MAKING AN IMPACT: TEAM BUILDING AS AN ALTERNATIVE EDUCATION TO ENABLE CONSTRUCTION MANAGEMENT HONOURS STUDENTS TO DELIVER

John Smallwood[1] and Chris J Allen

Department of Construction Management, Nelson Mandela University, PO Box 77000, Port Elizabeth, 6031, South Africa

Experience and anecdotal evidence indicate that Honours students experience challenges in terms of completing the academic year. Furthermore, the ten core competencies as well as the fifteen attributes / states of emotional intelligence (EI), impact on students' performance as well as their performance in the work environment post-graduation. The purpose of the study reported on is to determine the impact of a one-day team building event directed at developing the core competencies of students, and enhancing attributes / states relative to the EI of students. A self-administered questionnaire survey of students' perceptions of an event post-intervention provide insight relative to their understanding and appreciation of the intervention, as well as the impact thereof. The salient findings include - the team building activities contributed to: an enhancement of seventeen skills, and an improvement in understanding and appreciation of ten core competencies as well the development thereof; and an enhancement of fifteen attributes / states relative to EI. Based upon the findings it can be concluded that the one-day team building event had the desired impact in terms of the skills desired to be needed to complete the year, thus enhancing the competency of students to perform following graduation.

Keywords: core competencies, emotional intelligence, honours students, team

INTRODUCTION

The Construction Management Honours Programme at Nelson Mandela Metropolitan University (NMMU), South Africa, has since amending its programme to a 1yr post-graduate Honours degree, grappled with students finding it a challenge to complete the academic year. Part of the restructuring of the programme included the removal of an industry year and has resulted in both staff and industry identifying particular issues including:

- An over reliance on technology as the only source of information coupled with an inability to engage with research and discuss the findings of the research conducted;
- An inability to stay the course and complete a set task as instructed;
- A lack of understanding on how to integrate chapters or package information from various sources to form a holistic viewpoint;

[1] john.smallwood@mandela.ac.za

Smallwood, J and Allen, C J (2017) Making An Impact: Team Building As An Alternative Education To Enable Construction Management Honours Students To Deliver *In:* Chan, P W and Neilson, C J (Eds) *Proceeding of the 33rd Annual ARCOM Conference,* 4-6 September 2017, Cambridge, UK, Association of Researchers in Construction Management, 228-237.

- Students have an inability to articulate their thoughts, communicate amongst themselves or with their lecturers / employers;
- They lack site experience and participation in team based activities.

Given the aforementioned, it was decided that a practical intervention needed to be introduced into the Honours programme that could address shortcomings and provide an alternative learning environment within which students where challenged to resolve situations using the combined skill sets and cognitive abilities of their team (class) mates. The mechanism chosen was based on a pre-existing 'Amazing Race' type team building intervention located in close proximity to the university campus, with the expressed intent being to enhance student's competencies thereby improving their ability to complete the year at the first attempt. A study was conducted to determine whether the activities involved in the event contributed to an improvement in participants' understanding and appreciation of ten core competencies; enhanced seventeen skills; developed the ten core competencies, and enhanced fifteen states / attributes relative to emotional intelligence.

THE LITERATURE

Competency and Emotional Intelligence

In Techonomics (2007), H Lee Martin makes reference to the cycle of learning (Figure 1) which is broad concept aligned with acquiring a new skill. Before students attend university they are ignorant with respect to what construction management entails only becoming aware through immersive interventions during their academic years. They are hungry for knowledge but due to a number of structural failures in the current undergraduate programme, they are not sufficiently exposed to the management of resources within defined parameters, along with the requisite technical expertise (Smallwood, 2007) and therefore do not completely master the skill sets required to enter post-graduate study. This leaves them ill equipped when starting the process afresh in the honours year, incompetent with respect to the more onerous requirements of a research treatise and the complexities of balancing the continuous workload associated with it alongside there more traditional theoretical classes.

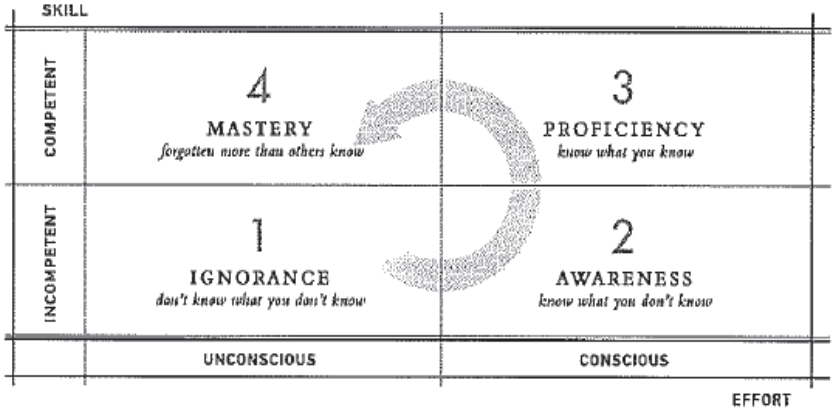

Figure 1: The cycle of learning (Techonomics, 2007)

Competency embodies the capacity to transfer skills and abilities from one area to another 'as competencies are the characteristics of managers that lead to the demonstration of skills and abilities' (Smallwood and Emuze, 2011). An inability to sufficiently master these competencies whilst within the higher education domain through vacation work or practical skills learning leaves the student ill prepared when they do finally graduate. As

Jackson (2015) notes, ‘it is important to be refining, developing and practicing your skills, not simply starting to learn them’. This has been borne out by feedback received through industry liaison bodies, such as the Master Builders Association, whose members have highlighted that students do not come with the competency required of a construction manager and that many lack any affinity to a project environment when commencing employment.

Farrow (2016) also addressed this and highlighted that students are not having “significant learning experiences” because their needs do not match the typical authoritarian, fact-based environment of the traditional college classroom. Furthermore, traditional approaches to management education fail to consider “that practitioners deal with ill-defined, unique, emotive and complex issues” (Cunliffe, 1999) that require a different set of skills to that taught.

Songer and Walker (2004) describe Emotional Intelligence (EI) as an “individual’s ability to identify emotions in oneself and others and to exhibit appropriate responses to environmental stimuli”. Complex projects place additional emphasis on PMs’ needs for EI, because of the unique characteristics such as ‘complexity of personnel, multiplicity of goals, strong uncertainty of activities and difficulty in coordinating stakeholders’ (Fan, 2013) mean there is a ‘strong positive correlation between PM’s EI and project performance’ (Fan, 2013). As the role of the CM within project teams has an even greater influence on the delivery of the project to achieve a positive outcome, these ‘attributes / states of emotional intelligence' all contribute to optimizing (best possible) performance.’ (Smallwood *et al*., 2013)

Sunindijo and Hadikusumo (2005) have also identified that “Project Managers with a higher score of EI tend to use more open communication, a key factor in organizational success’ as ‘emotional self-awareness, self-control, empathy, organizational awareness, cultural understanding and communication’ open the possibility of getting the best out of people. This therefore further emphasises the need ‘to be placed on developing the emotional intelligence of construction managers, commencing during tertiary education’. (Smallwood *et al.*, 2013)

Furthermore, as Smallwood *et al*., noted in Emotional Quotient and Managing Construction Projects (2013), the ten core competencies that fall within the categories of self-concept, traits, and motives, as well as the fifteen attributes / states of emotional intelligence (EI), impact on students’ performance as well as their performance in the work environment post-graduation. Chinowsky and Brown (2004) also pointed out that students with inadequately developed EI will lack problem solving capabilities as well as other professional attributes such as leadership, communication skills, creativity and an understanding of the external variables impacting upon their business.

Smallwood (2007) ‘indicates that supervision, communication, motivation and leadership are the top ranked skills required for practicing construction management’. Competent graduates are in high demand due to an increasing need to deliver services and upgrade infrastructure within the Republic as well as on the rest of the African continent. Therefore, tertiary construction management education programs and training must develop such core competencies (Smallwood and Emuze, 2011) as the employers expect students to hit the ground running when they enter the jobs market.

In addition, the 2008 Confederation of British Industry (CBI) report revealed that board executives (86%) overwhelmingly rank positive attitude and employability skills at the top of their demands. The employability skills include: Self-management - a readiness to

accept responsibility and improve performance, flexibility, and time management; Team working - respecting others, co-operating, persuading, and contributing to discussions, and; Problem solving - analysing facts, issues, and applying creative thinking to develop appropriate solutions.

Alternatives to Traditional Learning Competency

Mo *et al.,* (2007) emphasise that skills include an ability to think across disciplines; team working; and social and environmental awareness. The traditional education model is not providing students with these core skills and learning this in the traditional class room environment is challenging due in part to the gates placed within the structure of university's by administrators so that cross disciplinary, practice based learning only happens infrequently and is mostly coerced. The use of practical workshops is challenged by class size and the limitations of the transport infrastructure, detrimentally impacting the majority of students. "93% of all construction management students surveyed indicated their preference for visual learning while 72% preferred active learning" (Farrow, 2016)

Team based discovery learning is seen as one of the most effective ways in promoting students' learning. (Arifani, 2016) The problem-based learning (PBL) approach involves the learner, reflecting on their experiences, and engaging in self-directed inquiry". (Hmelo-Silver *et al*., 2007) PBL can thus provide a platform within which "students learn content, strategies, and self-directed learning skills through collaboratively solving problems". As project managers usually face problems on projects that 'require them to react to unexpected events and cope with "uncertainty" scenarios' (Zwikael and Gonen, 2007), problem solving, stress tolerance and the ability to forge strong interpersonal relationships to resolve those uncertainty's as quickly as possible become key attributes companies will look for in graduates. These are the very aspects that are lacking in many of the honours cohort and thus teaching 'critical reflexive analysis or the ability to problemize assumptions and generate different perspectives' (Cunliffe, 1999) become core competencies that are observed in a 'field' rather than classroom environment.

This is further supported by the notion that "learning the concepts and theories of a discipline is best situated in the context of the practices of that discipline" and is 'supported by current theories of learning' (Hmelo-Silver *et al.*, 2007). Games may contribute to project management training in organizations and the academy, as they give some practical experience to the participants. (Zwikael and Gonen, 2007) In the context of Higher Education, students have the ability to "transition from visualising and listening and actually attempt to 'do' what they are being taught" (Jackson, 2015) whilst 'team-based discovery learning' is 'very effective' in improving students' ability to 'formulate research topics, develop a draft research proposal, and write a comprehensive research proposal.' (Arifani, 2016)

RESEARCH

The 'Amazing Race' event entailed the completion of six activities, an introductory hoop raising exercise followed by the need for teams to complete a high wire zip line course, negotiate an obstacle course, assemble a puzzle without a reference image, target shooting, and ejecting a plastic ball from a tube filled with water. Each of the activities was led by the resorts' events' team leaders and entailed one or more of the following: strategising; planning; evolving of tactics, and taking of action. Furthermore, completion of the activities required certain skills, whilst core competencies play a role in the completion of such activities, so too the fifteen attributes / states of emotional

intelligence. 19 Students attended the team building event, and were requested to complete a self-administered questionnaire within a few days of the event, with a 100% return experienced, in itself a result based on prior submissions experience. The questionnaire consisted of thirteen questions, twelve of which were closed ended, and either a five-point or six-point Likert scale type question. This papers focus is on the findings relative to four of the questions. A measure of central tendency in the form of a mean score (MS) between 1.00 and 5.00 (five-point), and 0.00 and 5.00 (six-point) was computed based upon the percentage responses to the points on the respective scales to enable interpretation of the responses and to rank variables where necessary.

Table 1 indicates the extent to which the team building activities enhanced seventeen skills in terms of percentage responses to a scale of 1 (minor) to 5 (major), an additional point did not, and MSs.

Table 1: Extent to which the team building activities enhanced participants' skills

Skill	Response (%)							MS	Rank
	U	Did not	Minor ……Major 1	2	3	4	5		
Team building	0.0	0.0	0.0	0.0	0.0	10.5	89.5	4.89	1
Communicating - oral	0.0	0.0	0.0	5.3	0.0	31.6	63.2	4.53	2
Decision making	0.0	0.0	0.0	0.0	10.5	31.6	57.9	4.47	3
Leadership	0.0	0.0	0.0	0.0	0.0	52.6	47.4	4.47	4
Planning	0.0	0.0	0.0	5.3	5.3	26.3	63.2	4.47	5
Motivating	0.0	0.0	0.0	5.3	10.5	21.1	63.2	4.42	6
Coordinating	0.0	0.0	0.0	0.0	5.3	47.4	47.4	4.42	7
Leading	0.0	0.0	0.0	5.3	5.3	36.8	52.6	4.37	8
Organising	0.0	0.0	0.0	5.3	5.3	42.1	47.4	4.32	9
Controlling	0.0	0.0	0.0	0.0	15.8	36.8	47.4	4.32	10
Interpersonal	0.0	0.0	0.0	0.0	10.5	52.6	36.8	4.26	11
Supervisory	0.0	0.0	0.0	5.3	10.5	52.6	31.6	4.11	12
Negotiating	0.0	0.0	0.0	10.5	31.6	15.8	42.1	3.89	13
Initiating	5.3	0.0	0.0	10.5	15.8	26.3	42.1	3.84	14
Procedures development	5.3	0.0	0.0	15.8	5.3	36.8	36.8	3.79	15
Technical	0.0	0.0	0.0	5.6	27.8	50.0	16.7	3.78	16
Persuading	5.3	0.0	5.3	10.5	5.3	52.6	21.1	3.58	17

Given that there are effectively six points on the scale, the MSs are between 0.00 and 5.00, the midpoint being 2.50. It is notable that all the MSs are > 2.50, which indicates that in general the team building activities contributed more of a major than a minor extent to an enhancement in participants' skills.

11 / 15 (64.7%) MSs > 4.17 ≤ 5.00, indicates the extent to which the team building activities enhanced the related skills between a near major extent to a major extent / major extent. Team building, the primary objective of the event, predominates and is ranked first. Communicating orally, the number one operational level construction management skill and major challenge identified amongst the cohort, ranked second, followed by decision making, leadership and planning. It is notable that the five functions of

management work, namely planning, organising, leading, controlling, and coordinating are in the upper range. Table 2 indicates the extent to which the team building activities contributed to an improvement in participants' understanding and appreciation of ten core competencies.

Table 2: Extent to which the team building activities contributed to an improvement in participants' understanding and appreciation of ten core competencies

Core competency	Response (%) U	Did not	Minor 1	2	3	4	Major 5	MS	Rank within	Rank overall
Self-concept:								3.76		
Attitude	0.0	5.3	0.0	0.0	26.3	21.1	47.4	4.00	1	6
Values	0.0	0.0	5.3	0.0	26.3	47.4	21.1	3.79	2	7
Self-image	0.0	0.0	0.0	15.8	26.3	21.1	36.8	3.79	3	9
Aptitude	5.3	0.0	0.0	5.3	31.6	47.4	10.5	3.47	4	10
Traits:								4.19		
Team player	0.0	0.0	0.0	0.0	5.3	31.6	63.2	4.58	1	2
Self-confidence	0.0	0.0	0.0	5.3	10.5	42.1	42.1	4.21	2	4
Handle ambiguity	5.3	0.0	0.0	10.5	5.3	52.6	26.3	3.79	3	8
Motives:								4.42		
Preservation of team integrity	0.0	0.0	0.0	0.0	5.3	26.3	68.4	4.63	1	1
Focus on success	0.0	0.0	0.0	0.0	5.3	42.1	52.6	4.47	2	3
Preservation of personal integrity	0.0	0.0	0.0	5.3	10.5	47.4	36.8	4.16	3	5

Mean MSs based upon the MSs of the three sub-categories of core competencies are also presented. Given that there are effectively six points on the scale, the MSs are between 0.00 and 5.00, the midpoint being 2.50. It is notable that all the MSs are > 2.50, which indicates that in general the team building activities contributed more of a major than a minor extent to an improvement in participants' understanding and appreciation of the ten core competencies. However, a review of the MSs in terms of ranges provides a more detailed perspective.

Two traits, namely team player, and self-confidence, and two motives, namely preservation of team integrity, and focus on success fell within the range of $> 4.17 \leq 5.00$. Preservation of personal integrity (MS = 4.16) is just below the lower end of the range. The other 6 / 10 (60%) MSs are $> 3.34 \leq 4.17$, which indicates the contribution can be deemed to be to a near major contribution / near major contribution: one motive, namely preservation of personal integrity, one trait, namely handle ambiguity, and four self-concept, namely attitude, values, self-image, and aptitude. In terms of categories of core competencies, motives (MS = 4.42) is ranked first followed by traits (MS = 4.19), and self-concept (3.76).

Table 3 indicates the extent to which the team building activities contributed to the development of participants' core competencies in terms of percentage responses to a scale of 1 (minor) to 5 (major), an additional point 'did not', and MSs. Mean MSs based upon the MSs of the three sub-categories of core competencies are also presented. It is notable that all the MSs are > 2.50, which indicates that in general the team building activities contributed more of a major than a minor extent to the development of participants' core competencies.

Table 3: Extent to which the team building activities contributed to the development of participants' core competencies

Core competency	Response (%) U	Did not	Minor 1	2	3	4	Major 5	MS	Rank within	Rank overall
Self-concept:								3.92		
Attitude	0.0	0.0	5.3	0.0	10.5	31.6	52.6	4.26	1	5
Aptitude	0.0	5.3	0.0	0.0	21.1	36.8	36.8	3.95	2	8
Values	5.3	5.3	0.0	0.0	15.8	42.1	31.6	3.74	3	9
Self-image	5.3	5.3	0.0	0.0	26.3	21.1	42.1	3.74	4	10
Traits:								4.19		
Team player	0.0	0.0	0.0	0.0	5.3	42.1	52.6	4.47	1	2
Self-confidence	0.0	0.0	5.3	0.0	10.5	42.1	42.1	4.16	2	6
Handle ambiguity	5.3	0.0	0.0	5.3	10.5	42.1	36.8	3.95	3	7
Motives:								4.45		
Preservation of team integrity	0.0	0.0	0.0	0.0	0.0	36.8	63.2	4.63	1	1
Focus on success	0.0	0.0	0.0	5.3	5.3	26.3	63.2	4.47	2	3
Preservation of personal integrity	0.0	0.0	0.0	0.0	10.5	52.6	36.8	4.26	3	4

6 / 10 (60%) MSs > 4.17 ≤ 5.00, which indicates that the contribution can be deemed to be between a near major extent to a major extent / major extent: one self-concept, namely aptitude; two traits, namely team player, and self-confidence, and all three motives, namely preservation of team integrity, focus on success, and preservation of personal integrity.

The other 4 / 10 (40%) MSs are > 3.34 ≤ 4.17, which indicates the contribution can be deemed to be between a contribution to a near major contribution / near major contribution: three self-concept, namely aptitude, values, and self-image, and one trait, namely handle ambiguity.

In terms of categories of core competencies, motives (MS = 4.45) is ranked first followed by traits (MS = 4.19), and self-concept (3.92). This ranking follows the ranking relative to the extent to which the team building activities contributed to an improvement in participants' understanding and appreciation of the ten core competencies.

Table 4 indicates the extent to which the team building activities enhanced the participants' attributes / states which collectively constitute emotional intelligence in terms of percentage responses to a scale of 1 (minor) to 5 (major), and MSs. It is notable that all the MSs are > 3.00, which indicates that in general the team building activities contributed more of a major than a minor extent to the enhancement of the participants' attributes / states. A review of the MSs provides a more detailed perspective.

4 / 15 (26.7%) MSs > 4.20 ≤ 5.00, indicate that the extent of enhancement is between a near major extent to a major extent / major extent relative to problem solving, happiness, interpersonal relationship, and optimism.

9 / 15 (60%) MSs are > 3.40 ≤ 4.20, indicating that the extent of enhancement is between some extent to a near major extent / near major extent. The attributes / states include: assertiveness; flexibility; social responsibility; impulse control; emotional self-awareness; stress tolerance; reality testing, and independence.

Table 4: Extent to which the team building activities enhanced the participants' attributes / states

Attribute / State	Response (%) U	Minor……Major 1	2	3	4	5	MS	Rank
Problem solving	0.0	0.0	5.3	0.0	31.6	63.2	4.53	1
Happiness	0.0	0.0	0.0	10.5	26.3	63.2	4.53	2
Interpersonal relationship	0.0	0.0	0.0	0.0	52.6	47.4	4.47	3
Optimism	5.3	0.0	0.0	10.5	26.3	57.9	4.26	4
Assertiveness	0.0	0.0	0.0	21.1	42.1	36.8	4.16	5
Flexibility	5.3	0.0	0.0	15.8	26.3	52.6	4.16	6
Social responsibility	5.3	0.0	0.0	21.1	36.8	36.8	3.95	7
Impulse control	5.3	0.0	0.0	26.3	31.6	36.8	3.89	8
Emotional self-awareness	0.0	5.3	5.3	21.1	42.1	26.3	3.79	9
Stress tolerance	10.5	5.3	0.0	21.1	15.8	47.4	3.68	10
Reality testing	10.5	5.3	0.0	21.1	31.6	31.6	3.53	11
Independence	0.0	10.5	5.3	26.3	36.8	21.1	3.53	12
Self-regard	5.6	5.6	0.0	33.3	38.9	16.7	3.44	13
Empathy	5.3	15.8	5.3	10.5	47.4	15.8	3.26	14
Self-actualisation	15.8	0.0	10.5	15.8	42.1	15.8	3.16	15

DISCUSSION

The findings indicate that the team building activities contributed to an improvement in participants' understanding and appreciation of ten core competencies, and enhanced seventeen skills, developed the ten core competencies, and fifteen states / attributes relative to emotional intelligence.

It is notable that relative to the seventeen skills the enhancement was between a near major to major extent / major extent in the case of eleven (64.7%), which included the key skills in the form of team building, oral communicating, decision making, leadership, planning, motivating, coordinating, leading, organising, controlling, and interpersonal. This was an objective of the team building event.

Given that the performance of practitioners and students is affected by the extent to which core competencies manifest themselves, and differentiate between average and above average performance, it is notable that the contribution of the team building event to participants' understanding and appreciation of four (40%) core competencies can be deemed to be between a near major extent to a major extent / major extent, namely team player, and self-confidence, preservation of team integrity, and focus on success. Furthermore, the contribution relative to the remaining six (60%) was between a contribution to a near major contribution / near major contribution. This was an objective of the team building event, especially team player, self-confidence, and focus on success. In terms of the honours year of study the latter two are extremely important.

In terms of the extent to which the team building activities contributed to the development of participants' core competencies, in the case of six the contribution can be deemed to be between a near major extent to a major extent / major extent, namely aptitude, team player, self-confidence, preservation of team integrity, focus on success, and preservation of

personal integrity. This is in alignment with the findings in the literature, especially that of Hmelo-Silver *et al*., and the PBL approach.

In terms of the extent to which the team building activities enhanced the participants' attributes / states, which collectively constitute emotional intelligence, the extent of enhancement in the case of four (26.7%) is between a near major extent to a major extent / major extent relative to problem solving, happiness, interpersonal relationship, and optimism. Then, in the case of nine (60%) it is between some extent to a near major extent / near major extent relative to assertiveness, flexibility, social responsibility, impulse control, emotional self-awareness, stress tolerance, reality testing, and independence.

CONCLUSIONS AND RECOMMENDATIONS

Decision making is an important activity of the leading function. Leadership is important, and complements management. Interpersonal skills are invaluable due to the working with people across all levels in the construction industry. Non-traditional interventions such as the team building event reported on, do impact on honours' students' skills, understanding and appreciation of the core competencies, and their actual core competencies, and attributes / states relative to emotional intelligence, which in turn should have contributed to their ability to successfully complete the honours year of study.

Furthermore, the impact should have contributed to their ability to respond during employment interviews, effectively integrate into the construction industry upon employment, and to fulfil a form of management function in the industry. Given the aim of the team building event, namely to enhance skills, core competencies, and emotional intelligence with a view to contribute to honours students' ability to successfully complete the honours year of study, the team building event can be deemed a success. It has thus been recommended that the team building event be undertaken on an annual basis, and that further potential events directed at enhancing skills, core competencies, and emotional intelligence be investigated.

REFERENCES

Arifani, Y (2016) The implementation of team-based discovery learning to improve students' ability in writing research proposal. *International Education Studies*, **9**(2) 111-119.

Chinowsky, P and Brown, H (2004) The Development of Successful Intelligence in Construction Education. *In*: Khosrowshahi, F (Ed.), Proceedings of the 20th Annual ARCOM Conference, 1-3 September 2004, Edinburgh, UK. Association of Researchers in Construction Management, Vol. 1, 525-32.

Confederation of British Industry (2008) *Taking Stock: CBI Education and Skills Survey* 2008. London: CBI.

Cunliffe, A (1999) Critical Pedagogy: Reflexive dialogical practice in management learning. *The Critical Management Studies (CMS) Conference*. Available from: https://www.mngt.waikato.ac.nz/ejrot/cmsconference/papers_mgmteduc.htm

Fan, L (2013) Improving performance of construction projects. *Engineering, Construction and Architectural Management*, **20**(2), 195-207

Farrow, C.B (2016) Correlating learning styles and student experience in a construction field lab. *Proceedings of the RICS COBRA 2016, Toronto.*

Hmelo-Silver, C, Duncan, R and Chinn, C (2007) Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark. *Educational Psychologist*, **42**(2), 99-107.

Jackson, D (2015) Employability skill development in work-integrated learning: Barriers and best practice. *Studies in Higher Education*, **40**(2), 350-367.

Martin, H L (2007) *Techonomics: The Theory of Industrial Revolution*. New York: CRC Press.

Mo, Y, Dainty, A and Price, A (2007) An assessment of the emotional intelligence of construction students: An empirical investigation. *In*: Boyd, D (Ed.), Proceedings of the 23rd Annual ARCOM Conference, 3-5 September 2007, Belfast, UK. Association of Researchers in Construction Management, Vol. 1, 325-34.

Smallwood, J J and Emuze, F (2011) Core competencies and the practice of construction management: A pilot South African study. *In*: Egbu, C and Lou, E C W (Eds.), *Proceedings of the 27th Annual ARCOM Conference*, 5-7 September 2011, Bristol, UK. Association of Researchers in Construction Management, 383-92.

Smallwood, J J (2007) The practice of construction management. *Acta Structilia*, **13**(2) 62-89

Smallwood, J J, Emuze, F and Bloomberg, C (2013) Emotional quotient and managing construction projects. *New Developments in Structural Engineering and Construction ISEC-7*, June 18 -23, Honolulu, Hawaii.

Songer, A and Walker, B (2004) Central contractor emotional intelligence in the construction industry. *In*: Khosrowshahi, F (Ed.), *Proceedings of the 20th Annual ARCOM Conference*, 1-3 September 2004, Edinburgh, UK. Association of Researchers in Construction Management, Vol. 1, 487-93.

Sunindijo, R and Hadikusumo, B (2005) Benefits of emotional intelligence to project management: A study of leadership and conflict resolution style of project managers in Thailand. *Proceedings of the Queensland University of Technology Research Week*.

Zwikael, O and Gonen, A (2007) Project execution game (PEG): Training towards managing unexpected events. *Journal of European Industrial Training*, **31**(6), 495-512.