

PRODUCTIVITY, SKILLS, AND TRAINING: A PROBLEM OF DEFINITION?

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Abstract: There appears to be no agreement on a common framework for defining productivity, skills and training. Accordingly, the relationship between skills and training with respect to productivity remain unclear. This is important to ensure that the industry's skills base and training needs are geared towards improving productivity in the construction industry. This paper seeks to achieve this through an overview of the existing literature to map out the current understanding of productivity, skills and training then attempt to define a domain, where a relationship could be established. The analysis reveals a wide range of definitions that could result in potential confusion in adopting these terms by different stakeholders, which presents an obstacle for collaborative action. As such, this research provides a starting point for investigating this discrepancy and demonstrating that a clear understanding of skills and training is an important step towards inducing productivity gains to the industry.

Keywords: Discrepancy, Productivity, Skills, and Training.

1. INTRODUCTION

The construction industry can be seen as a multi-layered and multi-faceted sector. It is made up of projects, which includes: house building, heavy civil works, repair and maintenance, and refurbishment. The workforce employed on these projects includes: skilled and semi-skilled tradesmen, administrators, managers and professional experts. Governance of the industry is provided by institutes (e.g. CIOB, RICS), training providers and funding bodies (e.g. CITB-ConstructionSkills), industry improvement forums (e.g. Constructing Excellence) and a number of government departments. Clearly, given the sheer number of stakeholders and organisations involved, it is unlikely that a single definition of productivity, skills and training will exist. However, this is required to give guidance to policy aimed at enhancing the skills base of the industry which in turn will influence the performance and productivity of the sector. Without having a precise definition of skills, terms like 'upskilling' becomes somewhat meaningless unless one is clear as to what 'skills' are actually being enhanced (Keep and Mayhew, 1999).

A starting point is to identify the existing definitions and highlight that different understanding has an implication in terms of the actions adopted by different stakeholders. This would help to resolve definitional chaos, which exists between stakeholders, thus providing clearer distinction between different terminologies (Mansfield, 2002). The next step is to define potential links between these concepts and how a common framework of understanding can aid in achieving this goal. Thinking with diagrams (TWD) will be a useful tool used in this paper, where appropriate, to aid in the process of visualising information and easing cognition (Moore, 2002).

2. DEFINING TERMINOLOGIES

2.1 Productivity

A common definition of productivity is output per unit input (Horner and Duff, 2001; Olomolaiye *et al.*, 1998; Oglesby, 1989; Quambar, 1999). However, it is more accurate to describe it as a relationship between output and input which varies in terms of the context and objectives behind measurement (Flanagan *et al.*, 2003). For example, measuring productivity at the operational level will require different sets of input and output as opposed to the firm, project and industry levels. Olomolaiye (1998) considered productivity to be conceptually different than a simple output/input ratio, which should further include the capacity to produce and the effectiveness of the production process. This means that productivity, generally, is an indicator of effective utilisation of inputs to produce maximum output, at the same time, higher productivity levels could be a result of having more inputs, which are not necessarily being used effectively. Indeed, wasteful utilisation of resources could actually be a symptom of poor performance.

This lack of agreement on a single productivity definition leads to confusion in the assessment of the state of productivity at the operational, firm/project, and industry levels respectively. Goodrum *et al.* (2002) described the overall construction productivity at the industry level as declining, whilst the average activity productivity (measured by individual work activities) was increasing over the same time period. Bernstein (2003) argued that this view is flawed as some projects/firms are under-performing and others are performing well. Therefore, the task of defining productivity and capturing it through a single measure is elusive and oversimplifies the performance of a highly fragmented and complex industry.

Koskela (2000) emphasised the importance of promoting a common language or framework to act as a medium or solid base for collaborative action between different stakeholders in the construction industry. In striving for such a definition, Abdel-Wahab and Moore (2005) suggested a three level hierarchical model for productivity; operational, firm/project, and industry-wide. Basically, the model attempts to draw lines of demarcation between different productivity levels and minimises the likelihood of confusion and inherit discrepancy when referring to productivity. It is recognised that there could be various indicators/measures for productivity at each level which are not necessarily consistent. Nevertheless a common domain/framework has been defined for perceiving the same productivity. At the same time, this will provide focus for stakeholders to address each level independently and a common starting point for collaborative action, which is a necessary ingredient if the industry is to remain sustainable and realise its maximum potential.

2.2 Skills

“Despite the enormous interest in how skills in Britain have changed over time, how they are distributed, and how these trends and patterns compare with competing nations, there is surprisingly little agreement on what ‘skills’ actually refer to” (Felstead *et al.*, 2002). Skill is a term variously defined as qualifications, broad skills (Payne 1999) or as part of an overall competency model (Spencer and Spencer 1993)

within construction, it is commonly cited synonymously with trades or crafts, such as bricklaying, plastering (e.g. Clarke and Wall, 1998).

Historically, the term ‘skill’ is used to refer to the manual craft worker and technologist (Ainely, 1993; Keep and Mayhew, 1999). According to the Further Education Unit (1982), “the skill concept was widening to include 'the ability to perform a specific manipulative occupational task' and which now embraces: Language (reading, writing, speaking and listening); number (calculation, measurement, graphs and tables); manipulative dexterity and co-ordination; problem solving; everyday coping, interpersonal relationships; computer literacy and learning”. Payne (1999) considered skills to cover everything from reading, writing reliability, communication, reasoning, problem solving and motivation to assertiveness, judgement, leadership, team working, customer orientation, self-management and continuous learning.

Furthermore, to add to the confusion, skills change with time; some vanish and new skills emerge and this will continue as businesses strive to seek innovations to be more competitive. Felstead *et al.* (2002) ascertain that people coming from different backgrounds perceive skills differently, for example in economics the workforce is regarded as a human capital and investment in skills in the same way as physical capital should yield positive results; whereas in sociology skills are more regarded in the social context as a status.

Notwithstanding the differing emphases in definition, the key question is not whether the quantity and variety of skills acquired by the workforce, but whether they are relevant and effective for a particular job, or not. In other words, it is about the workforce having the right mix of skills at the right time to act as a support for doing their job productively. Johnson (1983) argues that “Skills , formerly understood by many as complex social processes, were now de-contextualised and de-constructed into finite, isolable 'competencies' to be located as the property of the individual, who then carried them, luggage-like, from job to job”. This means that the notion of having more and more skills to guarantee better productivity is flawed, as this ignores the effect of other factors as well as disregarding the job-context for applying these skills.

It is evident that the term ‘skill’ refers to a wide range of disparate definitions, which may result in confusion. So, in an attempt to setting a common framework, Figure (1) is an application of the ‘thinking with diagrams’ concept (mentioned above) to differentiate between skills with respect to job context.

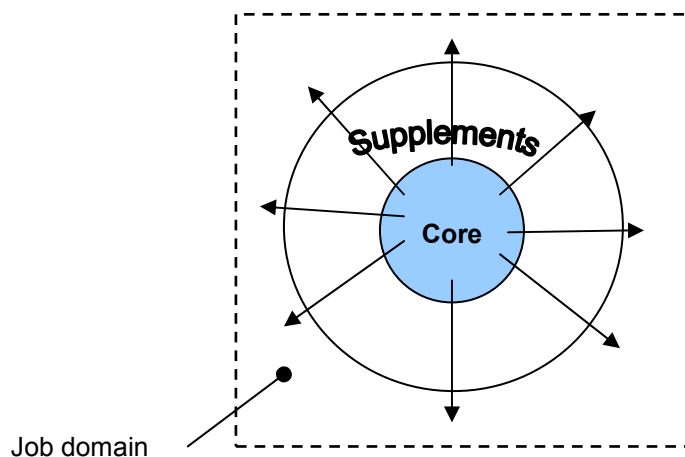


Figure 1: Core and Supplement Skills

This is a schematic diagram which classifies skills into core and supplements. The supplement skills will be acting as vital supporting elements for the core, where the extensions of lines outside the circle demonstrate the importance of the job context in determining these supplements. Therefore, core and supplement skills should be viewed as one mesh which varies across the job domain. Stasz *et al.* (1996) reinforced this view by describing the characteristics of problem solving, teamwork, communication, and disposition (in that case supplements skills) as being related to job demands, which in turn depend on the purpose of the work, the tasks that constitute the job, the organisation of the work, and other aspects of the work context.

At the same time, core skills will be the fundamental skills required for doing the job, for example, a blue collar work core skill would be joinery, whereas skill supplements would include communication and team working skills. The core skills could be easily identifiable as they directly relate to doing the job, but skill supplements are vital for boosting productivity levels. For example, Owens (1987) identified effective managerial communication skills (regarded as a supplement) as an essential part for increasing productivity.

It follows that a holistic view is needed to address both the core and supplement dimensions of skills (see Grugulis, 2003). In most cases, qualifications underpin core skills and are regarded as a proxy for skill. So, this is just an approximation for the type of skills that has to be possessed by the workforce. Yet, the capacity of the existing training infrastructure to respond and cope with the increasing demands and expectations of skills structure at the workplace remains questionable. This stems from the difficulty to incorporate all these skills in one or even multiple qualifications. So, living in a high tech society where the only constant is change, then skill will boil down to the ability of learning to learn (DfEE, 1998).

Then, it will be important in that respect to look at each job independently, though there might be similarities with other jobs, to identify opportunities for productivity improvements. For example, this framework is essential to realise distinctions between sub-sectors in the construction industry, which differs in their job content, thus they require different mixes of skills in terms of core and supplementary skills – in particular.

2.3 Training

The Oxford English Dictionary (2004) defines training as teaching (a person or animal) a particular skill or type of behaviour through regular practice and instruction. Armstrong (1996) mentioned that training usually refers to learning a specific task or job, the skills and behaviours of which are specifically defined, whereas development is an ongoing process involving changing people. This implies that training is a more of a mechanistic process, which is job-centred; meanwhile, development involves educating the workforce, which is person-centred (Fryer, 2004). It is important to note this distinction in order not to use the terms interchangeably resulting in confusion of what is actually meant. It follows that combination of both training and development is essential to attain the required skills to do the job. At the craft level, jobs lean more towards training to perform specific tasks, whereas managerial level positions are more of a development process for changing behaviour. Nevertheless, managers might need training in some instances to use new IT systems or to apply health & safety practices.

Ashworth (2000) recognises this characteristic of training when mentioning that “the emphasis at building craft level is now only training specific, with little attention or attempt paid towards any aspects of education. This provides a level of skill but outside of a framework or context”. He added that “there is a need to revitalise the image through better education and training”. This is an example showing that the same perception of training, with reference to the definition above, is a cornerstone for common understanding and thus supporting collaborative action.

At the same time, there has to be consistency between the meaning of training and its mode of delivery, and not regarding all training as involving lectures and classroom learning. This is important as different modes of training have an implication in terms of productivity. For example, Zwick (2002) mentioned that on-job training and participation at seminars or talks do not have an impact on productivity at the firm level. He added that the highest productivity impact can be obtained by more structural approaches, like formal internal and external training courses. This treats the training function as a mixed basket of managers and workers, without accounting for differences between ‘training’ and ‘development’ needs as described above. It is vital to realise this distinction, as training comprised of seminars and workshops is a more of a development process that should be aimed towards managers, whereas workers will be more interested on practical issues for doing their job on-site.

Therefore, training and development should be viewed as a human resource management tool for inducing productivity and performance gains. As such, the decision to train or develop staff should be aligned with other business processes, for example, ‘Rover Group’ invested heavily in training to be regarded as a learning organisation, which was not enough for maintaining the survival of the business (Keep and Mayhew, 1999).

They concluded that training should not be regarded as the only means for boosting skill levels, and accordingly pay-back on investment may take long time and may only be realised in conjunction with other changes, such as investment in new plant and machinery.

3. KNOWLEDGE BASE AND PRACTICE

The above discussion has suggested a lack of consensus among academics, in addition to an obvious gap between the body of knowledge and practice, and therefore it is important to explore the nature of this gap in order to identify opportunities for collaborative action.

There could be a widening gap between the body of knowledge and practice, which is supported by Hemsley-Brown (2004) view that management research fails to communicate with practitioners and does not reach sufficiently wide audiences. At the same time, actions by decision makers are insufficiently informed by research, and dissemination is viewed as problematic (Hillage *et al.*, 1998). This highlights the blame-game between researchers and practitioners and how the body of knowledge and practice tend to drift away from each other.

On the other hand, there is a need to move towards collaborative working, where both academics and practitioners will be co-operating to ensure their practice goes in-tune with the existing body of knowledge. “Unless practitioners can identify both the distinctions and the connectivity between management concepts, there is a real danger that the natural cynicism of the industry towards things seen either as modish or quasi-intellectual, will predominate and that what we will see is token rather than genuine commitment to cultural change” (McGeorge and Palmer, 2002, p. 226).

The current situation, as further explained by McGeorge and Palmer (2002), is that there is very little case-study material available in the public domain in terms of the application of the existing concepts in construction management. Hopefully, this paper attempts to close this gap by first identifying the existing body of knowledge with regards to the definitions of: productivity, skills, and training. The next step is to consult with practitioners in order to align their views with the existing body of knowledge and thus identifying possible opportunities for collaborative action. It is critical in that respect to deliver management research for the consumption of practitioners, which is at this point, is failing according to Peters and Howard (2001). Therefore, having discussed the definitions of productivity, skills and training; it is now necessary to explore the domain where links between the three concepts could be drawn.

4. PRODUCTIVITY, SKILLS, AND TRAINING

There is a lot of evidence to suggest that training and accordingly better skills, results in improved productivity levels. For example, Naoum and Hackman (1996) found that lack of experience and training among the top three factors reducing construction productivity. Rojas and Aramvareekul (2003) confirmed that improving training programs were among the top factors for improving construction labour productivity. Furthermore, the Institute of Management and Administration (2003) considered both incompetent managers and the lack of qualified trained workforce to be amongst the top five factors affecting a firm’s productivity. At the same time, variations in productivity figures at the industry, firm/project, and operational levels suggests that there is a considerable potential for improvement. Then, it is not clear how exactly influencing skills through training and development could contribute to realising this potential; Campbell (1988) explained that “training and development can influence performance, but the effects are several steps removed from productivity”.

Whilst some studies might have pointed direction to the importance of certain skills, e.g. Dainty *et al.* (2003) identified ‘team building’ and ‘leadership’ amongst the important skills for project managers; it still remains unclear to quantify the productivity gains realised from training and development towards acquiring these skills. Part of the problem is the confusion in terminology when discussing productivity, skills and training (development), as discussed above.

This demonstrates that the impact of skills in relation to different productivity levels (hierarchy) varies from the macro-level down to the micro-level. It is envisaged that the influence of skills materialise at the activity level, where the composition of core and supplement skills become more visible, thus the relevance of training and development

becomes more apparent. Albrigtsen and Førsund (1990) explained that a micro-level analysis of the construction industry is essential to provide an explanation of lower productivity levels at the macro-level. At the macro-level, skill proxies (qualifications) are used, which may not represent the elements of skills required at the micro-level in order to perform the job productively. Given the expanding nature of skills, Keep and Mayhew (1999) refer to the current vocational and educational training (VET) structure as failing to accommodate for these new skills. This could represent a considerable obstacle for productivity as certain skills may be blocked and not attainable by the workforce. In that respect, Ford's (1990) view about 'skill formation', as 'an emerging holistic concept that embraces and integrates formal education, induction, continuous on-the-job learning, recurrent off-the-job learning and personal development', is necessary for identifying opportunities for productivity gains. However, the core of the problem is that improvement in productivity at the macro-level might not be superimposed on the whole construction industry due to its very nature of being highly fragmented.

In fact, there is a divergence of productivity measured at the industry level as opposed to the activity level (Goodrum *et al.*, 2002). Nevertheless, an analysis is required at each level independently to define this link; at the operational level it will be required to correlate time and money invested in training disparately skilled operatives in relation to productivity levels on-site; this analysis will be essential at the firm level to distinguish between companies which invest in training as opposed to the ones who do not; finally it is essential to have a correlation between the pattern of overall industry investments in training and gross productivity levels. This three-tier analysis has to be distinctive as each level is concerned with providing information within certain level of detail to aid the decision making process. For example, at the industry level it is important for governing bodies to see the bigger picture and develop policies in pursuit of a more productive industry. At the same time, there has to be a consideration for this policy at the operational level to ensure sound representation of the workforce needs at large.

The measurement of skills at each level remains a daunting task, but correction indexes could be employed to account for factors, such as, experience, age, and type of qualification. This presents the future plan of this research in order to provide the necessary support for further development and progression in the construction industry particularly when it comes to top-up training in areas like sustainable development (e.g. waste management) or accommodating other innovations, which may include Modern Method of Construction (MMC). The ultimate goal is to ensure sound responsiveness to the demands of the industry at each level, which necessitates the analysis at each level independently in order to develop a possible link between productivity, skills, and training. This research will contribute partially towards the achievement of this goal, but it remains the task of researchers to deliver solutions for the disposal of the industry's best practice.

5. CONCLUSION

There is no doubt that having a consistent terminology is important in terms of understanding and communicating different views within a highly fragmented industry as construction. By the same token, lack of consistency depicts discrepancies between

the body of knowledge and practice. It is important not to take the variations in definitions of these terms at face value, but rather look at the implications or interpretations made and establish whether the actions taken match this understanding.

This paper has mapped the definitions of productivity, skills and training. While the list is certainly not exhaustive, it is used as an illustration for possible discrepancies and confusions when referring to these terms. This relied on consulting the existing literature and therefore, it will be important to research this further through discussions with different industrialists and academics to develop a common understanding. Finally, getting the definitions right is a critical first step for collaborative action between key industry stakeholders. Eventually, establishing a clear and coherent relationship between skills and training with respect to productivity, to inform policy making.

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