SKILL FORMATION IN THE CONSTRUCTION INDUSTRY: SOME KEY ISSUES

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In November 1992 the University of Technology, Sydney (UTS) and the National Centre for Vocational Education Research (NCVER) started a research project to review skill formation practices in the construction industry. The researchers were Geoff Hayton, John Garrick and Hugh Guthrie. The project was commissioned by the Construction Industry Development Agency (CIDA) as part of its brief to promote reform of the construction industry. The aims of the project were:

- to describe and evaluate current skill formation practices in the construction industry, particularly the practices on large construction projects;
- to assess the likely and desirable effects of the Carmichael and Finn reforms to entry level training on the construction industry.

The focus of this study was the link between workplace reform and skill formation in the construction industry, particularly for large construction projects. We use the term construction in this study as including non-residential building construction and non-building construction (such as civil construction) but excluding house building and residential building construction. Skill formation in the housing and residential construction sector was thus excluded from this study but is the focus of other recent studies.

This study sought to provide a strategic view of current skill formation in the construction industry in relation to workplace reform, with an explanation of important concepts and issues. Complementing this study are other recent studies which have provided a detailed analysis of future skill needs and training arrangements for the construction industry. Such studies include one commissioned by the Building and Construction Industry Employment and Training Council (Western Australia) and a study commissioned by the Construction Industry Training Council (Queensland).

Our study involved collection of statistics, reviewing recent reports, interviewing industry leaders and conducting case studies of major construction projects in Victoria, New South Wales and Queensland. The project team was guided by CIDA’s skill formation committee.

The case studies were chosen to provide insights into some of the practices of skill formation and workplace reform. They help to provide examples of and depth to the generalisations drawn in this report. Each project was selected because it was innovative or exemplary in some aspect of skill formation. None was a perfect model. Like the whole of the construction industry, the projects have only partly attained world best practice in skill formation and workplace reform.

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1 See for example Greig 1992.
2 BCIETC (WA) 1993.
CIDA has also commissioned a project to identify desirable future skill formation practices for the construction industry. The outcomes of both projects will provide CIDA with a basis for developing recommendations on how to move from the present to the desirable future.

The 100 page report of this project, to be titled Learning Construction, will be published by CIDA in July 1993. The report's six chapters cover:

- overview of the industry;
- current education and training;
- the relationship between workplace reform and skill formation;
- reform in the construction industry;
- case studies;
- summary of main findings.

For the remainder of this paper we will highlight just three of the many issues that emerged in the project, these being:

- the definition of skill formation and concepts of formal and informal learning;
- in-house training in the construction industry, and in particular, the structuring of work-based learning;
- language and literacy issues in training in the industry.

What is skill formation?

Our definition of skill formation, on which this review was based, is the definition adopted by CIDA:

skill formation is the means by which all those in the industry are empowered to participate in the continuing development of work organisation, structures and processes and contribute towards attaining enterprise objectives.

In this definition the means could include education and training programs (both external and in-house), the implementation of training policies and systems within an enterprise, and the active learning environment provided by the interaction of individuals and teams with people and construction processes. All forms of learning, both formal and informal, are included in this definition. Learning environments within an enterprise may be divided into three types:

- structured and active learning environment - learners, who have responsibility for their own learning, learn by planned and structured interaction with people, knowledge and experience, using problem solving and inquiry;
- structured and passive learning environment - learners receive 'deposits' of information, like banks receive money;

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• chaotic learning environment - learning is not actively encouraged and
learners learn things by accident or informally.

It is important to note that learning that occurs in an informal setting, such as at the
workplace, could be classed as ‘structured and active learning’. For example, a
planned workplace program of work experience and coaching of a worker by an
expert would mostly be ‘structured and active’. While some would regard such
learning as ‘informal’, we would classify any learning that occurs through a planned
program of skills development as formal learning, even when it occurs in informal
settings. Research indicates that natural settings such as the workplace provide the
optimum environment for vocational learning, because of the attributes of
authentic equipment and activities and access to experts. 7 Recognising the value of
workplace learning, however, does not mean that off-the-job learning should be
undervalued.

The potential of structured learning at the workplace is largely untapped in the
construction industry. There appears to be two reasons for this. Firstly, statistics
presented our report indicates that there is relatively little structured learning at the
workplace in the construction industry in Australia. The main form of structured
workplace learning in the industry is the on-the-job component of trade
apprenticeship training. However, even here many in the industry expressed doubts
about the quality of such training. In many cases it is not carefully planned and
managed. A second problem is the lack of formal recognition of such learning.
Generally, only on-the-job training associated with trade training
is
formally
recognised. An industry wide system of competency assessment at the workplace is
to be implemented this year, so it is expected that this will address the problem of
industry-wide recognition of workplace learning.

A problem encountered in the case studies was the various interpretations by those
interviewed of the term informal learning. This problem is understandable since
there is a lack of agreement on the distinction between formal and informal learning
in the literature. The concepts of formal and informal learning require clarification
and development. We believe that skill formation in the construction industry
would be enhanced if the value of learning in informal settings, and the variety of
approaches to learning at the workplace were more widely understood.

An illustration of an effective approach to workplace learning is provided by the
Darling Park project, one of the case studies in this study8. Mentoring or coaching is
usually provided by Work Area Team leaders. Although the learning is regarded by
Civil and Civic as ‘informal’, learning is structured through job rotations and a
defined coaching role for team leaders, and there is formal assessment and

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construction industry: Volume 2: Case Studies. Sydney: Construction Industry Development
Agency.
recognition of skills by the enterprise. In a recently published book the coaching role has been described as including:

- time set aside to discuss procedures and sharing of experiences related to aspects of jobs or tasks;
- regular opportunities to observe others at work;
- feedback on performance;
- the posing of problem scenarios;
- post-mortem sessions;
- project planning meetings;
- monitoring of practice and verification of competence. 9

Numerous recent studies 10 have shown that more effective and productive organisations have a structure and culture which provides a structured and active learning environment for its employees at all levels. Individuals, teams and the enterprise itself are continually learning to meet internal and external changes. This conception is often referred to as the learning organisation. It appears to be the goal of workplace reform in most industries, but few organisations have fully achieved this state. It requires conceptual innovation by the enterprise and a high degree of workforce participation in critical aspects of organisation development, including the development of skill formation. 11 In practice this could mean that all members of the workforce would share in some or all of the following:

- enterprise strategic planning;
- enterprise conceptual and cultural changes;
- workplace reform strategies;
- development of skill formation (e.g. preparing learning modules);
- development of new work organisation.

In this view of skill formation a key concept is empowerment. The term empowerment implies that all employees of the enterprise, especially those at operative level, are given more power and choice in the work of the enterprise and greater opportunities for learning. 12 It means more autonomy for individuals and teams, and greater individual and team responsibility for production, construction, quality and safety objectives. This is achieved by people in the organisation being enabled to:

- unlearn their deference to authority and understand the social and political processes within the organisation that negatively affect their lives;
- be nurtured in this process by a mentor, coach or friend;
- exercise their new understanding and competencies through progressively increasing responsibility;
- learn within a supportive organisational framework of interdependence and mutuality.

An early step towards empowerment could be the establishment of a system of recognition of the learning of individuals and teams. The system could be enterprise-specific and/or industry-wide. The construction industry skills framework, described in a later section, is an industry-wide approach.

Another early step implicit in the moves towards empowerment is the development of new learning roles in the re-organisation of work for managers, supervisors, professionals, technicians and workers. This change is at the heart of workplace reform moves in Australia and many other countries.

**In-house training**

We define in-house training as training organised by employers primarily for their employees. It could include training conducted at an off-site location, and training conducted by an educational institution which has been organised by an employer for their employees.\(^{13}\) An example of this is a two day workshop conducted by a university for employees of a particular construction firm.

In-house training may comprise one of the following forms:

- **instruction**: training to a structured plan and format, and primarily involving periods of instruction, such as workshops, lectures, tutorials, audio-visual presentations, demonstration sessions and monitored self-paced learning packages;
- **instruction and practical**: combination of periods of instruction and structured and monitored practical work at the workplace;
- **structured practical**: structured practical work at the workplace;
- **unstructured practical**: unstructured practical work at the workplace.

The last three categories which include practical work at the workplace may or may not have a coach or mentor to help the learner. In the Employer Training Expenditure Survey the Australian Bureau of Statistics defines only the first two categories as *formal*, and does not collect data on the last two categories.\(^{14}\)

The construction industry's investment in skill formation through in-house training is very low, both in absolute terms and relative to other industries. For the three months July to September 1990 the average expenditure on in-house training in the construction industry was $58 per employee, equivalent to 0.8% of gross wages.\(^{15}\) Of all industries, only recreational, personal and other services was lower at $38 per employee, and the construction industry was lowest overall in terms of percentage of gross wages. The average for all industries was $112 per employee (1.8% of gross wages).

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15 These statistics include instruction and combinations of instruction and monitored practical. They exclude expenditure on monitored and un-monitored practical. Australian Bureau of Statistics 1990.
Most of the in-house training effort in the case study projects appeared to be focused on formal instruction, usually at a training centre on or near the site. The training systems for this were sophisticated. Curricula were developed at most sites. Some of the training modules were self-paced with student learning materials developed by the enterprise and available to each student. There was a wide range of methods of instruction. Formal assessment at the end of the instruction was undertaken in some courses, but mostly this was absent. The training was usually available for employees of both the contractor and subcontractors.

In-house instruction in the case studies was mostly conducted by staff of the principal contractor. Other instructors included private consultants, university lecturers and TAFE teachers. For both course development and instruction the use of experts from the construction site was generally preferred in the case study projects. The reasons for this were credibility with the workers and the development of training and coaching skills within the organisation.

There is recognition of the need to use external expertise on some occasions. A recent survey in NSW found that 12 of 34 construction establishments surveyed would be interested in joint training ventures with TAFE. However, many in the construction industry (66% of respondents, the highest of any industry) see barriers to close links with TAFE. The many barriers cited include: ‘TAFE lacks flexibility’ and ‘past contact with TAFE was poor’. Similar views were found in the case study projects. There were clear feelings of wariness in using TAFE’s services in all of the case study projects. Examples of the views expressed in Queensland, New South Wales and Victoria are:

- “TAFE teachers do not appear to be interested in coming out to run site based training” (NSW)
- “the commercial rates that TAFE charges are too expensive” (NSW)
- “to get TAFE involvement in the rigger/dogman training we had to negotiate with many people. We only succeeded because the Senior Head Teacher at the local college was enthusiastic and found a ‘back door’ way of locating a teacher on site” (NSW)
- “experience at this site suggests that the workers are not inclined to attend off-site training activities and this has lead to changes in the way TAFE teachers operate and liaise with the site” (QLD)
- “TAFE teachers need to come out to the site when the training needs to happen” (QLD)
- “TAFE teachers and colleges have to respond quickly too. If they can’t they will be increasingly left out” (QLD)
- “there is little demand for off-site courses offered in TAFE” (VIC)
- “TAFE has offered us the use of the library resources and videos, but TAFE’s fee-for-service charges are excessive” (VIC)

While the case study projects cannot be said to represent the whole of the industry, the data suggest that at least a section of the industry is very dissatisfied with TAFE services. Most of the problems relate to TAFE's flexibility and ability to be involved in on-site training, and are not limited to a single TAFE system although TAFE in some states is perceived more favourably than others.

Nevertheless some exemplary practices of TAFE services and programs for the industry were cited by some of those interviewed. This suggests that a study of such innovations and their factors for success could provide a useful guide to future TAFE policies and programs for the industry. An example of TAFE responding quickly and flexibly, in partnership with industry and the National Building and Construction Industry Training Council (NBCITC), is the recent development of the Build a Job program.

The approach based on a combination of instruction and practical was not extensively used in the case study projects. The most common combination was attendance at a TAFE college for a trade certificate course combined with on-the-job practical experience at the workplace, through the apprenticeship arrangements. The quality of apprenticeship training depends on three main features:

- the quality and relevance of TAFE instruction;
- the quality of on-the-job training arrangements;
- the extent of integration of TAFE and practical work based learning.

The last two features concern in-house practical learning and these are primarily the responsibility of the employer. Many people in the industry believe there is much room for improvement in these areas. Construction Skills Training (Vic) expressed the view that...

... the structured nature of [the apprenticeship work based] learning process leaves much to be desired.17

Other than working alongside skilled and experienced workers, work based learning by apprentices in the construction industry is mostly unstructured. There are some good examples of structured work based learning, such as group apprenticeship schemes18, but these are not the norm for the industry. Suggestions for structuring work based learning to improve its effectiveness include:

- planned job rotation;
- curricula and learning support materials for the on-the-job component of training;
- allocation of a work based mentor and/or coach for each apprentice;
- on-the-job assessment of skills or competencies;
- recording and formal recognition of skills or competencies acquired through work based learning.

17 Construction Skills Training (Vic) 1992, p.28.
18 An example of structured work based learning is the Plumbing Industry Group Training Scheme in Victoria. Apprentices employed through the scheme have an individual structured training program designed for them, and they are rotated through various employers and fields of plumbing.
Information collected from the case studies and interviews suggests it is common in the construction industry for none of these measures to be taken in support of apprenticeship training. The industry is a long way from getting an effective structured work based learning system of apprenticeship training which is applied throughout the industry. However, models of good practice do exist, and some are described in this report.

For other areas of work based learning outside of trade apprenticeship training, the situation is similar. The practice of structuring work based learning appears to be very uncommon. While there are no national statistics on the incidence of structured work based learning, the case study projects in this study provided few examples of this practice. Notable examples of structured work based learning were found at the Darling Park project and the Kraft project. An important feature in both cases was the allocation of mentors to facilitate workplace learning and job rotations.

Language and literacy issues in training

Surveys of the building and construction workforce indicate that many of the workers were born overseas, and less than a quarter have English as their first language\(^\text{19}\). A survey in the Australian Capital Territory revealed that 70% of building and construction workers could not read a plan, and 30% of these were TAFE qualified tradespeople\(^\text{20}\).

This suggests that education and training, both in-house and external, needs to be language and literacy sensitive if it is to be effective for a large proportion of the workforce. It also indicates a need for language and literacy training programs to be developed and offered. Although English language skills and low literacy levels have been an issue in the industry for some time, current workplace reform initiatives have exposed the extent of the issue. The introduction of semi-autonomous teams (e.g. Work Area Teams), the tightening of building specifications and tolerances, the increased concern for quality, and the increased concern for occupational health and safety, are areas where there are increased demands for good English language and literacy levels.

The National Building and Construction Industry Training Council, and its state industry training bodies have developed programs to address these needs. Key programs being implemented or proposed include:

- development of communications modules for CW1 to CW4\(^\text{21}\);
- development of a package to assist writers of on site learning materials;
- implementation of an on-site training strategy funded by government.

\(^\text{19}\) See for example Construction Skills Training (Vic) 1992, p. 61.

\(^\text{20}\) Information from the national office of the Construction, Forestry, Mining and Energy Union.

\(^\text{21}\) The Construction Worker (CW) skill levels range from CW1 to CW9 and have been defined by the industry as part of the process of award restructuring.
Language, literacy and numeracy have been integrated into technical modules in the CW1, CW2 and CW3 training modules recently developed, and also constitute separate self-paced modules in CW1 up to CW3. The Construction, Forestry, Mining and Energy Union has also conducted English language programs for adult workers at building sites, with the support of employers.

The value of integrating language and literacy learning with learning of technical skills also has been recognised. An integrated approach to language and literacy learning was implemented in one of the case study projects: the construction of a high rise office building at 111 George Street, Brisbane by Leightons. At this site the literacy programs developed by TAFE were modified so that literacy skills training and technical skills training were integrated in a single course. It was believed that many of the workers would be unwilling to attend language or literacy skills training alone. The integrated course at the site was well attended and was regarded as very successful.

The importance of addressing these issues in approaches to skill formation has recently been stressed by the Centre for Workplace Communication and Culture in Sydney. Key elements of workplace reform in the industry, such as the Mayer key competencies, team building, trust and communication centrally involve language. It is argued that for skill formation to be effective in these domains (particularly with workers from non-English speaking backgrounds), the language demands in training need to be made explicit.22

References and further reading


22 Joyce, H Scheeres, and D Slade 1993.


