 1976 (see footnote 1 on page 13) it is claimed that those persons describing themselves as engineers, architects or surveyors and who did not hold a degree, were classified to the ABS minor group 'OK Draftsmen and technicians, nec', i.e., codes 070-081. Given that this latter publication appears to give the correct version of the coding procedure actually adopted for such persons who held degrees (see footnote 1 on page 13), it seems likely that it is correct in this matter also. There is no description given in either of these two publications of how persons were coded who described themselves as physical scientists (of various types) but who lacked degree qualifications.<sup>2</sup>

The appropriateness of these occupation coding procedures is determined by the extent to which professional engineers, architects, surveyors and scientists (i.e. "professional" in a skill level sense) can be distinguished from those persons who incorrectly describe themselves in these terms, solely by reference to the holding of degrees. This restrictive procedure would obviously be satisfactory in the case of doctors where institutional barriers to entry to this occupation ensure that all persons practicing as doctors must have medical degrees. However for the

1. See ABS, Index of Occupations, June 1971, Commonwealth Government Printer, Canberra, 1971, p.13.
2. The index of occupation descriptions used by the 1971 Census coders allocated "chemists (so described), not professional" to the code "071 Physical science technicians" within the ABS minor group "OK Draftsmen and technicians, nec". However there were no general instructions given with regard to the coding procedure that was to be used for persons describing themselves as (type of) scientists. However on this evidence it seems likely that the equivalent coding procedure to that applied to engineers, architects and surveyors who did not hold a degree was also adopted in the case of physical scientists (i.e., as described in the ABS publication Labour Statistics 1976 - see above).

## 5. THE COMPOSITION OF THE IMPACT MAJOR OCCUPATION GROUPS

In the previous section, some of the IMPACT minor occupation groups were identified as being somewhat heterogeneous with respect to skill level. This was mostly a consequence of these groups being formed from likewise heterogeneous ABS occupation codes. Obviously this same problem of skill heterogeneity is transmitted into the corresponding IMPACT major occupation groups of which these minor groups form a part. Thus for example, the points made in Section 4 regarding the composition of those IMPACT minor groups concerned with skilled trade occupations apply also to the three encompassing major groups Skilled Blue Collar (Metal and Electrical), Skilled Blue Collar (Building) and Skilled Blue Collar (Other). Some other issues concerning the make-up of the IMPACT major occupation groups are discussed below.

(i) With regard to the allocation of the four IMPACT minor groups for teachers to the IMPACT major occupation groups, it was argued that the minor groups 5. Tertiary Teachers and 6. Secondary Teachers covered teachers that normally held degrees and hence should be part of the major group Professional White Collar. Conversely, it was argued, that since technical teachers and primary teachers did not require a degree but only a teaching diploma and hence could not move into other professional occupations, the IMPACT minor groups 7. Technical Teachers and 8. Primary Teachers should be part of the IMPACT major group Skilled White Collar.<sup>1</sup>

1. See M.K. McIntosh, op.cit., p.58.

Both these points obviously impinge on the use of the IMPACT occupational grouping for certain analyses where the available data dictate that the IMPACT minor groups for teachers cannot be defined as required. This has important implications for the composition of the IMPACT major occupation groups. This matter is taken up in the next section.

occupations in question here, this coding procedure seems overly restrictive. For example, persons admitted to the various professional engineering institutes are not required to hold degrees. Many have completed diplomas at Colleges of Advanced Education or technical colleges or have acquired their skill through on-the-job training and then subsequently passed examinations held by the professional institute concerned. There seems little evidence to support the proposition that substantive differences exist between the skill level of engineers holding degrees and those holding diplomas or qualifications awarded by a professional institute - all should be regarded as professional engineers.<sup>1</sup>

Thus the procedure of allocating those persons describing themselves as engineers, but not holding degrees, to the various ABS codes for engineering technicians has the consequence of making such codes heterogeneous with respect to the level of skill, since technicians have a lower level of skill than professional occupations. (In addition, included amongst this allocation would be those persons inaccurately describing themselves as engineers and who in reality work in various occupations with lower skill levels than technicians - see above). The ABS occupation codes for technicians are all allocated to the IMPACT minor occupation group 10. Technicians (and at the 1971 Census they accounted for 53% of the employed persons in this group). Given, however, that inaccurate descriptions are provided on Census schedules then some skill heterogeneous codes will inevitably result from whatever (essentially arbitrary) method is chosen for coding such persons, unless more information about the nature of the work performed is obtained.

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1. The original instructions for the 1971 Census coders pertaining to engineers acknowledged this point (see footnote 1 on page 13).

In contrast, for their survey work (e.g., Labour Force Surveys) the ABS is unable to code engineers according to their qualifications, as is done for the Censuses, since no question on qualifications is asked routinely in the surveys.<sup>1</sup> Thus all persons describing themselves as engineers are allocated to the appropriate code in the ABS minor group "OA Architects, engineers and surveyors, professional" (ABS codes 002-005 and 007-009). Hence, in ABS survey data, it is these professional engineering codes that can be expected to be skill heterogeneous. These codes are all allocated to IMPACT minor group 2. Engineers in the IMPACT occupational grouping. It may be thought, that the problem of inaccurate description of engineers is lessened somewhat in the case of ABS surveys, since they are conducted on a personal interview basis. Interviews by trained survey personnel (as opposed to the Census which is self-enumerated) should increase the accuracy of response.<sup>2</sup>

1. See ABS, Labour Force Survey, May 1978 (Catalogue No. 6203.0), footnote (b) on page 14.

2. It should be noted that for the 1976 Census whilst the instructions for the coding of engineers were unchanged from those of the 1971 Census (i.e., only degree, diploma and professional institute qualification holders to be allocated to the ABS codes for professional engineers) the (unpublished) Census results suggest that persons have been allocated to these codes irrespective of qualifications held (e.g., of the persons employed in ABS minor group "OA Architects, engineers and surveyors, professional", 13% had technician qualifications, 2% had trade qualifications and 3% had no post-secondary qualifications).

However in this light, it would have been more appropriate to allocate the two ABS codes for "miscellaneous" teachers, i.e., codes 058 and 059, to the IMPACT minor group 8. Primary Teachers rather than 6. Secondary Teachers. In addition, the ABS codes for teachers without qualifications at tertiary institutions (codes 043, 046 and 049) should also have been allocated to 8. Primary Teachers along with code 055. Such procedures would effectively consign to the one minor group most of the intractable problems associated with classifying such a skill heterogeneous category of occupations as teachers.

Two important points should be noted concerning the viability of using the IMPACT minor groups for teachers, given the available data. The first point concerns some apparent peculiarities in the 1971 Census data. For example, these data revealed that of the total number of employed persons in the ABS codes for teachers at universities (codes 043-046), 24% were in the code for university teachers without tertiary qualifications (046). Intuitively, this seems unrealistically high. Further analysis revealed that of the employed persons in code 046, about 80% of such persons did hold tertiary qualifications. Thus, assuming no errors in the compilation of the data, it would appear that the final Census coding of persons to the teaching codes may not have been performed as initially described in the instructions to the coders. The second point is that for their survey work, the ABS does not distinguish between teachers on the basis of qualification, due to a lack of the necessary information. This factor, combined with the confidentiality problems caused by the small sample sizes, means that no disaggregation of teachers is possible for the ABS survey data, i.e., all teachers are classified to the one occupational category.

technical teachers on the basis of tertiary qualifications alone would not form two skill homogeneous categories. There may still be a case though, for considering that tertiary qualified technical teachers are potentially more 'upwardly' mobile than those without tertiary qualifications, irrespective of whether or not persons in this latter category hold technical or trade qualifications.<sup>1</sup>

The IMPACT grouping differentiated between the skills of secondary teachers with tertiary qualifications and secondary teachers without tertiary qualifications, by allocating these latter teachers (code 055) to the IMPACT minor group 8. Primary Teachers. Given that there is some constraint on the number of occupation groups created for teachers, and also some minimum size for a group, this allocation can be rationalised in terms of being the only apparent option available. It has already been noted that the grouping together of the two ABS codes for primary teachers and pre-school teachers makes the minor group 8. Primary Teachers somewhat skill heterogeneous. It should also be noted that there is some degree of skill heterogeneity within the ABS code for primary teachers (code 056). For example, this code encompasses both tertiary qualified primary teachers (who have completed a three or four year diploma course) and unqualified teaching aides. Thus the allocation of code 055 to this minor group, whilst adding to the degree of skill heterogeneity within that group, does not create any new problems. That is, this minor group can, in a sense, be regarded as a quasi-dump group for those ABS teacher codes that do not fit cleanly into the other three IMPACT minor groups for teachers.

1. Primary school and pre-school teachers were not differentiated on the basis of qualification by the ABS codes. See footnote 1 on page 24.

#### 4. THE CONSTRUCTION OF THE IMPACT MINOR OCCUPATION GROUPS

In addition to the intractable problem of constructing a skill based occupational grouping from a given set of occupation codes where some of those codes are heterogeneous in terms of skill level, some further matters arise from the manner in which the ABS codes were combined to form the IMPACT minor occupation groups. These problems and other issues concerning the IMPACT minor occupation groups are considered below.

(i) The exact criteria by which the ABS occupation codes in the blue collar area were allocated to the IMPACT minor groups for skilled trade occupations (minor groups 18 to 26) and to those for semi-skilled and unskilled blue collar occupations (minor groups 27 to 34) are not at all clear. In the relevant IMPACT documentation the allocation method was described in the following terms.

"In the Skilled Blue Collar areas, occupations have been included only where they require an apprenticeship in most States of Australia, or at least in the most populous States. Occupations with mixtures of skilled and unskilled persons have been grouped according to their majority."<sup>1</sup>

The first part of this explanation seems to suggest that, for those ABS occupation codes in the blue collar area, an analysis of the occupation descriptions covered by each of these codes was undertaken, to determine whether or not the occupations involved were apprenticeable trades. Using the existence of apprenticeship arrangements as the basis for assessing the skill level of blue collar occupations is, in itself, a

1. See M.K. McIntosh, op. cit., p. 58.

satisfactory practice - see page 10. Consequently, the allocation of those ABS occupation codes that are composed entirely of occupation descriptions which correspond to apprenticeship trades<sup>1</sup> was straight-forward. Such codes were allocated to the IMPACT occupation groups for skilled trades (e.g., ABS code "642 Fitters, etc." to IMPACT minor group 18. Metal Trades, "679 Patternmakers" to 21. Wood Trades, etc.).

However in the case of an ABS occupation code that is only partly composed of apprenticeable trades (e.g., those heterogeneous codes listed in Table 1), the allocation criterion that was used cannot be deduced from either the explanation above or from an analysis of the final allocation of such codes. There are no data collected on the numbers of workers covered by each individual occupation description within a particular ABS code - the most disaggregated data available pertain to the entire ABS occupation code itself. Thus allocation "according to their majority" (see above), cannot mean a "majority" in terms of numbers of workers in apprenticeable/non-apprenticeable blue collar occupations.

Furthermore it does not appear to mean that, if within a particular ABS code there is a majority of occupation descriptions pertaining to apprenticeable trades, then such a code was allocated to an IMPACT skilled trades group. There are several codes within which non-apprenticeable occupation descriptions clearly outnumber apprenticeable occupation descriptions but which were allocated to IMPACT minor occupation groups for skilled trades (e.g., ABS codes "724 Butchers and meat cutters" to IMPACT minor group 24. Food Trades, "602 Weavers including loom tuners" to 25. Textile Trades, "693 Concrete and terrazzo workers" to 22. Brick, etc., Trades).

1. This can be ascertained by the procedure (described on page 10) of checking the composition of these ABS occupation codes against a list of proclaimed apprenticeable trades.

length of formal training necessary to enter each of these occupations. However, as the total number of pre-school teachers is only about 5% of the total number of primary teachers, it would not be appropriate to form an additional occupation group for pre-school teachers - hence such teachers were allocated to the IMPACT minor group 8. Primary Teachers.

In terms of skill differentiation, the procedure adopted by the IMPACT occupational grouping in distinguishing between secondary teachers on the basis of the holding of tertiary qualifications seems valid. In most schools in the secondary system, teachers without tertiary qualifications are prohibited by administrative barriers from performing certain functions. In addition, the potential "upward" job mobility of secondary teachers with tertiary qualifications is greater than that of secondary teachers who lack tertiary qualifications. However, intuitively, the same arguments also apply to teachers employed at tertiary institutions (e.g., in most cases lecturers and tutors are required to hold tertiary qualifications). Thus it does appear that the IMPACT grouping may be somewhat inconsistent on this matter (from a skill viewpoint) in confining the distinction between qualified and unqualified teachers to the secondary schools alone and not extending it to the tertiary institutions as well. (The corresponding suggested modification to the composition of the IMPACT minor groups is outlined on page 29). The appropriateness of such a partitioning for technical teachers is not clear. Unlike the secondary and tertiary education systems, any qualifications barrier to entry into technical college teaching is in terms of the holding of a teaching qualification (i.e., tertiary qualifications) or a trade or technician qualification (i.e., non-tertiary qualifications).<sup>1</sup> Thus partitioning

1. According to the 1971 Census results, over 40% of employed persons in the ABS codes for technical college teachers (codes 050-052) held trade or technician qualifications.

There is no explanation for this allocation procedure in the relevant documentation.<sup>1</sup> Clearly, when constructing occupation categories delineated on the basis of skill, it would be inappropriate to create only one category for all teachers, given the wide range of skills involved. At the same time, there are obvious limits to the number of categories that should be created for teaching occupations, in order to keep the overall classification to a manageable size. Thus, working within the constraint of having to form skill differentiated occupation groups by aggregating the ABS codes, the options with respect to the ABS teaching codes are to distinguish between teachers on the basis of the type of teaching institution or the holding of tertiary qualifications or some combination of both.

The IMPACT occupational grouping delineates its minor occupation groups for teachers essentially on the basis of type of teaching institution. From the viewpoint of designing skill differentiated occupation groups, this is an obvious starting point. There are significant differences between the skills of university lecturers and pre-school teachers, for example. Likewise, the skills and functions of technical teachers tend, in general, to be different to those of their tertiary or secondary system counterparts, being associated with less theoretically oriented training (although there is some overlap in the area of general teaching, e.g., mathematics, English, etc.). Within the tertiary education system, university teachers and CAE teachers are reasonably comparable, both in terms of their level of skill and teaching functions, and hence are grouped together. On the other hand, it is not clear that the skills of pre-school teachers are strictly comparable with those of primary school teachers, given the differences that exist in the

1. See M.K. McIntosh, op.cit., p.58.

In summary, the exact allocation procedure adopted remains unclear.<sup>1</sup> What is clear is that most of the ABS occupation codes in the blue collar area that are obviously skill heterogeneous have been allocated to the IMPACT occupation groups for skilled trades (see Table 1). This procedure obviously results in the IMPACT skilled trade groups being more heterogeneous in terms of skill level than otherwise would be the case.

It is not possible to ascertain exactly the magnitude of this problem since there is no other skill based occupational classification system in use with which the IMPACT occupational grouping can be directly compared. A rather dubious comparison can be made with the "one-off" occupational classification used for the 1977 ABS survey of apprentices and employees working as tradesmen (see page 10). This survey showed that 30% of workers employed in skilled trades - - as defined by this 'one-off' classification - - were unqualified (including apprentices). In contrast 1971 Census data - - recompiled according to the IMPACT occupation grouping - - showed that 45% of workers employed in the IMPACT skilled trades groups had no qualification.

Now despite the limitations of this comparison, due to differences in coverage and the method of enumeration, this significant difference cannot be explained entirely as being merely the increase in the educational attainment of workers in skilled trades occupations over the period 1971 to 1976 (given the relevant apprenticeship statistics).

Obviously a more satisfactory comparison will be possible when the 1976 census results become available. However, *prima facie*, there appears to be

1. Nor was the allocation procedure based on determining whether or not a majority of workers in these heterogeneous codes hold formal trade qualifications - such data are available from the 1971 Population Census (unpublished). (Note that, as discussed previously, the adoption of this criterion would not have been appropriate in any case, since there is not a very close relationship between skilled tradesmen and the holding of formal trade qualifications - see page 7).

a difference between the IMPACT occupational grouping and this "one-off" classification in the definition of skilled trade. Specifically, this difference is most likely explained by the higher degree of internal heterogeneity existing in the IMPACT skilled trades groups, i.e., the misallocation of unskilled workers to these groups who possess no formal qualifications.

(ii) The IMPACT minor occupation group 4. Societal is not as homogeneous with respect to skill level as the other minor groups in the IMPACT major occupation group Professional White Collar. This is partly a result of two skill heterogeneous ABS occupation codes being allocated to this minor group, but it is also a consequence of an apparent misallocation of two other ABS codes.

Both the ABS codes "083 Social workers" and "091 Other professional, technical and related workers, nec" are heterogeneous in terms of their skill composition. The former code includes occupations encompassing a wide range of formal and informal training requirements, e.g., girl guide trainers and tertiary trained social welfare workers. In fact for the 1976 Census, the ABS split this code into two separate codes - one for "professional" social workers and one for "non-professional" social workers. The ABS code "091 Other professional, etc." is skill heterogeneous because it is defined in terms of the ABS major group "Professional, technical and related workers", which is itself heterogeneous.

In addition, there are two ABS codes that were allocated to the Societal group which encompass occupations that involve a significantly lower level of formal training compared to the other occupations in this IMPACT minor group, and compared to that for professional occupations in general. The first of these codes is "085 Librarians and

The IMPACT occupational grouping allocates the nineteen codes for teachers (041-059) among four minor occupation groups, each of which corresponds to a type (or several types) of teaching institution. These four IMPACT minor groups are 5. Tertiary Teachers (which covers teachers at universities, colleges of advanced education, teachers colleges and other tertiary institutions without CAE status), 6. Secondary Teachers (which covers teachers at secondary schools), 7. Technical Teachers (which covers teachers at technical colleges/schools) and 8. Primary Teachers (which covers teachers at both primary schools and pre-schools). In general, all three codes pertaining to a particular type of institution (i.e., the three codes for executive teachers, teachers with tertiary qualifications and teachers without tertiary qualifications) are allocated to the same IMPACT minor group. However, the ABS code for teachers at secondary schools with no tertiary qualifications (code 055) has not been allocated to the IMPACT minor group 6. Secondary Teachers, which contains the other two codes pertaining to secondary schools (for executive teachers and teachers with tertiary qualifications - codes 053 and 054). Instead, code 055 has been allocated to the IMPACT minor group 8. Primary Teachers. The two ABS codes for teachers at primary schools (056) and pre-schools (057) were also allocated to this IMPACT minor group. The two remaining ABS codes for teachers at other education institutions (058) and teachers not elsewhere classified (059) were allocated to the IMPACT minor group 6. Secondary Teachers.



to the nature of their work, thus enabling them to be allocated to the other skill differentiated groups. For example, those occupation codes relating to government inspectors probably include occupations that are similar in skill level and work content to many clerical occupations.

(It should be noted that under the ABS classification, if a person states his occupation as a profession or trade, then even though he exercises managerial or administrative functions, he is coded to that profession or trade, e.g., pharmaceutical chemist.)

The problem still remains of how to treat these unavoidably "difficult" minor occupation groups 12. Government and 13. Employers when designing ten or so major occupation groups. This question is taken up further in the next section.

(iv) The general occupation description "teacher" poses problems, similar to those connected with the occupation descriptions "employer", "manager", etc., to the extent that it is a response given by people in jobs that involve a disparate range of skills. It covers such (skill) diverse occupations as university lecturers and play centre teachers. For the 1971 Census, the ABS coded teachers according to the categories "executive teachers", teachers "with tertiary qualifications" (i.e., a diploma or degree) and teachers with "no tertiary qualifications", cross-classified by the type of teaching institution by which they were employed (e.g., ABS codes "050 Executive teachers, technical colleges", "043 Other teachers, no tertiary qualifications, universities", etc.).<sup>1</sup>

1. The exceptions to this coding procedure were that all teachers at primary schools were allocated to the one ABS code (056) and all teachers at pre-schools were allocated to code 057. See ABS, Index of Occupations, June 1971, Commonwealth Government Printer, Canberra, 1971, p.8 and ABS, Classification and Classified List of Occupations, June 1971, Commonwealth Government Printer, Canberra, 1971, p.35-41.

archivists, other" which is restricted to "non-professional" librarians, i.e., those persons describing themselves as librarians who do not hold a degree or registration certificate.<sup>1</sup> This code includes such occupations as music record librarians and film librarians.<sup>2</sup> The other code is "087 Personnel specialists" which, although it covers occupations with a diverse range of skill levels, overall cannot be considered to be comparable with other professional occupation codes in terms of the extent of formal or informal training required.

It has been stated throughout this paper that the extent to which workers in an occupation hold formal qualifications is not necessarily an accurate indicator of the skill level of that occupation, since informal on-the-job training may be a common means of entry into that occupation. However in the case of professional occupations there is a heavy emphasis on entry through formal educational training and more importantly in most cases this has existed for the greater part of a working lifetime. Thus for professional occupations in general, it is reasonable to expect a significant proportion of workers to hold formal qualifications.

In this context, the following table, while not providing conclusive evidence, certainly lends support to the arguments outlined above. The table shows the ABS occupation codes that make up the IMPACT minor group 4. Societal and gives the proportion of people employed in each ABS occupation code who possessed some form of tertiary qualification (i.e., a degree or diploma) as at the 1971 Census.

1. Those librarians with degrees or registration certificates were allocated to code "084 Librarians and archivists, professional" for the 1971 Census.

2. The points made in the previous section, with regard to the validity of defining professional engineers solely on the basis of formal qualifications, are of some relevance here. However, in the case of librarians more appropriate formal qualifications do appear to have been chosen as the criterion.

Table 2 : EXTENT OF TERTIARY QUALIFICATIONS  
IN IMPACT MINOR GROUP 4. SOCIETAL

ABS Occupation Codes in Societal Group	Proportion of Occupation Code with Tertiary Qualifications
082 Accountants, auditors	(.42) .78
083 Social workers	(.08) .42
084 Librarians and archivists, professional	(.05) .92
085 Librarians and archivists, other	(.05) .17
086 Economists, economic consultants, actuaries and statisticians	(.06) .67
087 Personnel specialists	(.10) .28
064 Judges, magistrates, barristers, solicitors and legal officers	(.19) .91
091 Other professional, technical and related workers, n.e.c.	(.05) .69
Total Group	(1.00) .69

Note: Figures in brackets give the proportion of employed workers in the Societal group accounted for by each occupation code as at the 1971 Census. The Societal group itself accounted for 28% of the major group Professional White Collar in 1971 (see Appendix 4).  
Source: 1971 Census of Population and Housing (unpublished data).

The Societal group was designed to serve partly as a dump group for professionals.<sup>1</sup> It would appear, however, that two dump groups may be necessary for white collar occupations - one for professionals and one for skilled white collar or para-professional occupations. In fact the IMPACT minor occupation group 11. Creative serves as a quasi dump group within the IMPACT major group Skilled White Collar. At least some of the ABS occupation codes discussed above would appear to be better suited in a dump group for para-professionals.

1. See M.K. McIntosh, *op.cit.*, p.58.

(iii) The individual ABS occupation codes relating to government administrators, executive officials and inspectors (codes 100-106) were grouped into the IMPACT minor group 12. Government, and those codes relating to employers, managers, directors and workers on own account (excluding proprietors and shopkeepers in retail and wholesale trade not employing others (codes 100-119)) were grouped into the IMPACT minor group 13. Employers. These two IMPACT minor groups are identical to the two ABS minor groups "IA Administrative and executive officials, government, n.e.c." and "IB Employers, workers on own account, status 0, directors, managers, n.e.c.". That is, both the ABS and IMPACT classifications form identical minor occupation groups from the above codes.

The various ABS codes pertaining to employers, workers on own account, etc., are delineated solely according to the industry in which such persons are working,<sup>1</sup> and not by the nature of their work, level in a hierarchy, qualifications, etc.. Similarly the codes pertaining to administrative and executive officials and inspectors are delineated solely on the basis of the respective level of government (i.e., Commonwealth, State or Local). Not surprisingly, the two IMPACT minor groups 12. Government and 13. Employers are highly heterogeneous with respect to skill level.

However it is difficult to conceive of any classification based on skill level that could avoid this problem completely, given that occupation descriptions such as "employers", "manager", etc., are unlikely to disappear. Probably the most that can be done is to limit the size of these groups as much as possible, by obtaining more information from such people in regard

1. Each ABS code in the ABS minor group "IB Employers, etc." corresponds to a broad group of industries (e.g., all such persons in building and construction industries are allocated to the one code).