

# IDEA CONTRIBUTION IN CONSTRUCTION: IN SEARCH FOR EVIDENCE OF THE INTERFACE BETWEEN IDEA GENERATION AND ITS IMPLEMENTATION

Natalya Sergeeva<sup>1</sup> and Milan Radosavljevic

*School of Construction Management and Engineering, University of Reading, PO Box 219, Reading, RG 6 6A, UK*

To innovate, retain competitiveness, succeed and flourish, construction firms need a constant stream of innovative ideas and suggestions from highly motivated and committed employees. This drive for employee engagement in the innovation process becomes even more apparent in the construction sector with problems of multi-tiered subcontracting and the widespread reliance on self employment. This study investigates idea contribution as a crucial interface between idea generation (i.e. creativity) and its implementation (i.e. innovation). Based on the critical review of construction and mainstream literature on innovation, creativity and employee engagement this study proposes a conceptual framework for employees' perceptions of ideas contribution involved in the processes of converting ideas into new products, processes or services. The framework is derived under the assumption that decisions on whether or not to contribute new ideas for organisational improvement is influenced by personal characteristics (knowledge, perceived radicality of ideas, favouring of ideas, openness to experience, self-confidence and curiosity), group and organisational factors (rewards, managerial support, collaborative team culture, position in the company and in the team) that might well be unique to each organisational unit. The philosophical epistemology adopted in this study is realism that shares positions of positivism and interpretivism where the conceptual framework is based on explanations, understanding, argumentation and is tested using a mixed methods research design (experimental tasks, questionnaires and observations). The preliminary results confirmed the influence of assumed factors on idea contribution where personal characteristics were valued higher than group and organisational factors. Discussion of recommendations for the future research is provided.

Keywords: construction sector, idea contribution, idea generation, idea implementation, realism.

## INTRODUCTION

The construction industry has been subjected to criticism of the way it approaches innovation and inability to meet clients' expectations of quality and price (Kissi *et al.* 2012). The need to innovate has been recognised by researchers as well as the UK

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<sup>1</sup> n.sergeeva@reading.ac.uk

government. For example, recent report by Wolstenholme (2009) has advocated innovative ideas that occur in construction projects through personal incentives and initiatives. Construction is often considered to be behind other sectors in terms of ability to innovate that much of the academic research often argues (Winch 1998, Gann 2000). One of the challenges construction firms face is motivation of individual employees to contribute innovative ideas (Loosemore *et al.* 2003). Although creativity and innovation have been extensively studied over the last fifty years (Hennessey and Amabile 2010), little is understood about ideas contribution as an interface between the two. Some recent studies in mainstream literature on creativity and innovation (Unsworth 2001, Van de Ven *et al.* 2008) as well as construction literature into innovation (Aouad *et al.* 2010, Ozorhon *et al.* 2010) have recognised that before ideas are implemented they need to be first generated, but even more importantly shared with people responsible for their development. In order to investigate idea contribution the influence of contextual as well as personal factors should be taken into consideration. Csikszentmihalyi (1992) and Furnham *et al.* (2009) found a positive correlation between creativity and personal factors like knowledge, intrinsic motivation, curiosity, intelligence, self-confidence and personality types. In addition, Amabile (1996) and Shalley *et al.* (2004) found a positive correlation between creativity and organisational factors like supportive work environment, autonomy and challenging tasks. Innovation scholars have also found positive correlation between all of these factors and innovativeness, adding flexibility, empowerment and leadership styles (Kanter 1983, Quinn 1985). The factors that influence idea contribution process in the context of construction are yet to be explored. In response to this call, using a mixed method research design including experimental tasks, questionnaires and observations, this study seeks to provide insights into factors that influence employee idea contribution. This information allows exploring the nature of idea contribution process, clarifying factors that are perceived to be important by construction employees within their organisations.

The research starts with reviewing literature on innovation, creativity and employee engagement. From this the conceptual framework for employees' perceptions of idea contribution is derived. The adopted philosophical epistemology and methodology of current study are discussed, followed by the discussion of preliminary results and conclusion.

## **IDEAS AND INNOVATIONS IN CONSTRUCTION**

### **Sources of ideas for innovation**

The need to better understand ideas and innovations within the characteristics of construction context has been elucidated by Bresnen and Marshall (2001). It is argued that construction predominantly implements ideas that originate from elsewhere. Utterback (1971), for example, found that 75 percent of ideas used in development of product innovations come from outside the organisation, suppliers, other organisations or customers. Suppliers can be a source of innovation as firms can take advantage through their innovative inputs or an interactive development where they work closely to develop products. Innovations could also come from other organisations through collaboration, development of projects and learning from each other's experience. Similarly, Gann (2000) showed that ideas can originate from R&D activities of suppliers and manufacturers of materials which are then translated into new products. In the study of Von Hippel (1981), on the other hand, it is shown that ideas for most new product innovations come from customers. It could be in a form of forwarding

information about competitors and their new innovations or through their expertise about the final product.

While it is certain that innovations could occur in response to external needs in the construction sector, Harty (2008) and Li and Love (1998) further argues that problem-solving can also lead to innovative solutions, and is primarily based upon employees involved in the process. Companies heavily rely on internal sources - problem solving and developing new innovative ideas by employees within their organisations as also illustrated by Salter and Gann (2003). There is often resistance to idea creation and willingness to innovate from employees at different levels of organisations. Generally, the industry is inclined towards external stimulus, with little attention being paid to internal sources of innovations and the role of employees in the process.

### **Innovation process: From idea generation to its implementation**

According to Rogers (1983) and Van de Ven *et al.* (2008) the innovation process can be considered as three overlapping phases:

1. Ideas generation, i.e. production of a design concept or technical proposal, recognition of needs or problems;
2. Ideas development, i.e. origination of a technical solution or an invention, production and testing into a concrete product, process or service;
3. Ideas implementation, i.e. introduction of the solution into the market, transforming of the tested idea into adoption of users.

Before ideas are implemented they need to be first generated and contributed by employees and then converted into new products, processes or services. Within the construction management arena recent report by Ozorhon *et al.* (2010) provides an interesting insight into the innovative process from the contractor perspective showing their innovativeness to improve existing products, processes and services. Particularly, more than half of the respondents associated their innovativeness with effectiveness of leadership, work environment and collaborations with partners. They found that while they can be regarded as successful at idea generation process, they believe that they are less successful at diffusing generated ideas and converting them into products, processes and services (Ozorhon *et al.* 2010). These lessons are further strengthened by Aouad *et al.* (2010), stating that beneficence of innovation can be achieved through new ideas and conversion them into practical solutions. As they argue, idea generation process is easier than their conversion into practice because the latter requires employee engagement, commitment and advanced skills. These studies as well as mainstream theories of innovation and employee engagement recognise that ideas need to be converted into new products, processes or services and accept the important role of motivated and committed employees. However, further empirical investigations into idea conversion process from the individual employee perspective within the construction context are required (Greasley *et al.* 2004, Hartmann 2006).

### **Creativity in construction**

People represent the most valuable asset especially for labour-intensive industries like construction (Loosemore *et al.* 2003). At the same time people represent the most difficult resource to manage. They have their own individual needs, and their ability to generate and put forward ideas may vary significantly. The construction industry is represented by diverse groups of individuals (e.g. clients, designers, constructors and suppliers), working alone or in teams on projects. Creativity as a behavioural outcome is seen in the work of architects, but is also necessary in a different form, in other

occupations in construction. Engineers also need to be creative in the solutions to architect's visions, quantity surveyors in their cost advice and procurement systems and project managers in their organisational skills (Walker 2011). The industry's project-based nature represents many disparate organisations which manage project objectives and individual organisational objectives. However, these objectives may not be in line with people's personal objectives.

In the construction management literature the desire for creativity has been occasionally noted (Barrett *et al.* 2008, Salter and Gann 2003). The crucial role of motivated individual team members who share experiences and exploit creativity have also been emphasised (Egbu 2004, Eaton *et al.* 2006). A recent study by Love *et al.* (2011) recognises that for fostering innovation, a job requires creativity and alternative thinking to develop new ideas and solve work-related problems as well as personal initiative (i.e. employees' willingness to take responsibility and challenge). However, there is still no empirical evidence on how employees perceive idea development and contribution and the authors call for more research on how individual employees perceive these processes within their organisations.

### **Employee engagement in construction**

Poor performance and slow innovations in the construction sector could be partly explained by the way the industry manages and respects employees who work within it. As a result, a working group was set up by the government in response to the need for improving respect for people. Consequently, the report (RfP 2000) developed some practical ways to achieve industry wide improvement in terms of employment practices based on profits, ability to achieve effective team working, innovation and productivity. The report highlighted the need to explore how employee engagement enhancing strategies could be applied within construction if the performance of the sector is to be improved. From the first sight, the discussion appears to assume that employee engagement strategies should be appropriate for the construction industry. The socio-technical system of the industry arguably provides a suitable environment for employee engagement in the innovation process to benefit from the advantages it offers (Costa *et al.* 2006). Construction companies thus could be better managed by the appropriate use of employee engagement. Although scholars have examined it from the viewpoint of employees, the concept remains a poorly defined construct. The study of Wilson (1989) is perhaps one of the most explicit in recognising, among recommendations for safety improvement within the construction industry, its dependence on the employees' willingness to engage with the issues of accidents prevention techniques and training. Perception, as Wilkins (2011) further explains, may significantly influence individual's willingness to be engaged regardless of whether one is investigating the activity of safety training or idea contribution process.

### **Personal, group and organisational factors that influence creativity and innovation in construction**

Construction innovation is influenced by a number of internal and external contextual factors (Barrett *et al.* 2008, Hartmann 2006). Among external factors are the market, technological, economical, political factors, regulations, clients and manufacturing (Blayse and Manly 2004). Among internal factors that influence innovation are organisational climate, culture, strategy and personal characteristics (Hartmann 2006), championing behaviour from managerial perspective (Dulami *et al.* 2005, Kissi *et al.* 2012) which are considered in detail below.

*Supportive climate and culture*

Supportive climate has been found to foster innovation championing behaviour of project managers (Dulami *et al.* 2005). Supportive organisational climate may include culture, a clear strategic vision of the company, reward for creativity that values ideas and innovations (Park *et al.* 2004). The chance of an idea to transform project requirements into viable solutions was found to be dependent on the external environment (Blayse and Manley 2004, Park *et al.* 2004). Scholars argue that organisational climate for innovation is based on an individual's perceptions of an organisation's expectations and the potential outcome of innovative behaviour.

Organisational culture represents the system of values and beliefs which influence individual employee behaviour and actions. Cultural attributes that are likely to be inductive to innovation include encouragement of employees to create ideas and innovate without a fear of penalty if they are unsuccessful. It also refers to shared perceptions that employees are striving to achieve a better understanding of each other's goals and openness to new ideas as described by Blayse and Manley (2004). However, these studies are focused on the impact of factors on innovation from senior managers' perspective and less on middle, low level management and employees holding other positions (Kissi *et al.* 2012). Furthermore, these studies are primarily focused on the nature and the impact of innovative behaviour and limited attention is given to individual intentions to innovate. It is, therefore, still somewhat unclear how employees perceive contextual and personality-induced factors and what the interdependences between them are. Kissi *et al.* (2012) recognise that innovative behaviour is significantly influenced by organisational climate, resources and autonomy, but acknowledged that:

'Research into personal and contextual characteristics that moderates the effect of the middle managers' innovation supporting behaviours, could provide more insight into factors that enhance the middle managers' innovation supporting behaviours.' (Kissi *et al.* 2012: 25).

*Personal characteristics*

Sexton and Barrett (2003) explored the organisational factors of innovation by conducting case studies and developed a model which consists of business strategy, organisation of work, technology and people variables. Engaged employees involved in the technology transfer process need knowledge, skills and motivation. Common attributes of individual innovativeness and creativity include background experience, personal traits like openness to experience, high level of energy, self-confidence and strong belief, and cognitive abilities like intelligence and knowledge (Walker 2011). Creation of supportive work environment, on the other hand, is necessary to develop the capabilities (Sexton and Barrett 2003). Managers cannot force implementation of innovation, but can encourage employees to be engaged in the innovative process. Clearly further empirical research is required to investigate other personal characteristics in relation to employees' innovativeness within the construction sector.

## **CONCEPTUAL FRAMEWORK FOR EMPLOYEE IDEA CONTRIBUTION IN CONSTRUCTION**

### **Personal, group and organisational factors that influence employee idea contribution**

Overall, employee decision on whether or not to contribute innovative ideas to employer and work colleagues is assumed to be dependent upon perception of

personality characteristics, group and organisational factors. Figure 1 illustrates a proposed conceptual framework for idea contribution as a dynamic interface between idea generation and its implementation.

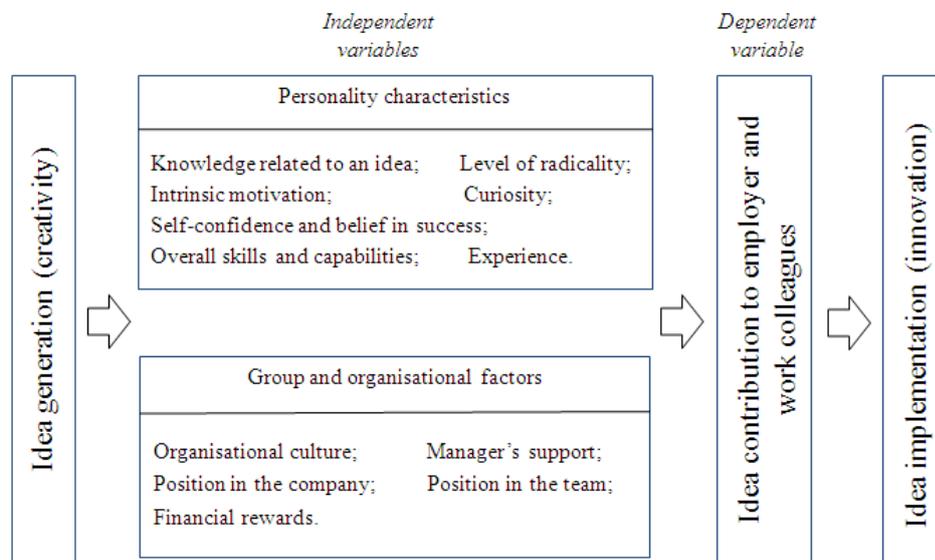


Figure 1: Employee idea contribution as a dynamic interface between idea generation and its implementation including the influence of personal, group and organisational factors

## RESEARCH METHODOLOGY

The purpose of this study is to examine how employees' perceptions of personal, group and organisational factors influence their decisions on whether or not to contribute ideas to employers and work colleagues within their organisations. In order to address the above aim and place idea contribution on the map of innovation-related constructs, the specific objectives from the main path of this study are:

1. Develop a conceptual framework for idea contribution drawing from the literature review on innovation, creativity and employee engagement in the mainstream and the construction management literature;
2. Investigate how personal, group and organisational factors influence idea contribution as perceived by construction and non-construction professionals;
3. Formalise and operationalise a mixed-method approach comprising analytical investigation of a series of experimental tasks, questionnaires and observations.

The overall philosophical epistemology adopted in this study is realism since the interpretation of individual idea contribution phenomena is crucial, and the differences between external and constructed reality have to be identified and understood to explain its relationship with personal factors. One of the most distinctive features of realism is its analysis of causation: explaining why idea contribution exists involves discovering the nature of the phenomenon and investigation of whether employee idea contribution depends on personal, group and organisational factors. Realism shares positivism and interpretivist positions, implying a connection between positive (explanatory/descriptive) and interpretive (concept-dependent/have to be understood) approaches by critiquing and endorsing a relatively wide range of research methods, but suggesting that the particular choices depend on the nature of the subject (Sayer 2000). Realism is applied in current study where conceptual framework is based on explanations, understanding and argumentation and tested empirically by mixed

methods research design including experimental task, series of questionnaires and observations.

As a result of the sampling frame used in this study, 38 employees were drawn from construction industry and 38 employees from a wide variety of industries. On average, the employees were 31.25 years old and had an organisational tenure of 5 years in the UK. Of the construction employees there were office building professionals (32%), housing building professionals (12%) and industrial building professionals (6%). Of the all employees there were senior managers (32%), junior managers (27%) and entry-level employees (41%).

## **PRELIMINARY RESULTS AND DISCUSSION**

The employees were asked to generate change-oriented and improvement ideas about famous building Taipei 101. After the task the employees were asked whether or not they are willing to contribute generated ideas to employer and work colleagues. When the employees were willing to share their ideas, they were finally asked to evaluate to what extent their intentions to contribute ideas depend on personal, group and organisational factors. Table 1 presents mean and standard errors for evaluation of personal, group and organisational factors as drivers for employee idea contribution by a total of 76 employees. On average, personal factors are evaluated as more important than group and organisational ones. In particular, knowledge, intrinsic motivation, skills and capabilities have been valued as more important for idea contribution than level of radicality of an idea, position in the company and financial rewards. This means that employee intention to contribute generated ideas depends to a greater extent on intrinsic, personal characteristics and to a lesser extent on contextual organisational settings. The employee cognitive and psychological characteristics play critical role in the idea contribution process. Organisations can not force employees to share their innovative ideas, but can encourage them to engage in the innovation process by providing a supportive work atmosphere.

Table 1: Mean (M) and standard errors (SE) for personal, group and organisational factors as drivers for idea contribution (based on 1-5 Likert scale: from 1 - least important to 5 - most important)

	M	SE
1 Knowledge	4.18	.10
2 Intrinsic motivation	4.17	.09
3 Skills and capabilities	4.07	.10
4 Curiosity	4.04	.10
5 Self-confidence	4.00	.10
6 Organisational culture	3.84	.11
7 Experience	3.83	.10
8 Manager support	3.57	.13
9 Position in the team	3.38	.12
10 Level of radicality	3.32	.10
11 Position in the company	3.20	.12
12 Financial rewards	3.01	.15

### Some managerial implications

Businesses who wish to adopt innovations should be focused on encouragement of employees to come up and make creative contributions. Since the intrinsic factors are valued higher than group and organisational ones for idea contribution, organisations may pay greater attention to employees' personalities. Table 2 presents some managerial implications derived from the preliminary results.

Table 2: Some managerial implications

Drivers for idea contribution	Managerial actions
Better knowledge and understanding	Possibility for employees to obtain information and learning inside of organisation by special trainings and outside the firm.
Greater intrinsic motivation, enhanced skills, increased confidence	Managers should not reject ideas based on personal judgements or immediately without consideration. They should accept useful and appropriate ideas and reward contributors. Managers should remember that negative experience in the past can lead to lower self-confidence in the future; whereas positive experience can lead to increased confidence in the future.
Organisational culture and managerial support	Organisations should create a supportive climate and culture, a clear strategic vision of the company, reward contributors for valuable innovative ideas.

## CONCLUSIONS

In this paper the mainstream and the construction management literature regarding employee engagement in the innovation process has been reviewed in order to develop a conceptual framework for idea contribution as a mediator between creativity and innovation. Adopting critical realism philosophical position, the study investigates determinants of employee intentions to contribute ideas using mixed-methods research design involving quasi-experiments, questionnaires and observations. The preliminary

results show that, on average, personal characteristics (intrinsic motivation, knowledge and curiosity) are more important than group and organisational factors (position in the company and financial rewards) for idea contribution as perceived by construction and non-construction employees. Construction companies should pay special attention to idea contribution as a critical link between idea generation and its implementation. Greater attention should be paid to the employees, their role and intrinsic characteristics. Better understanding of determinants of employee intentions to contribute innovative ideas is crucial for organisational effective development. Further research may investigate the impact of other personal and contextual factors (e.g. trust, team configurations, empowerment, etc.) on idea contribution using other research methods (e.g. interviews, multiple case studies, longitudinal research, etc.).

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