
Defining The Target Domain: What Language Skills Are Required Of Engineers And Nurses?¹

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Introduction

The past 15 years have coincided with unprecedented levels of skilled immigration to Australia from non-English speaking background (NESB) source countries - a trend exemplified within the engineering and health professions.

Between 1966 and 1986 an average of 817 engineers per year migrated to Australia (Rice 1992). These engineers were predominantly British or European in origin, and fairly quickly absorbed by labour market demand. In the late 1980s, as Australia's skilled migration program expanded, there was a major and unheralded departure from this pattern. The arrival of immigrant engineers surged, with 18,581 entering Australia between 1986-87 and 1992-93 (Hawthorne 1994a), and the peak year of 1990-91 seeing an increase of more than 500 per cent on pre-1986 annual figures. A markedly higher proportion of these engineers than previously were NESB, and of racially and culturally diverse origins. In 1982-83, 38 per cent of immigrant engineers had derived from British source countries, compared with 32 per cent Asian and 5 per cent East European in origin. By 1991-92 the proportion of British-descent engineers had reduced to 12 per cent of the yearly total, in favour of substantial growth in Asian and East European engineers (respectively 58 per cent and 18 per cent). In 1990-91, the year 4258 engineers migrated, 1118 engineers were accepted from Hong Kong alone, 640 from India and 377 from Malaysia (Hawthorne 1994a).

¹ Sections of this paper previously appeared in 'The Question of Discrimination: Skilled Migrants' Access to Australian Employment' (L. Hawthorne, *International Migration Quarterly Review*, Vol 35, No 3 1997, Geneva) and *Labour Market Barriers for Immigrant Engineers in Australia* (L. Hawthorne, AGPS, Canberra, 1994).

Engineering migration had thus become a largely Asian phenomenon.

This pattern of increasing ethnic diversity was simultaneously occurring in the health professions - including the 17,603 nurses, 3,567 doctors and 804 dentists approved to migrate to Australia between 1982-83 and 1992-93 (Hawthorne 1994b). By 1991 the state of Victoria was registering overseas qualified nurses from 48 countries of origin in a single year - discounting the many applicants who were not immediately judged as eligible (VNC 1991). The training, cultural background and linguistic capacity of an increasing proportion of these professionals would be unfamiliar to either Australian registration bodies or employers - a factor with clear ramifications for qualifications recognition and employment potential (Iredale 1987).

Though the majority of recent skilled migrants have been categorised by Australia as 'NESB', it is important to note at the outset that this term in fact masks highly differential levels of English. Substantial numbers of professionals reaching Australia from former Commonwealth countries, or the Middle East, have in reality been virtual native speakers of English - using variants primarily differentiated from Australian norms by accent and intonation. Frequently such professionals have been wholly or partially educated in English, either within their country of origin or through completion of tertiary degrees in countries such as the UK or Australia (Shu & Hawthorne 1996; Williams 1989). In addition, many European professionals - west Europeans in particular - reach Australia with a sophisticated level of English due to repeated telecommunications exposure, travel and school education. In a world increasingly characterised by the mobility of skilled labour (Inglis & Stahl 1993), still other NESB professionals have employed English as a lingua franca in multinational contexts, eg on contract employment within the Gulf States (Hawthorne 1994a). For all these reasons, the term 'NESB' may signify *cultural* and *racial* differences in migrant professionals, rather than any substantial deficits in English. This point has been insufficiently stressed in the Australian literature to date. It is essential to bear it in mind, however, when examining linguistic barriers.

Within a transitional period such as our own, a critical issue for many skilled migrants may be the gulf in Australia between

immigration policy and employer preference. Though employment patterns converge towards the Australian norm over time, in the first five years post-arrival many skilled NESB migrants experience markedly inferior employment outcomes (Birrell & Hawthorne 1997). Immigration policy has typically advanced ahead of public opinion in Australia. Employers can pick and choose among applicants - particularly at times of weak labour market demand. Whatever the Australian government's assumptions, 'employers may not view the skills that migrants have acquired overseas in the same light as similar skills acquired in Australia' (BLMR 1986: 6). Despite the evolution of anti-discrimination and equal opportunity legislation in Australia through the 1970s and 1980s (Niland & Champion 1990), the onus for change and adaptation to date has rested primarily with immigrant job seekers (Wooden 1994; Brooks & Williams 1995). Incoming migrants are expected to strive for success by making 'an active attempt to adapt their existing skills, acquire new skills, seek out job opportunities, and generally improve their knowledge of the Australian labour market' (BLMR 1986: 6-7). Chief among the adaptations expected is development of an 'appropriate' level of competence in English.

The target domain analysis provided below draws on data from two recent major studies concerning engineers (Hawthorne 1994a) and nurses (Hawthorne & Toth 1996) - the dominant professional groups of skilled migrants. Both studies were funded by Australia's Bureau of Immigration, Multicultural and Population Research.

Migrant engineers: the language required for accessing employment

According to a wide range of informants, Australian employers' English language requirements have come as a rude shock to NESB engineers reaching Australia over the past decade. Prior to immigration, many do not view their lack of English as a barrier to employment - confident that engineering is technical work, for which ESL is not particularly important. According to one Polish engineer (still unemployed three years after arrival) "In structural engineering it's not a very big problem because there is not a lot of contact with people". A Romanian engineer with no ESL whatever on arrival said she had never considered language problems in relation to work. "When we show what we can do, maybe there will be a chance for us."

In marked contrast to views such as these, Australian agents and employers view high level ESL as 'absolutely mandatory' to Australian employment, to the degree that "You do not get your foot in the door if you do not clearly speak English!". Some Australian employers are reported as "once bitten twice shy" in relation to NESB employees, having hired people in the past whose language limitations have proven a liability. Given this concern, a range of strategies are adopted by employment agents to test ESL levels, since recruiters are aware that strong written applications may be ghosted. One agent times interviews, as indicative of the speed and efficiency with which NESB engineers can give information. Several request written questionnaires to be filled in on site, with 'free-fields' deliberately placed to test written communication. A third technique to screen out the worst communicators is the placing of unexpected phone calls - described as "a quick and effective edit", "a real acid test", that can sabotage migrant engineers' dependence on pre-prepared scripts. At interview an NESB engineer might be asked to explain 10 diagrams, a strategy which linguistically causes "50 per cent of them to die a million deaths". The result may be devastating:

"They're struggling over English and having to sort of pluck the rights words from the air, and they stumble and it takes them longer to say what they want".

These techniques are not seen as unfairly discriminatory. In contrast to the views of NESB engineers, employers regard advanced ESL as vital to competent engineering performance, because:

"When you design something, you've got to understand what's wanted. When you've designed it, you've got to present it. When you're selling something, you've got to get the idea across. Also when you're employed by someone, you've got to fit in as part of a team. So communication skills at all levels - verbal, non-verbal, written, spoken - are *critical!*"

It is acknowledged by Australian agents that the level of ESL ability required depends to a degree on the type of work and the size of employer. Migrant engineers with less ESL ability may be lucky and secure a purely technical 'backroom' job, although in recent years these are generally vanishing; large organisations may offer greater 'cushioning' of language deficits. In smaller companies, in sharp contrast, oral communication is typically high speed, idiomatic, and based on comprehension of every nuance of meaning.

In the light of the range of their perceived deficits, it can be enormously difficult for NESB engineers to write job applications that will secure interviews. Sometimes the decisive factor may be something as seemingly slight as an alien name - with employers unwilling to interview 'Mr Unpronounceable'. More frequently, applications are marred by poor presentation, including grammar and spelling that are described as "appalling". Beyond these barriers there is the issue of content. Newly arrived NESB engineers typically have immense difficulty representing past experience in a format comprehensible to Australian employers (Hawthorne 1992). Though trained in general English, they may have minimal knowledge of the field-specific vocabulary required to do justice to the positions they have held, or appropriate ways of presenting descriptions of process, the level of technology used, employment context, and personal achievements. According to one agent,

"It's not good enough (if) they say they worked on the development of a system. What did you do on it? Did you work as part of a team? Did you program it? Did you do analysis and design - they don't tell you, and they don't know *how* to tell you!"

The communication task itself may be exceptionally demanding. Lacking local referees, known employers and Australian experience, NESB engineers have to convince employers verbally of the validity of their skills, and their capacity to adapt these swiftly in Australia. Inadequate levels of ESL and lack of precise engineering terminology may greatly impede this process. One employer said in frustration of the interview process, NESB engineers need to be able to "Give some indication that a logical approach is within their grasp!". In doing so they must also demonstrate knowledge of local standards and current issues such as industrial restructuring - all the while finely judging the stylistic and informational balance required. Some try too hard, giving so much detail it is "overwhelming". Others appear "evasive" - perhaps when they haven't understood the real intent of a question. Though a number clearly don't understand questions, they may plough on regardless with answers. All such problems can "ring alarm bells" in relation to English language competence. According to one agent:

"(D)esigning something and working on it is not a case of giving a once-off bundle of information... It has to involve constant feedback, and quite often it's easy to see in an

interview that (the migrant) is only getting a very small percentage of the conversation. And once an employer perceives that, they become very very frightened.... If the employer can't be sure that person understands what's happening round them, then they are going to have great difficulty getting a job even as a draughtsman."

Migrant engineers: linguistic adjustment within employment

Even NESB engineers well-trained in job-seeking skills may find themselves minimally prepared to deal with the linguistic challenges embedded within Australian employment. For many the major problems will be oral and aural communication - typically far more significant than deficits related to reading or writing. Engineers expressing concern may be those with comparatively high standards of English - advanced enough, perhaps, to see the competencies they lack and to discern the limitations this imposes on them. According to a range of NESB engineers and Australian employers surveyed, essential skills include:

- An intimate knowledge of contemporary industrial issues (related to industry restructuring, industrial relations, engineering standards, computer programming etc), supported by a capacity to express this knowledge in English;
- Sophisticated communicative competence within a wide range of practical situations, including the ability to 'do business' in person and over the phone (describe engineering processes, hypothesise, problem-solve, negotiate, order, and justify decisions);
- In terms of such functions, the ability to start, finish and make appropriate transitions within conversation;
- In relation to writing, competent use of faxes as the main mode of business - embracing use of abbreviation, an appropriately epigrammatic style, and the 'right' degree of formality;
- When writing reports, the ability to adapt to in-house style, as well as use of pre-prepared templates;
- In terms of all the above, an ability to accurately use field-specific terminology, including in-house jargon.

Commercial English for Specific Purposes texts such as Cassell's 'General Engineering' (Johnson & Johnson 1988) simply do not

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prepare migrant engineers for contemporary engineering employment - being British rather than Australian in origin, generalist rather than field-specific, non-communicative in style, and methodologically dated. Nor is such preparation readily found in Australian English for Engineers courses, which place their prime focus on job-seeking skills, and are rarely field-specific. For the majority of NESB engineers linguistic adaptation is therefore a personal process, which takes place over time and on the job. Accents are frequently reported to be a significant problem - as in the case of an Indian engineer who described spending a year modifying his intonation pattern. Those with less developed ESL skills describe frustration with their limitations - recognising a lack of versatility and breadth in vocabulary and style, particularly in spontaneous interpersonal situations (eg facing hostility, having to persuade). A Polish electronics engineer, despite gaining substantial promotion, stated "To be true I don't know if I should be a project leader, because of English.... Simply, I have no fluency in spoken English - that's the main problem". A Brazilian telecommunications engineer with excellent all-round skills described his first employed months as "a disaster" in terms of language - involving a combination of Australian idiom and professional jargon which effectively blocked him out:

"What happened is that they've got their codes of communication here. And when they mention a circuit, for instance, they would call CUD 1001! Very quickly! They didn't call the equipment by name - they had again a code. And when they had a client, they call by initials."

The challenge such adjustment poses may be critical for engineers employed in positions which make intense and immediate demands on communicative ability. A Hungarian mechanical engineer, securing computer-based work, found himself obliged to troubleshoot user problems over the phone, when he couldn't even see the computer malfunction he was meant to be solving. Those first months were professionally hazardous, given his total ignorance of terms like 'scroll' and 'debug'. Many NESB engineers identify telephone communication as presenting their worst transitional challenge, though most develop clarification and listening strategies that ease the problem with exposure and time. Once terminology has been mastered, a further barrier relates to cross-cultural style. A Russian engineer found he had to substantially modify his response to stress in employment situations:

"Number one - no direct contradictions, no direct struggle. Just without stress, without any angry voice... Just very quiet, very relaxed conversation about this topic."

Despite being listed in the World Who's Who of Engineering, this engineer has already been retrenched twice. In at least one case this appears to have been due to cross-cultural breakdown.

The target domain for migrant nurses

Until mid-1992 it was rare for NESB engineers to have their language skills tested pre-migration (Hawthorne 1994b, 1995). Substantial numbers in consequence attempted to secure Australian employment with inadequate linguistic preparation. The situation is radically different for NESB nurses - the second largest skilled migrant group in Australia, and one obliged since the late 1980s to pass an occupation-specific language test as a pre-condition of professional registration.

Devised by Tim McNamara of the University of Melbourne (McNamara 1990, 1996), this test acts as a powerful gatekeeper to the nursing profession - with 57 per cent of nurse candidates failing over the past 5 years, compared to just 22 per cent of doctors (Hawthorne & Toth 1996). In theory, those passing all four modules of the Occupational English Test (speaking, listening, reading and writing) should be well-placed to deal with the linguistic demands of their profession - particularly given many will have completed two to five General English and English for Health Professionals courses prior to securing preliminary employment. Analysis of 229 OET tapes for all 1995 candidates reveals in fact that a substantial number of nurses located within Australia purposely delay taking the test - accepting nursing assistant or other work for income support, while accessing sufficient training or exposure to build up their English. In many cases, this strategy is combined with a desire to see family well settled (following the extreme upheaval of migration). The following cases are typical. A Chinese candidate in North Queensland delayed taking the test for 7 years while caring for four young children - concerned that she had intractable problems with English. A Bosnian woman in Perth dedicated her first two years post-arrival to intensive study of English, recognising her skills had to be sophisticated enough for at least a year's nursing study. A Russian nurse - marooned in rural NSW through family-sponsored migration - 'lost' two years, with no scope

to enrol in English courses. ("I just sit on farm. It was a hard time.") She taught herself laboriously from TV - supplemented by rudimentary lessons procured from her son's primary school teacher. Reaching Sydney, this nurse located cleaning work in a hospital while completing three General English courses in turn, determined to reach a sufficient level to access a preparatory OET course for nurses. A Colombian nurse attempted the OET following 6 years residence in Australia - working in a factory while studying English.

Following a pass in all four OET tests, the great majority of such nurses are further obliged to complete a three month pre-registration course - one entailing substantial hospital placements, including an 'in situ' assessment of their communicative as well as clinical competence. By the time migrant nurses have achieved professional registration, therefore, their English ability is, in theory, strong. Despite this a recent survey of 1300 migrant nurses who have secured Australian work suggests many continue to face language challenges - particularly in the initial employment period. While the majority feel their bilingual/bicultural skills offer a distinct advantage in dealing with Australia's multicultural patient base, newly registered nurses report a persistent need for:

- Greater training in Australian professional terminology, including the pharmacology and local medication brands related to specialist as well as general fields of nursing;
- Improved ability to communicate with staff and patients, both in person and over the phone - in particular to be understood during critical nursing communicative events, such as 'handover' briefings in relation to patients;
- In terms of literacy, the capacity to reproduce the style of Australian nurses' notes, including relevant use of abbreviations (untarnished by errors in spelling);
- In relation to all language skills, training in the Australian social and medical idiom widely in use, and perceived as fundamental to local professional acceptance.

Aside from differences related to field, the correlation between the barriers reported by NESB engineers and nurses is striking. In terms of nursing, moreover, a feature of both the large-scale survey and the follow-up qualitative interviews conducted is the degree to which well-established NESB nurses consider they remain at

persistent linguistic disadvantage in Australia - including nurses from countries such as Malaysia or the Philippines characterised by a high degree of English exposure. Beyond the initial settlement period, 'language' problems appear strongly linked to the degree of acceptance afforded by Australian colleagues, and to be cross-cultural as much as linguistic in nature. The comments below give some flavour of survey responses - in a number of cases made by Asia-born nurses qualified in Britain, and already working 10 years or more in Australia:

"Difficulty to express in word and writing, hard sp(eaking) when excited" (Malaysian).

A few.. still unable to understand my speech - or is it skin colour? Most people I meet say I've lost my Asian accent" (Malaysian).

"Because you were not white, or spoke with an accent, was already a stigma" (Malaysian).

"I had to adapt with the British medical terminology and pharmacology, Australian slangs" (Filipino).

"My English spelling isn't the best and some colleagues make remarks - putting one down" (Romanian).

Strong confirmation of this comes from Australian academics involved in provision of nursing bridging programs, who have the added advantage of observing migrant nurses in the field. According to Menon (1992: 328), pronunciation differences may cause significant problems, with 'word endings ... not clearly enunciated... consonants.. not strongly sounded, and... the syllables in the words not clearly stressed'. Such problems negatively impact on communication with Australian nurses, who rarely persist with 'difficult' conversation: ('They became restless, they changed the subject or they interrupted so that they could speak instead.') On the wards moreover, two clear types of Australian 'nurse talk' are observed: 'clear, fairly direct and factual' communication, with which NESB nurses can cope, and a second level representing 'a highly complex, conceptualised stream of ideas, concepts and technical jargon mixed up with miscellaneous... ideas delivered in a fast automatic style' (1992: 330-1).

In Menon's experience, few NESB nurses are initially able to cope with the latter (see authentic speech sample below) - ensuring a humiliating public 'collapse' in their communicative effectiveness.

'There're 4 new H&Ms in room 5 with Christmas trees all running on time, sequence of TPN is ordered on the FBC and we're expecting the anaesthetist to come and organise the Minnesotas at the end of the list today. They've had FBEs and blood for cross-matching and are on routine obs. The social worker's coming to sort out that placement I mentioned in room 4 and I don't think you need to worry about the relatives on Mr P but you will need to check his IV' (Australian nurse speech sample, 1992: 331).

They can expect little sympathy in this, since few Australian clinicians recognise the complexity of their language use, including their degree of reliance on jargon, abbreviation and idiom. A number of applied linguists (eg Race 1980; RMIT TAFE 1993) have attempted to 'unpack' nurse language use - recording a range of authentic speech samples in wards in order to identify and teach essential speech functions related to contexts such as admission interviews, ward handovers, elicitations of patient history. Alongside this process, there is systematic teaching of vast lists of formal medical terms (eg hydronephrosis, epispadias, dysuria, aliguria) - typically unknown to NESB nurses unless they studied their discipline in a Latin-based language. Beyond such terms there is the need to teach the great range of modifiers used to describe conditions like pain - ranging from 'throbbing', 'pulsing', 'intermittent' (etc) to 'transient' and 'acute'. Further, there remain the multitude of linguistic adjustments required for effective cross-cultural communication in professional settings. Nurses failing to acquire such skills risk being labelled rude, abrupt, or even obsequious - an issue of immense concern raised by respondents to the survey.

Problems with language use persist through the years - despite the fact that the majority of NESB nurses assert unique strengths associated with their 'outsider' status - strengths, in the view of many, which particularly fit them to nurse within a multicultural Australia. Many emphasise the value of their own linguistic and cultural skills, particularly where these match the needs of NESB patients.

"Ability to speak languages, translating and interpreting; understanding the importance of cultural background when nursing, caring for ethnic people..."

"I understand and am able to be of help to Asian patients..."

"Being multilingual makes me a better communicator..."

"I can always help with translating - Russian or Hebrew; to look after patients with Jewish faith, eg eating kosher..."

For some NESB nurses, the issue is the shared empathy which comes from the status of outsider, regardless of the degree of match between ethnic background. ("I can relate better to clients from other backgrounds as I myself have experienced feelings and attitudes they have dealt with"; "The patience to listen to multicultural patients who can't express themselves well. The tolerance with multicultural behaviour and customs.") For others there is the personal flexibility born of years of training and adaptation to different systems of nursing. ("Coming from Singapore I'm more work-oriented and conscientious. My overseas training in Britain and experience gave me great adaptability"; "The ability to assimilate quickly in the face of adverse conditions"; "Open mind, need to be ready to apply knowledge differently and communicate other options to rest of workplace".) Many of the nurses surveyed believe they combine all three skills. They contend they have much to offer Australia, despite the persistent charge of linguistic limitations. The skills they claim are indeed precisely those called for in a succession of government reports - essential pre-requisites, it is claimed, for effective nursing in a multicultural Australia.

Conclusion

Given findings such as the above, the task confronting designers of ESL tests for skilled NESB migrants remains multi-faceted and daunting. Professional employment for nurses and engineers in contemporary Australia demands an impressive facility in English, supported by field-specific communication skills, mastery of specialist terminology and jargon, and a subtle knowledge of appropriate genres of speaking and writing. Despite this, test designers are endowed with very limited resources for the research process. They have minimal capacity to produce occupation-specific tests which take a genuine account of issues such as cross-cultural effectiveness and field specialisation.

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