MULTISKILLING AS A RESPONSE TO GLOBALISATION

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ABSTRACT

Globalisation implies that international competitive forces raise the degree of competition in the local construction industry of a country. Given that the majority of projects in Hong Kong are awarded on a competitive bid basis [the traditional procurement system], the scope for main contractors to gain a competitive edge is very narrow. Costs of materials and plant are the same or similar between competitors. The opportunity for cost reduction lies with the management of labour cost. Hence, improvement in labour productivity can provide the necessary competitive edge. Multiskilling can improve productivity and thus be an appropriate response to globalisation. This research presents the findings from survey and interviews conducted with various industry participants in order to evaluate the potential benefits, impediments, limitations, and applicability of multiskilling. Results indicate that benefits are likely to both the workers and projects. However, contrary to earlier findings, quality and safety may not improve. In Hong Kong, major impediments exist, such as worker resistance and high training costs. These can be overcome in the long term through a process of continuing improvement, and so benefit the industry image. Thus, Hong Kong does not match experience in other countries in every respect, and this knowledge may be useful to other countries.

Keywords: construction labour, globalisation, multiskilling, productivity, training

INTRODUCTION

As contractors seek to be competitive in the face of international business trends, attention to all aspects of a business needs to be made. Cutting of labour costs is key to survival, especially when other costs are less controllable, since many of non-labour costs are attributable to suppliers of materials and plant. Given that the majority of projects in Hong Kong are awarded on a competitive bid basis [the traditional procurement system], the scope for main contractors to gain a competitive edge is very narrow. Costs of materials and plant are the same or similar between competitors. The opportunity for cost reduction lies with the management of labour cost. Hence, improvement in labour productivity can provide the necessary competitive edge. Multiskilling can improve productivity and thus be an appropriate response to globalisation. This paper draws on the work of an empirical study by [Yuen (2003)] which examined the potential for multiskilling in Hong Kong. The study set out to evaluate the potential benefits, impediments, limitations, and applicability of multiskilling. Lessons from this study are
relevant to other countries also facing competitive pressures from globalisation. In the analysis of the data and discussion, the authors have considered the issues raised from the point of view of the workers, the projects and the industry as a whole.

According to [Burleson et al. (1998)], a multiskilled construction trade worker is “an individual who possesses or acquires a range of skills and knowledge”. The workers are assigned to construction tasks based on their ability to perform the needed skill or task unrestricted by traditional job descriptions or work boundaries [Burleson, (2002)]. The workers may have a primary craft in which they are highly proficient, but their role on a construction projects is not limited to that craft. It should be noted that it is not necessarily that the worker should possess mastery level skills in multiple trade areas. However, the worker should be productive and effective in the trade disciplines other than his or her primary trade.

The paper briefly reviews previous studies, before describing the results of field work in the Hong Kong context.

**PREVIOUS WORK IN LITERATURE**

Much research has been performed to attempt to identify the potential benefits of multiskilling. Statistically, previous research demonstrated the benefits of multiskilling would be a potential 5-20% labour cost saving, a 35% reduction in required total hires, a 47% increase in average employment duration for workers per project, and an increase in earning potential for multiskilled workers [Burleson, 1998]. Practically, the benefits can be grouped into three levels: worker level, project level and industry level.

**Worker Level**

Previous research indicates that construction workers benefit from multiskilling labour strategies. The majority of the findings show worker benefits come from construction applications with multiskilled labour strategies.

Carmichael and [MacLeod, (1993)] pointed out the job security of a multiskilled worker is higher than the single-skilled one. Besides, they can participate in many types of project, thereby avoiding the necessity of relocating to different areas because they can work at one location at a number of trades [Haas et al, (1998)].

In the long term, multiskilled workers gain benefits also. Job satisfaction and happiness has been increased among the multiskilled workers as they can gain exposure to a wider variety of craft and need not to face the same kind of job all the time [Haas et al, (1998)]. Another long-term benefit was found by [Burleson, (2002)]. She suggested that multiskilling gives workers more possibilities to advance and develop a career path. They can improve their opportunities of remaining steadily employed within the same geographic region. Therefore, there would be an increase in average employment duration of craft workers.
Combining the above benefits, multiskilling makes the workers more competitive and marketable because workers stay longer on a project and a more flexible utilization is possible.

**Project level**

The use of multiskilling strategies may reduce many of the problems associated with traditional single skill employment strategies. One of the major benefits of using multiskilling in construction is monetary savings [Haas et al., (1998); Tam et al., (2001)]. It was shown [Haas et al. (1998)] that multiskilling can lead to increased productivity as multiskilling leads to more efficient use of time on construction sites, affects the attitude of workers and increases the desire to perform. Carmichael and MacLeod [1993] also demonstrated that there would be a significant savings in project labour costs after implementing multiskilling. Related research has confirmed the positive impacts of multiskilling on projects such as improved quality and safety together with the added flexibility available to project managers in assigning tasks [Williamson, (1992)]. Stewart (1999) found that after implementing multiskilling, the tradesmen generally improved their knowledge of work, leading to better understanding of integrated construction activities. For example, a carpenter with experience of installing conduit would be more sensitive to the impact of his work on an electrician.

**Industry Level**

Multiskilled labour utilization strategies may provide increased opportunities for the development of process innovations and technology implementation [Tatum, (1989); Nonaka, (1990); Ettlie and Rezo, (1992)]. This is important when the industry wants to increase the marketability of local construction firms. The lack of innovation or advanced technology would reduce the competitiveness of local firms. The implications are also that multiskilling may have some other significant industry impacts. For example, the industry would hold greater appeal to young workers because of the development of career-type employment opportunities. It is particularly important to the construction industry in the meantime, as it has hitherto encountered difficulty in attracting new blood and in retaining those who have joined the workforce [Hong Kong (China), Construction Industry Review Committee, (2001)].

**METHODOLOGY**

Three primary sources of information were used in this research: literature, questionnaire survey and interviews. Full details of the method are given in Yuen (2003) and only a brief account is given here.

The first stage of this research was a literature review based on previous studies of multiskilling applications in the construction industry of other countries in order to familiarize with the practical experience. Articles relating to multiskilling, human resources management, and construction labour management were examined.
Second, a questionnaire survey of main contractors was executed. There were 317 questionnaires sent, with 54 responses, giving a response rate of 17%. The respondents were requested to score, according to a five-point Linkers scale, 22 potential benefits of multiskilling (see Table 1) and 9 barriers to implementation of multiskilling (see Table 2). Main contractors were viewed as being the most knowledgeable about and experienced with multiskilling. They have close relationships with their sub-contractors, as well as with their directly employed workers.

Third, a series of interviews was conducted with representatives of five stakeholders, i.e. the government bodies, the training authorities, the unions, the contractors and the industry development groups, representing different points of view.

Data Analysis

Of the three groups of main contractors Groups A, B and C of the Government classification for Registered Contractors, the numbers of respondents were fairly balanced between these groups. Almost 75% provide training to their trade workers, and 45% also train their subcontractors. Table 1 shows the responses concerning the potential benefits of multiskilling.

<table>
<thead>
<tr>
<th>Item</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Project level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity can be increased</td>
<td>0</td>
<td>3.7</td>
<td>51.9</td>
<td>33.3</td>
<td>11.1</td>
<td>100</td>
</tr>
<tr>
<td>Safety problems can be improved</td>
<td>0</td>
<td>14.8</td>
<td>59.3</td>
<td>25.9</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td># of workers from different trades can be reduced</td>
<td>0</td>
<td>14.8</td>
<td>29.6</td>
<td>40.7</td>
<td>14.8</td>
<td>100</td>
</tr>
<tr>
<td>Continuity of workforce can be achieved</td>
<td>0</td>
<td>11.1</td>
<td>18.5</td>
<td>55.6</td>
<td>14.8</td>
<td>100</td>
</tr>
<tr>
<td>Flexibility in job assignments can be increased</td>
<td>0</td>
<td>11.1</td>
<td>0</td>
<td>51.9</td>
<td>37.0</td>
<td>100</td>
</tr>
<tr>
<td>Quality of the work can be increased</td>
<td>0</td>
<td>18.5</td>
<td>55.6</td>
<td>25.9</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Cost of personnel dept. can be reduced</td>
<td>0</td>
<td>22.2</td>
<td>29.6</td>
<td>44.4</td>
<td>3.7</td>
<td>100</td>
</tr>
<tr>
<td>Reduce idle time between trade interfaces</td>
<td>0</td>
<td>0.7</td>
<td>25.9</td>
<td>44.4</td>
<td>25.9</td>
<td>100</td>
</tr>
<tr>
<td>Less supervision (prompt decision making)</td>
<td>0</td>
<td>29.6</td>
<td>48.1</td>
<td>18.5</td>
<td>3.7</td>
<td>100</td>
</tr>
<tr>
<td>Less rework</td>
<td>0</td>
<td>22.2</td>
<td>48.1</td>
<td>29.6</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>b) Worker level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The employment duration can be increased</td>
<td>0</td>
<td>7.4</td>
<td>18.5</td>
<td>63.0</td>
<td>11.1</td>
<td>100</td>
</tr>
<tr>
<td>The # of moves from employer to employer can be reduced</td>
<td>7.4</td>
<td>7.4</td>
<td>25.9</td>
<td>48.1</td>
<td>11.1</td>
<td>100</td>
</tr>
<tr>
<td>The # of moves between projects can be reduced</td>
<td>0</td>
<td>11.1</td>
<td>37.0</td>
<td>40.7</td>
<td>11.1</td>
<td>100</td>
</tr>
<tr>
<td>Marketability can be increased</td>
<td>0</td>
<td>0</td>
<td>25.9</td>
<td>66.7</td>
<td>7.4</td>
<td>100</td>
</tr>
<tr>
<td>Earning potential can be increased</td>
<td>0</td>
<td>3.7</td>
<td>25.9</td>
<td>59.3</td>
<td>11.1</td>
<td>100</td>
</tr>
<tr>
<td>Better understanding of different trades</td>
<td>0</td>
<td>3.7</td>
<td>14.8</td>
<td>63.0</td>
<td>18.5</td>
<td>100</td>
</tr>
<tr>
<td>Workers would have higher security of their job</td>
<td>3.7</td>
<td>0</td>
<td>22.2</td>
<td>63.0</td>
<td>11.1</td>
<td>100</td>
</tr>
<tr>
<td>The variety of job can be increased</td>
<td>0</td>
<td>7.4</td>
<td>22.2</td>
<td>63.0</td>
<td>7.4</td>
<td>100</td>
</tr>
<tr>
<td>Greater opportunities for advancement</td>
<td>3.7</td>
<td>3.7</td>
<td>22.2</td>
<td>51.9</td>
<td>18.5</td>
<td>100</td>
</tr>
<tr>
<td>Job satisfaction and quality of working life can be increased</td>
<td>0</td>
<td>3.7</td>
<td>25.9</td>
<td>51.9</td>
<td>18.5</td>
<td>100</td>
</tr>
<tr>
<td>c) Industry level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of new entrants to the industry can be increased</td>
<td>3.7</td>
<td>18.5</td>
<td>48.1</td>
<td>25.9</td>
<td>3.7</td>
<td>100</td>
</tr>
</tbody>
</table>
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The competitiveness of local contractors can be increased 7.4 3.7 44.4 33.3 11.1 100

KEY: SD=Strongly Disagree; D=Disagree; N=Neutral; A= Agree; SA=Strongly Agree

### Table 2. Barriers to Implementing Multiskilling [percentages of responses]

<table>
<thead>
<tr>
<th>Item</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult to change the current traditional industry practice</td>
<td>3.7</td>
<td>0</td>
<td>11.1</td>
<td>59.3</td>
<td>25.9</td>
<td>100</td>
</tr>
<tr>
<td>High training cost for single skill employees</td>
<td>3.7</td>
<td>11.1</td>
<td>22.2</td>
<td>44.4</td>
<td>18.5</td>
<td>100</td>
</tr>
<tr>
<td>Increase in wages to multiskilled employees for the additional skills</td>
<td>3.7</td>
<td>11.1</td>
<td>22.2</td>
<td>44.4</td>
<td>18.5</td>
<td>100</td>
</tr>
<tr>
<td>Change in construction management system is caused</td>
<td>0</td>
<td>14.8</td>
<td>48.1</td>
<td>33.3</td>
<td>3.7</td>
<td>100</td>
</tr>
<tr>
<td>Workers’ reluctance to learn new skills</td>
<td>0</td>
<td>14.8</td>
<td>37.0</td>
<td>40.7</td>
<td>7.4</td>
<td>100</td>
</tr>
<tr>
<td>Resistance from old employees</td>
<td>0</td>
<td>7.4</td>
<td>25.9</td>
<td>40.7</td>
<td>25.9</td>
<td>100</td>
</tr>
<tr>
<td>Difficult to estimate and sub-contract out</td>
<td>3.7</td>
<td>29.6</td>
<td>44.4</td>
<td>7.4</td>
<td>14.8</td>
<td>100</td>
</tr>
<tr>
<td>The more complex the trade, the less suitable it is for Multiskilling</td>
<td>3.7</td>
<td>7.4</td>
<td>33.3</td>
<td>33.3</td>
<td>22.2</td>
<td>100</td>
</tr>
<tr>
<td>Union resistance</td>
<td>14.8</td>
<td>18.5</td>
<td>44.4</td>
<td>11.1</td>
<td>11.1</td>
<td>100</td>
</tr>
</tbody>
</table>

Comparing the benefits at the three levels of analysis (worker, project and industry), results indicate that construction workers benefit most from multiskilling labour strategies as nearly all the benefits listed in this part achieved more than 70% agreement from the respondents. The benefits can be grouped into two major categories: economic benefits and motivational benefits.

Construction workers can gain economic benefits because of the increased employment duration, reduced number of job relocations to find work, increased marketability and increased earning potential.

Over 70% of the respondents agreed that through the increased training in other trades, the multiskilled workers are capable of performing different types of work and can perform work in different phases of projects which allows them to have longer employment duration. Another economic benefit of multiskilling that is closely related to increased employment duration is the reduction in the number of moves and relocations needed for a worker to find works. If multiskilling affords workers the opportunity to work longer on the projects, the worker will experience fewer periods of non-work from layoffs or firing which will reduce the periods of no income for the worker. Only half of respondents agreed that there would be increased income because workers are able to work more hours in a given year.

Results also indicate that multiskilled employees are more marketable than single skilled employees, as employers would rather hire a person who can do a variety of tasks than a person who can only perform one task. No one disagreed that multiskilling allows workers to be more marketable in the industry.

Over 70% contractors indicate that multiskilling can increase the earning potential of the construction workers. It can be concluded that most of the contractors willing to pay a
higher wages to a multiskilled worker than the single skilled one. This result is understandable. When a worker can perform a variety of tasks, employers would be more willing to pay him/her higher wages. Even if the same wage was received, the lengthened employment duration enables the worker to earn more, as he can work more hours during a given year than his non-multiskilled counterpart. Thus, the earning potential is still increased.

Multiskilling not only provides economic benefits to the workers, but also motivational benefits. Under the current single skilled labour utilization strategy, most of the construction workers adopt a short-term view of business development, with little interest in enhancing their long-term competitiveness. With implementation of multiskilling, it is likely that workers would seek a sustainable career development. The motivational benefits include better understanding of different trades, increased security and task variety, and increased job satisfaction.

Through additional training for other trades, most of the contractors believe that workers can have better understanding of different trades. The result can be shown in the percentage of agreement which is as high as 81.5%.

A major motivational benefit to the worker is increased job security. More than two thirds of survey participants indicated employees could benefit from increased job security. The security would be provided by the flexibility of the multiskilled employee through his or her ability to work in several different trades.

For increased job variety, 70% of respondents agreed that greater opportunities for advancement exist, leading to increased job satisfaction. The underlying reason may be that multiskilling allows workers to perform a variety of tasks, so that their job opportunities will not be limited to one trade. The workers themselves may appreciate it because they get knowledge of more than one trade. Other benefits discussed earlier, such as increased earning potential and increased employment duration, also have a positive affect on the job satisfaction and happiness of the multiskilled employee.

Compared with the benefits discussed above, the benefits of reduction in the number of moves from employer to employer and between projects receive lower degree of support as both of the percentages are less than 60%.

At project level, 40% of the main contractors agreed the use of multiskilling leads to increased job site productivity. The increased flexibility in job assignment after implementing multiskilling is the most obvious and anticipated benefit. More than 85% contractors agree with the benefits of flexibility (over one third of respondents even strongly agree). For the continuity of workforce, there is also a higher percentage of agreement as more than 70% of the contractors agree with this item. For site safety and quality, the responses show both of these aspects are largely unrelated to multiskilling. Most respondents did not consider there were any savings in Personnel Department administration costs.

Compared with the other two levels, benefits at the industry level after implementing multiskilling are less obvious as the number of contractors who agree with the potential benefits in this area is less than half. Most of them remain neutral when talking about the
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Scores for better career development of workers together with the improved working condition, indicate that the industry will hold greater appeal to young workers. It is particularly important when the number of young workers can be increased through multiskilling so as ensure a steady supply of labour. However, while the potential benefits to workers as shown in Table 1 are obvious, more than two thirds of contractors are neutral or indicate that multiskilling cannot stimulate the growth of young workers entering to the industry.

Compared with the benefit of increasing number of entrants, the benefit of increasing the competitiveness of local contractors is less likely to be accepted by the respondents. When talking about the competitiveness of local contractors, the respondents can give most reliable results as they are the direct parties being involved. The percentage of agreement in this item is almost 45%. Even it is less than a half, it can be concluded that at industry level, the benefit of increasing competitiveness is more obvious and predictable.

Validation of the Questionnaire Survey

Comparing the questionnaire survey and the interviews, the results show some differences. Different parties would have different standing points and focusing areas. For the contractors, they would focus on profit and productivity while for some other industry stakeholders, they would focus the improvement of the whole industry. Although there are some differences in the comments about the potential benefits and impediments of multiskilling implementation, some points can be summarized.

Concerning the potential benefits, it can be concluded that workers benefit most from multiskilling, such as higher earning potential and better understanding of different trades. More importantly, multiskilling allows workers to have better long-term career development. At the project level, both the survey participants and interviewees agree the main advantage is increasing the flexibility in job assignment. For the industry level, it is not easy for the survey participants to identify industry benefits, but some of the interviewees believe multiskilling can improve the image of the industry by increasing the social status of the workers and increasing the confidence of public on building works.

Impediments and limitations to multiskilling implementation do exist. Most of the main contractors and other interviewees agree that the impediments include worker resistance and lack of training, but the most important barrier would be how to change the current industry practice which has been adopted for many years. Limitations include information overload and inapplicability in some areas, such as projects with stringent time constraints. Barriers can be overcome, but a certain period of time is required, through a continuous process.

DISCUSSION

Although there are many identified potential benefits, impediments and limitations as
identified in the literature, not all of them are suitable for the case in Hong Kong. The main differences between the findings and literature are outlined as follows.

**Potential Benefits of Multiskilling**

Most of the benefits identified in the literature research are found to be applicable in Hong Kong. Those potential benefits include 1) the increased flexibility in job assignment, 2) continuity of workforce, 3) reduced idle time between different trades and 4) reduced number of workers from different trades. At the worker level, the potential benefits identified from this study are similar to those found in the literature. However, some of the potential benefits seem to be not applicable in Hong Kong. They include:

- **Improved quality of work:** Benefits of multiskilling have been researched by Carmichael and MacLeod (1993) and Burleson et al. (1998). Improved quality of work is one of the significant benefits identified in the literature. However, the results of this study show that almost 75% of main contractors are neutral or disagree with this benefit.

- **Improved safety of work:** The potential for increased site safety through the use of multiskilling strategies is based on the literature. Past studies show multiskilled workers are more aware of the hazards of the other crafts around them, so they tend to perform better in the field of safety. Since they stay on the job through longer phases, they will have a better understanding of what’s going on. However, from the questionnaire survey and interviews, it can be expected the belief of improved safety is too optimistic as about 75% contractors are neutral or disagree with this potential benefit.

- **Reduced number of moves:** A reduced number of moves from project to project to find work is an economic benefit of multiskilling that is mentioned in the literature. Researchers from the University of Texas at Austin found that multiskilled workers can possibly experience longer durations in the present site so that the workers can stabilize in one location and reduce number of relocations of their family. This potential benefit is not applicable to workers in Hong Kong, since it has a small geographical area, and the distance between different sites is short. Workers live at home and travel each day. Also, the employment of directly employed labour by main contractors is a limited practice in Hong Kong (Tam et al., 2001). As a result, the number of moves between employers or between projects is not important to the workers.

- **Increased number of entrants to the industry:** Concerning about the benefits at industry level, [Burleson (2002)] believed that with the implementation of multiskilling, the industry would hold greater appeal to young workers because of the development of career-type employment opportunities. However, results from this study show that it may be difficult to achieve. In Hong Kong, the attraction for young workers to enter the construction industry in the short term is whether they can earn money or not. Career development is one of their considerations, but not the most important one. In the current situation, the unemployment rate is high, especially in the construction industry. Young workers will not normally consider entering the industry because of the lack of long-term career development.
Potential impediments of multiskilling

Similar to the benefits discussed, not all the impediments of multiskilling covered in the literature would also hinder the implementation in Hong Kong. Common impediments include worker resistance and training availability. The unique impediment in Hong Kong is the resistance from industry due to a change of the current traditional industry practice. For union resistance, research from other countries indicated it is one of the main barriers, however, it would not be expected in Hong Kong.

Limitations of multiskilling

Multiskilling provides a wide range of benefits, but there are still some limitations. Few limitations have been identified in the literature [Hass et al. (1998)], one being the problems of information overload. This same limitation would be expected in Hong Kong.

Applicability of multiskilling

From the literature concerning the implementation of multiskilling in Hong Kong, the Construction Industry Review Committee (CIRC) has pointed out multiskilling should be adopted to equip workers with a broader appreciation of their job requirements. On the other hand, some researchers, such as [Tam et al., (2001)] believed it is difficult to implement multiskilling in Hong Kong as the construction industry always comprises a group of skilled or semi-skilled craftsmen belonging to a very narrow division of craft.

Findings from the questionnaire and interviews indicate that multiskilling is applicable. From all questionnaire respondents, the average score of the overall potential is 3.19 (1=low; 5=high) and most of the interviewees indicate multiskilling is likely to be the future direction of manpower development. Although it is applicable, it is difficult to implement multiskilling. There are some impediments which make the implementation very difficult, such as worker resistance and high training cost, but they can be solved. The most important measure to overcome the barrier is the co-operation among the government, training bodies, employers and employees.

CONCLUSIONS

Studying multiskilling implementation in construction is motivated by its potential benefits identified by previous literature. Multiskilling strategies can benefit the worker. Potential benefits include longer employment duration, higher marketability and higher job security. Results indicate that workers can have both economic and motivational benefits. Multiskilling strategies can also be beneficial to construction projects. Research results indicate that multiskilling can increase the flexibility of job assignment, overall productivity and continuity of work, while reducing the idle time between trade interfaces. However, in this study, there is no evidence that implementation can improve the safety and quality of work. At the industry level, the results show that there is no
direct benefit, but most of the interviewees indicated the image of the industry could be improved in the long term.

Multiskilling presents many potential benefits. However, several impediments and limitations to multiskilling implementation do exist. Impediments such as worker resistance and high training cost may affect implementation. Likewise, limitations due to information overload and application area can present problems. However, with adequate measures, such as promotion and provision of subsidized training courses, these impediments and limitations can be overcome.

Concerning about the applicability, the research results show multiskilling is feasible and applicable, but it should be a process of continuous improvement in order to capitalize on previous experience from other countries. The first criterion for implementation is skill proficiency, as it is not possible for workers to expand their skills if their primary trade is not skilled enough. Also, the prevailing economic conditions may favour the implementation as the decreasing number of projects would enable the workers to have more time to attend training courses.

Multiskilling is likely to be the trend of future manpower development in the construction industry, but an industry-wide implementation will require the support of different parties, such as government, training organization, contractors, trade unions and workers. Active co-operation can facilitate a smooth implementation process. The lessons from this study are that some of the factors identified in earlier research are not replicated here. However, as the trend towards globalisation continues, some answers to the competitive challenge may be found through multiskilling. The particular country circumstances differ, so that a contingency approach would be the most appropriate strategy.

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