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SUPERVISED WORK EXPERIENCE: CONSTRUCTION COMPANIES AS LEARNING ORGANISATIONS

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ABSTRACT: The benefits to students of an industrial placement or supervised work experience (SWE) as an integral part of undergraduate degree programmes have long been accepted. Employers use SWE as an opportunity to assess the capability of students prior to offering them permanent employment on completion of their studies. Likewise, students use SWE to review an employer's ability to provide them with the relevant post graduation experience to enable them to progress to professional qualification. Also, during SWE they assess the construction industry in terms of its working environment and as a long-term career.

The paper presents the finding of a 7-year study into the ability of organisations within the construction industry to provide appropriate learning environments during SWE. The paper concludes that construction organisations are perceived to be supportive in terms of personal and informal support provided by colleagues and to a lesser extent working practices but less supportive in terms of the more formal support given by managers, specifically in the use of appraisal systems. Construction organisations need to accurately assess their ability to provide an effective learning environment in order to attract potential employees to a career in construction and to retain students within the industry after SWE.

Keywords – Construction; learning climate; learning organisations; supervised work experience

INTRODUCTION

The BSc in Commercial Management and Quantity Surveying (CM&QS) is a collaborative degree programme between UMIST and a consortium of the United Kingdom's leading construction companies. It aims to educate students in the fields of commercial management and quantity surveying and to prepare them for work in a contracting organisation. The ethos of the course is that such education is a blend of academic study and industry based training.

The inclusion of the longest possible period of industrial training was a specific requirement of the consortium. The programme, therefore, is of four-years duration and includes a compulsory year in industry as its third year. Described as Supervised Work Experience (SWE), students are required to complete 46 weeks of paid industrial work experience, which can count towards their experience for the RICS Assessment of Professional Competence. The SWE is not formally assessed for progression to the final year of the programme, however, students are required to submit a critical and detailed report on an aspect of their SWE and present the

report to the student group and selected staff as part of their final year assessment. UMIST and the consortium designed the SWE to include a programme of experience and self-development for the student. While academics visit the students during the SWE, the sponsoring organisation is responsible for providing appropriate industrial training and learning environments.

This paper reports on a 7-year investigation into the learning environment experienced by students during SWE. Subsidiary objectives were to investigate:

- Students' perceptions of the learning climate of their organisation;
- Factors that influenced their SWE experience; and
- Changes in these perceptions over time (1996-2002).

BACKGROUND

According to Ashworth and Saxton (1992), the purpose of a work placement year is to:

- Develop maturity,
- Enable the exploration of the theory-practice link,
- Encourage the development of critical but pragmatic thinking, and
- Facilitate systems thinking.

Further benefits to students include the opportunity to:

- Assess the construction industry as long-term career,
- Assess a potential employer in terms of career prospects, working environment, structured training programmes, enabling them to achieve professional status etc. and
- Select a topic for their final year research project within the context of the employing organisation.

A recent report commissioned by the DfES concluded that:

- With guidance, students of all ages can learn from their experiences in the world of work to develop their key competencies and skills and enhance their employability.
- Employers value people who have undertaken work experience, been able to reflect upon that experience and then go on to articulate and apply what they have learnt.
- Partnerships between employers and Higher Education are valuable in promoting work-related learning and in improving the quality and quantity of such experiences (Work Experience Group, DfES, 2002)

The potential benefits for employers of SWE students include:

- Recruiting and training future employees,
- Meeting current labour shortages,

- Expanding a well-prepared labour pool,
- Fostering a positive public image,
- Cultivating business opportunities with universities, and
- Receiving wage subsidies (Jackson and Wirt, 1996).

Construction employers see the inclusion of SWE within degree programmes as essential: it affords them the opportunity to present a wide vision of the potential careers available within the industry (Mann, 2002). Moreover, as a result of the current UK shortage of construction graduates employers accept that their priority is to keep students studying on construction courses in the industry when they qualify. To support this the Construction Industry Council are developing a framework for employers when taking students on work experience (Hampton, 2001).

There are, however, financial implications to be considered by employers providing SWE placements. These include the cost of:

- Planning work-based learning,
- Orienting and training staff,
- Training, supervising, mentoring and evaluating students,
- Student's salaries, and
- Poaching (when other companies hire the best students after training) (Jackson and Wirt, 1996).

Learning within the workplace

Learning naturally occurs in the work environment (Binsted, 1980) in many situations: formal, informal or incidental (Marsick and Watkins, 1990). New experiences or perceptions provide learning opportunities, usually unintended, which may be seized upon or passed over (Rogers, 1986). This natural learning is part of the process of living. In fact most individual development will occur on the job and not through structured learning activities (Mumford, 1987).

The learning environment at work is more than just a physical area, it contains people and resources: ideas, knowledge and know how. Learners, however, often fail to draw upon the richness of opportunities to learning at work (Harri-Augustein and Thomas, 1991). Also, individual learner can be helped or hindered by the organisation in which he or she works, the environment may not be absolutely fundamental but can be a powerful influence (Mumford, 1992).

The learning organisation

Love et al. (2000) provide several definitions of both the learning organisation and organisational learning. However, to summarise a successful learning organisation should: make a commitment to knowledge (Mills and Friesen, 1992); have a learning culture (McGill and Slocum, 1993); appreciating the significance and dynamics of the learning process (Easterby-Smith, 1990); have a mechanism for renewal within itself; possess an openness to the outside world so that it may respond to what is occurring there (Mills and Friesen, 1992); use systematic problem solving (Garvin,

1994; Senge, 1991); promote and continually experiment (Easterby-Smith, 1990; McGill and Slocum, 1993; Garvin, 1994); learn from their own experience and past history; learn from the experience and best practices of others; transfer knowledge quickly and efficiently throughout the organisation (Garvin, 1994); possess accurate information systems; have reward systems that recognise and reinforce learning; have human resource practices that select people for their ability to learn; possess a leader's mandate for unlearning and learning (McGill and Slocum, 1993); and effectively manage and use learning opportunities.

Improving experiential learning at work

Learning organisations benefit from mechanisms that transfer learning from an individual to a group. Further, they must teach employees how to learn and reward them for success in learning (Mills and Friesen, 1992). Work-based learning opportunities are crucially dependent on the way in which work is organised and allocated (Eraut, 1994). While Freedman (1967) states that learners are more influenced by their peers than by any other factor within their learning environment. For example, those factors that hindered learning within organisations were: relations with other people, other people's characteristics, organisational structures, the environment, and job characteristics (Vandenput, 1973).

Learning environments should be both supportive and challenging (Knox, 1986), affording trust, mutual support, acceptance of the individual, warmth and respect. Thereby enabling the learner to take risks, admit to difficulties and problems, give and receive feedback and cope with the allied stresses (Boydell, 1976).

EMPIRICAL FINDINGS

Sample

The sample investigated was students from the BSc in CM&QS programme at UMIST, who had completed at least 46 weeks of SWE with a UK construction company (the majority of whom were sponsored by a consortium member). The sample comprised the years 1996-2002. Table 1 indicates the total number of students in each year and the number of responses for each year. Ultimately, 149 students out of a possible 177 took part, representing a response rate of 84%.

	1996	1997	1998	1999	2000	2001	2002	Total
No. (responses)	18	21	20	20	19	29	22	149
Total in cohort	22	22	24	24	23	36	26	177
% Response	82	95	83	83	83	81	85	84
No. of females	2	5	5	4	8	9	7	40

Table 1. Number of responses, total number of students, % response and number of female students (per year and in total)

Questionnaire

The students were required to complete a learning climate questionnaire (LCQ), an inventory designed to elicit information on whether they considered their work placement organisation provided an appropriate climate. The LCQ required the students to rate fifteen pairs of statements on a five-point semantic differential scale. The chosen statements were derived from Pedler *et al's* (1991) measuring the quality of your learning climate, Honey and Mumford's (1989) work situation items and Mumford's (1980) ways in which supervisors can improve the learning climate. Also, the students were asked to list five positive and five negative aspects of their year in industry. The questionnaires were all completed in week 1 semester 1 of the student's final year of study.

Analysis

Descriptive statistics were calculated for each item of the LCQ. The items were ranked based on the mean score. Each item of the LCQ and the LCQ summary variable was analysed for differences between the total sample and the median score (2) using 't' tests and its comparable non-parametric test. They were further analysed for differences between subgroups based on the year of study (1996-2002) by means of one-way analysis of variance (ANOVA) and its comparable non-parametric test. Further, each item of the LCQ and the LCQ summary variable were correlated with time (Year of study). Finally, the positive and negative factors that influenced the students' SWE were collated and ranked in order of importance.

PERCEPTIONS OF THE LEARNING CLIMATE

Descriptive statistics

The literature review established the influence of the learning environment on learning from experience at work. Frequencies and summary statistics for the fifteen statements used in the LCQ are presented in Table 2, ranked based on their mean scores. Further, the items were tested for differences against the median value (2) see Table 3.

	Five-point semantic differential scale								
	4	**3**	**2**	**1**	**0**		**Median**	**Mean**	**SD**
People manage themselves and their work; there is great emphasis on taking personal responsibility	33	**72**	38	4	2	People conform to rules and standards at all times - no personal responsibility is taken or given	3	2.87	0.83
People are usually ready to give their views and pass on information	36	**68**	27	11	7	People tend to keep their feelings to themselves; are secretive and information is hoarded	3	2.77	1.05
The organisation is an open and friendly place	44	**52**	33	9	11	There is little openness and support; the organisation is cold and insular	3	2.73	1.17

Discussion of problems is actively encouraged	27	**51**	49	19	3	'People don't have problems'	3	2.54	1.00
People are very willing and supportive; pleasure is taken in the success of others	22	**59**	42	18	8	People don't support each other; there is an unwillingness to pool or share information	3	2.46	1.06
People are encouraged to learn at all times and to extend themselves and their knowledge	24	**57**	36	24	8	There is little encouragement to learn; there are low expectations of people in terms of new skills and abilities	3	2.44	1.10
High standards are a goal to be achieved	23	47	**52**	22	5	High standards are compulsory	2	2.41	1.03
Explicitly deals with risk and uncertainty	15	43	**67**	15	9	Avoids risk and uncertainty	2	2.27	0.98
There are lots of resources; development facilities are very good	20	**46**	42	30	11	Training packages, resources and equipment are limited	2	2.23	1.14
Working practices and structures are constantly under review	26	37	**41**	33	12	Working practices and structures are static	2	2.21	1.21
Accepts that some forecasts will prove to be inadequate	3	39	**81**	19	6	Does not accept inadequate forecasts	2	2.09	0.79
Constructive feedback is often provided about your performance	18	38	**41**	**41**	11	Constructive feedback is rarely provided about your performance	2	2.07	1.15
People are recognised for good work and rewarded for effort and learning	10	42	**56**	28	13	People's successes are ignored but blame is readily attributed	2	2.05	1.04
If people develop a new skill or technique there is plenty of opportunity to use it	7	46	**55**	29	12	If people develop a new skill or technique there are few opportunities to use it	2	2.05	1.01
There is a systematic process for identifying individual development needs	12	31	**44**	39	23	The identification of development needs is left to the individual	2	1.80	1.17

Bold = Mode

Table 2. Frequencies, means and standard deviations of individual items of the Learning Climate Questionnaire (LCQ) [n = 149]

The 15 variables can be summarized under three headings: ‘Human Support’ (HS), ‘Working Practices’ (WP) and ‘Staff Development Systems’ (SDS). The validity of these dimensions is supported by Vandenput (1973) who found the most significant factors that aided learning within an organisation to be: relations with other people, degree of autonomy and policies, and commitment towards training and learning. Also, factor analysis of the LCQ items supports these three dimensions (Lowe, 1996).

Those statements given a high rating: "People manage themselves and their work; there is great emphasis on taking personal responsibility" (HS); "People are usually ready to give their views and pass on information" (HS); "The organisation is an

open and friendly place" (HS); “Discussion of problems is actively encouraged” (HS); “People are very willing and supportive; pleasure is taken in the success of others” (HS); “People are encouraged to learn at all times and to extend themselves and their knowledge” (SDS); "High standards are a goal to be achieved" (WP) and “Explicitly deals with risk and uncertainty” (WP). The t-test for independent samples also revealed a very highly significant difference at the 0.1% level in these items when tested against the median value.

Item		Median (2)		Year of study	
		T	Z	F	x^2
Personal Responsibility	HS	12.793***	-8.517***	0.848	4.833
People – Information	HS	8.998***	-6.930***	1.065	7.909
Organisation	HS	7.657***	-6.074***	1.814	10.568
Problems	HS	6.575***	-5.749***	2.290*	14.751*
Support	HS	5.353***	-4.733***	2.588*	15.032*
Encouragement to learn	SDS	4.820***	-4.390***	2.335*	16.162*
High Standards	WP	4.867***	-4.496***	1.766	9.635
Risk and Uncertainty	WP	3.331***	-3.031**	1.573	10.639
Resources	SDS	2.444*	-2.358*	1.612	10.510
Working Practices	WP	2.174*	-2.226*	3.116**	18.251**
Forecasts	WP	1.449	-1.366	0.379	2.277
Feedback	HS	0.787	-0.870	4.770***	24.487***
Recognition of Work	HS	0.627	-0.509	1.825	10.884
New Skills	HS	0.568	-0.446	1.250	8.003
Identification of Needs	SDS	-2.094*	-2.089*	2.682*	15.321*
Average of all variables		6.499***	-6.004***	3.335**	20.798**

*** = p≤ 0.001 ** = p≤ 0.01 *= p≤ 0.05; 't' = t-test for Independent Samples, 'z' = Mann-Whitney U – Wilcoxon Rank Sum W Test, F = F Ratio Oneway Analysis of Variance, x^2 = Chi-Square Kurskal-Wallis 1-Way ANOVA; HS = Human Support, SDS = Staff Development Systems; WP = Working Practices

Table 3. ANOVA and tests for differences in the Learning Climate Questionnaire items (n = 149)

The results indicate that the working environment within construction organisations is perceived by the students to be supportive in terms of human support and to a lesser extent in working practices. However, the human support items appear to be related to the personal and informal support from colleagues. This finding is important as learning within an environment requires a human communications network or society (Rogers, 1986), relates to the social context within which learning takes place (Lovell, 1980), while Snell (1992) considers the main source of 'pain' in

learning to be the prevailing organisational ethos of competitive individualism. Further, Freedman (1967) states that learners are more influenced by their peers than by any other factor within their learning environment.

Those items that were not significantly different from the median value were: “Accepts that some forecasts will prove to be inadequate” (WP); “Constructive feedback is often provided about your performance” (HS); “People are recognised for good work and rewarded for effort and learning” (HS); and “If people develop a new skill or technique there is plenty of opportunity to use it” (HS). Further, the statement "There is a systematic process for identifying individual development needs" was given a low rating, significantly below the median value (5% level).

These results suggested that the working environment was considered to be less supportive in terms of the more formal support given by managers within the organisation and specifically in terms of the use of appraisal systems to identify development needs. This supports the findings of Scott and Harris (1998) who discovered that the majority of in place project feedback systems were informal and unstructured, which prohibited effective learning from taking place.

Differences in the students' perceptions of the learning climate of their organisation based on the year of study

The items of the LCQ and its summary variable were tested for differences between subgroups based on the students’ year of study (See table 1 for sizes of subgroups). The results are presented in Table 3.

ANOVA revealed a very highly significant difference at the 0.1% level in the item: “Constructive feedback is often provided about your performance” (HS); a highly significant difference at the 1% level in the item: “Working practices and structures are constantly under review” (WP) and the average of all the LCQ variables; and a significant difference at the 5% level in the following: “People are encouraged to learn at all times and to extend themselves and their knowledge” (SDS), “There is a systematic process for identifying individual development needs” (SDS), “People are very willing and supportive; pleasure is taken in the success of others” (HS) and “Discussion of problems is actively encouraged” (HS).

Closer examination using Bonferroni’s multiple comparison test revealed that for the following items:

- “There is a systematic process for identifying individual development needs” and “People are very willing and supportive; pleasure is taken in the success of others”: there were no significant differences between subgroups at the 5% level.
- “Discussion of problems is actively encouraged”; “People are encouraged to learn at all times and to extend themselves and their knowledge”; and the average of all the LCQ variables: the mean score for the 1996 student group was significantly lower than that of the 1998 group (at the 5% level).

- “Working practices and structures are constantly under review”: the mean score for the 1996 student group was significantly lower than those of the 1997, 1998 and 2002 groups (at the 5% level).
- “Constructive feedback is often provided about your performance”: the score for the 1996 student group was significantly lower than those of the 2001 and 2002 groups, also the score for the 1999 student group was significantly lower than that of the 2001 group (all at the 5% level).

The findings indicate homogeneity in the students’ responses to 11 out of the 15 LCQ items. Further, those items identified by ANOVA as being significant, with the exception of “Constructive feedback is often provided about your performance” and possibly “Working practices and structures are constantly under review”, appear to reflect the dissatisfaction of the 1996 group. However, the results for these two items may reflect trends indicating an improvement in these items over time.

Relationships between the learning climate and time

To investigate this further the items of the LCQ questionnaire were correlated with time (1996-2002). Pearson's 's' (P’s’) and Spearman's 'rho' (S’r’) correlation coefficients were calculated and indicate that the following correlate significantly and positively with time:

- “Constructive feedback is often provided about your performance” (HS): at the 1% level (P’s’ = 0.271; S’r’ = 0.269);
- “There are lots of resources; development facilities are very good” (SDS): at the 5% level (P’s’ = 0.198; S’r’ = 0.200);
- “There is a systematic process for identifying individual development needs” (SDS): at the 5% level (P’s’ = 0.165; S’r’ = 0.171);
- “People are very willing and supportive; pleasure is taken in the success of others” (HS): at the 5% level (P’s’ = 0.161).

To remove the effect of the 1996 student group Pearson's 's' (P’s’) and Spearman's 'rho' (S’r’) correlation coefficients were calculated for the years 1997-2002 and revealed that only the following item correlated significantly and positively with time:

- “Constructive feedback is often provided about your performance” (HS): at the 5% level (P’s’ = 0.187; S’r’ = 0.191).

The results indicate that the students' scores for the item related to the provision of feedback has increased significantly over time. However, for the items relating to the provision of resources, support and identifying development needs, again, the results would appear to indicate that the 1996 group were particularly dissatisfied with these items rather than demonstrate an improvement trend over time.

Positive and negative SWE factors

Table 4 presents positive and negative factors that influenced the students’ SWE ranked in order of importance for two representative student groups 1998 and 2002.

The responses of the two student groups are very similar. For example, level of responsibility, experience and variety of work and a friendly atmosphere were consistent positive factors. Likewise, lots of travel, long hours poor training and poor supervision were consistent negative factors. It is interesting to note that for the first time in 2002 the students perceived the salary they received to be a positive influence rather than a negative factor as indicated in 1998. Disturbing, however, is that students considered their tasks to be boring or less glamorous and that several comments were made regarding sexism encountered within construction organisations.

	Positive factors		
	1998		**2002**
1	Level of responsibility	1	Level of responsibility
2	Experience of work	2	Variety of work
3	Friendly atmosphere	3	Experience of work
4	Working relationships	4	Friendly atmosphere
5	Training opportunities	5	Good/regular salary
6	Variety of work	6	Working in teams
7	Social life	7	Link between studies and work
8	Involvement in prestigious project	8	People pass on information
9	Dealing with people	9	Training opportunities
		10	Working relationships
	Negative factors		
	1998		**2002**
1	Lots of travel/being away from home	1	Long hours
2	Poor site management	2	Boring/less glamorous tasks
3	Lack of money	3	Lots of travel
4	Long hours	4	Poor supervision
5	Poor training	5	Poor training
6	Poor supervision	6	Lack of cooperation/trust
7	Lack of variety of work	7	Weather conditions/working on site
8	Lack of understanding of your ability	8	Sexism
9	Supervisors ill prepared	9	Being the student
10	Poor working conditions	10	Uncertainty/lack of choice of job location

Table 4. Factors influencing the students' perception of supervised work experience

CONCLUSIONS

The following conclusions have been drawn from the investigation.

The learning climate within construction organisations (working environment)

- The working environment is perceived to be supportive in terms of human support and to a lesser extent working practices. These human support items appear to be related to the personal and informal support from colleagues.
- It is considered to be less supportive in terms of the more formal support given by managers within the organisation and specifically in terms of the use of appraisal systems.

- There is a high degree of homogeneity in the responses of the students to the items of the LCQ questionnaire.
- There has been a significant improvement over time in the students' perception of the provision of feedback on individual performance within construction organisations, however this item is still ranked 12th out of 15 LCQ items.

Construction organisations should consider either introducing, or applying more effectively, formal appraisal systems, as a mechanism for identifying individual development needs. Likewise, they should critically examine how managers of SWE students provide formal support. For example, they should consider introducing effective feedback mechanisms that require both the individual to critically reflect on their own performance and the organisation to provide effective constructive feedback on an individual's performance.

Factors influencing the supervised work experience

- Level of responsibility, experience and variety of work, and a friendly atmosphere were consistently considered to be positive factors.
- Lots of travel, long hours, poor training and poor supervision were consistently considered to be negative factors.
- For the first time in 2002 the students perceived the salary they received to be a positive influence rather than a negative one as indicated in 1998.
- Current negative influences were: students considered their tasks to be boring or less glamorous, and the sexism encountered within construction organisations.

The implication of these findings is that construction companies need to accurately assess their ability to provide an effective learning environment and to address any deficiencies. This would appear crucial if they are to attract potential employees to a career in construction and to retain students within the industry after SWE.

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