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CARE OF THE SELF: EMBEDDING WELL-BEING IN ARCHITECTURAL EDUCATION

Peter Holgate [1]; Paul Jones [2] etc
[1]Programme Leader, Master of Architecture, Northumbria University,
peter.holgate@northumbria.ac.uk
[2]Director of Architecture Programmes, Northumbria University,
p.jones@northumbria.ac.uk

ABSTRACT

In this paper we consider the impact of conflicting work, study and social pressures on architecture students in the particular context of Northumbria University. We will also consider students' abilities to manage their time effectively, and whether architecture as a profession has a duty of care to students and practitioners to establish healthy working methods. We will also report on a small scale research initiative to examine student time management in more depth.

Keywords
Architecture, higher education, time management, well-being.

INTRODUCTION

London, 1988: An architecture student sets her alarm for a maximum of two hours of sleep in the afternoon after working all night to complete a student project. Her mother prepares a meal as quietly as possible, in order not to wake her daughter, and feels powerless to help.

Frankfurt 1996: One of the authors is preparing to work all night in order to complete the drawings for an office development, ahead of a planning submission scheduled for the following day; his wife is at home, exhausted with a two year old baby. One of the office partners, about to leave for the evening enquires about the project's progress. When told of the expectation to work overnight, the partner orders the author to go home; 'we don't work overnight in this bureau' he states categorically. Work on the submission is completed successfully the following day, achieving the deadline.

Newcastle 2009: One of our students states that she expects to be working on her design project overnight; we tell her to do her best, but no more; she has to sleep; her health is more important than architecture.

Background

It is a truism that there is never enough time in architecture. The profession is populated by practitioners and students who care about their work to the point of obsession. There will always be another construction detail to be drawn to ensure that the architect's vision is faithfully reproduced; there is always another development of the proposals which could improve the design immeasurably; there is always another rendering which will communicate the design more effectively. In short, there is often a drive towards an unattainable perfectionism in a creative profession which sees architects continually setting themselves exemplary standards through impossible targets. This has been compounded in recent decades by the impact of various technological and cultural shifts. The rise of Computer Aided Architectural Design (CAAD) has fundamentally increased the notional productivity of architects and designers; additionally, the internet has allowed unhindered access to a constant stream of information, thereby breaking 'traditional', bounded working and living patterns.

This 'perfectionist' behaviour of architects is exacerbated and encouraged by both intrinsic and extrinsic influences. The professional education and development of the architect (which is held by its own community of practice and by external educationalists in high esteem) has to some degree become entrapped by its own

signature pedagogy (Schulman, 2005; Boyer & Mitgang, 1996; Schon, 1994). Problem-based learning is justly praised as a teaching approach which develops functioning knowledge in response to complex and authentic tasks. However, its limitations have been less conspicuously reported. Extrinsically, the introduction of, and subsequent rise in higher education fees has added to existing time pressures, with students having to seek paid employment to cover tuition and maintenance fees. With the raising of the Universities' fee cap in England in 2011, these pressures are likely to continue and rise.

This paper seeks to confine its inquiry to architectural education, in the specific context of Northumbria University. The development of a studio culture has been central to the problem-based pedagogy adopted here, with the aim of encouraging peer learning and self-assessment, and establishing learning communities of practice (Wenger, 2003). Studio hours have been deliberately restricted in the hope that students adopt sensible and healthy working patterns. By comparison, it should be noted that the University library has recently commenced 24 hours opening, in response to students' requests for more flexible access. This, reportedly, is a product of students having to work flexible hours to support their finances.

Policy

The Working Time Directive (EC, 2003) explicitly focuses its policy upon the health and safety of the worker. However, the definition of the 'worker' appears to be vaguely defined with regards to the legal positions of students or programmes of study periods. Although a maximum working week of 48 hours is stipulated, derogations are allowed subject to the duties of the employee (e.g. healthcare and emergency workers). The Working Time Directive is currently being reviewed in light of changing workplace trends, and one statistic quoted reports a reduction in the average weekly working hours across the European Union from 39 hours in 1990 to 37.8 hours in 2006 (EC,2010). This document also notes that the 48 hour working week dates back to the Hours of Work (Industry) Convention issued in 1919, and that average working hours for some workers may still vary from 49 to 80 hours per week, particularly where employees are holding down two or more jobs. It can be surmised that similar working hours could apply to students who assume both study and work commitments.

Northumbria University's Duty of Care policies (Northumbria University, 2010) are similarly focused upon student health and well-being. The Working Time Directive is explicitly noted in this document, but only with respect to student placement guidelines; there appears to be no reference to this policy with regards to full-time study workloads, etc. As with other universities which have adopted a modular curriculum, Northumbria University stipulates that a full time student must achieve 120 credit points per academic year. This roughly equates to 1200 study hours in the two-semester academic year, or approximately 40 study hours per week (divided into notional hours of directed learning, independent learning, etc.) In recent years, part-time routes into study have been developed at Northumbria, as per most UK universities. These programmes of study are primarily directed towards students working in professions that align with their studies.

Both regulatory bodies for architecture in the U.K. publish professional guidelines for architectural practice. The Architects Registration Board (ARB) 'Architects Code' states that practitioners should be 'competent to carry out the professional work you undertake to do' (ARB, 2010), and the Royal Institute of British Architects (RIBA) 'Code of Professional Conduct' similarly requires that 'Members should realistically appraise their ability to undertake and achieve any proposed work' (RIBA, 2005). Otherwise, there appears to be nothing explicitly stated in either code regarding the welfare of the architect as either employer or employee.

LITERATURE REVIEW:

A focused review of peer-reviewed literature was undertaken to evaluate existing research which would encompass the subjects of architectural education, time management, sleep deprivation, and associated themes. Search terms needed to be broadened to generate a reasonable spread of literature indicating that there was a gap in the knowledge for this association of issues.

On widening the search terms (and including sources that were not journal based) key texts emerged encompassing the chief concerns of this project. Most forcefully, the American Institute of Architecture Students Report identifies the corrosive effect of long hours on student health (AIAS, 2002). De Graft-Johnson, Manley and Greed (2003) note the impact of architecture's culture of long hours as an influence on the disproportionately small number of women who remain in the profession. Studies of the time management of architectural students proved more difficult to uncover, however, a key text emerged in 'Student Perceptions of Academic Workload in Architectural Education' (Bachman & Bachman, 2006). This quantitative study highlighted the negative impact of studio design projects on student workloads, adopting a notional weekly plan of a 14 credit hour semester as the basis of its methodology. This paper provided the basis for an initial discussion with the study sample group at Northumbria. Bachman & Bachmans' weekly plan underpinned our notional grid for a Northumbria University student's 120 credit point academic year (Table 1). This table breaks the week into the general components of; study; work; sleep; eat; personal; household; commute. These components were then interrogated in further depth in both this paper's literature review and in the students' questionnaire.

Study: Of concern here is the impact of extended hours of study to quality and production. 'Study' with respect to students of architecture, encompasses both declarative knowledge (generally through taught modules, such as history, technology etc.) and functional knowledge (fusing physical activities such as model making, drafting, sketching etc. to creative applications and reflection). At the heart of problem based learning through design projects, this functioning knowledge mirrors authentic practice, yet may also exact more physical and mental demands of the student than traditional 'chalk and talk' activities. Within creative subjects such as architecture, there are also reported benefits of 'downtime' with respect to creativity 'There is direct evidence that creativity is associated with a state of low-focus neural activity.' (Claxton, 2008:148)

Sleep: Sleep research is an enormous field of medical and behavioural research. Sleep deprivation was considered at the outset of this inquiry to be the area of highest importance with respect to the time-management of students. This follows the sobering report of an architecture student being killed in a motoring accident after falling asleep while driving, having spent over 48 hours awake in order to complete a project (AIAS, 2002). The scope and timescale of this inquiry did not extend to an in-depth, comprehensive systematic review of the wealth of literature on general sleep and health research. However, several papers indicated the complexity and impact of sleep-deprivation on student health and performance; it has been reported that sleep-deprived students tend towards low-effort, simpler tasks than comparable, non-sleep deprived colleagues. This behaviour appears to occur in order that some control of quality of response would be maintained, to counter the fatigue and slow reaction times of sleep-deprived students (Engle-Friedman et al., 2003). Correlations of sleep deprivation with depression and mental illnesses have also been reported (Stein et al., 2008). Sleep duration has also been linked with mortality (Grandner et al., 2009), and other studies have linked sleep behaviour with obesity (Patel, 2009), and diabetes (Barone & Menna-Barreto, 2011). In contrast (and of relevance to architecture and design), recent research has established positive correlations between good sleep patterns (particularly with respect to REM sleep) and creativity (Cai et al, 2009). It is to be hoped that knowledge of such studies can persuade students to adopt better sleeping strategies.

Work: Long hours at work, as aforementioned, are seen by policy makers as being detrimental to employee health. For example, a recent study asserts that workers spending more than 11 hours at work could increase their chances of suffering heart attacks by two-thirds (Kivimaki et al., 2011). The optimum balance of work with part-time University study, is also contested, with one study highlighting that part-time students associated time spent in work as positive, yet time spent in University as negative (Lingard, 2007) .

Nutrition: Extensive research has highlighted the importance of nutrition in learning and behaviour (e.g. Dani et al., 2005). Conceivably, excessive time devoted to studio design work could give rise to poor nutrition, however these are issues beyond this inquiry. Similarly, this inquiry does not concern itself with the reported use of cognitive enhancing drugs (e.g. Ritalin) by healthy students hoping to boost academic performances (Greely et al., 2008.)

Personal: Policy commitments to widening access in the architectural profession must also consider the variety of personal factors which can impact upon the time management of students. These may include; students' mental

and physical health, including physical and hidden disabilities; family and religious commitments. Again, the scope of this inquiry is too narrow to encompass all such issues, however, the qualitative responses would hopefully prove useful in indicating a typical range of the personal issues.

Household: This study expected little or no particular aspects of housekeeping (laundry, washing-up, cleaning, etc.) to have significant bearing on student time-management.

Commute: As previously commented, the increase in tuition fees in recent years has led to significant shifts in student lifestyles. Students are choosing to study in local universities and, by extension, remain at the parental home for chiefly financial reasons. Hence, the option of living in halls of residence or student flats close to campus may no longer be open to all. Coupled with a rise in rents over the last twenty years, living at home is set to become more prevalent. Commuting from off-campus may consequently add to a further time pressure on students.

RESEARCH METHODOLOGY

Aims and Objectives

The chief research aim of this inquiry was to generate initial data with respect to student working methods and time management.

The research objectives were to:

a) collect comparative data of the hours allocations for the sample students' weeks

b) gather qualitative data of student's personal experiences with respect to the pressures on their time

Context and Sampling

As a small scale pilot project it was decided to concentrate on the cohort of the first year of the Master of Architecture programme at Northumbria University. This cohort was chosen for this research proposal on the basis that;

a)   they had completed a three year undergraduate programme in architecture, either at Northumbria or elsewhere; they had therefore experienced similar time pressures in the completion of design projects in their first degree

b)   the majority of the students had also completed up to one year's practical experience in architectural practices in the UK, gaining practical experience of the 'typical' working week.

c)   this cohort were concurrently working on a design project which required them to reflect on their design processes and working methods as part of the summative assessment. As such, they were encouraged to consider their time management and provide a written reflection within a design report.

Given the pressures on the second year students of the Masters programme with respect to completing studies in the award year, it was decided to restrict the sample to first year students. The total cohort available was therefore 29 students, clearly limiting the validity of the research for wider application. However, it could be argued that the unique context of Northumbria University (with respect to learning and teaching strategies, project choices, and studio practice) would not necessarily make this research applicable to the wide and varied approaches taken by the many architectural schools throughout the UK and elsewhere. As a focused, contextual inquiry, it could also be argued that this specificity is directly required to improve on localised practice. The sample group were introduced to the research project by way of a short presentation from one of the authors. A straw poll at the time of this presentation indicated that 27 out of the 29 students available had, at some point in their studies, worked through the night to complete design assignments. The author presented the design project brief in order to re-iterate the requirement for the production of individual reflective reports on working methods

and time-management. These reflections could inform participants' responses to data collection. Participation in the enquiry however was clearly presented as being voluntary (see ethics.)

Quantitative Methods

Bachman and Bachman's idealised weekly plan for the 14 credit hour semester provided the basis for an initial discussion with the study sample group. This was adapted by the authors to form a notional student workload plan for the Northumbria University 120 credit point academic year (table 1):

	MON	TUE	WED	THU	FRI	SAT	SUN	Hours
study	8.0	8.0	8.0	8.0	8.0	0.0	0.0	**40**
work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0**
sleep	7.0	7.0	7.0	7.0	7.0	7.0	7.0	**49**
eat	2.0	2.0	2.0	2.0	2.0	2.0	2.0	**14**
personal	5.0	5.0	5.0	5.0	5.0	12.0	12.0	**49**
household	1.0	1.0	1.0	1.0	1.0	2.0	2.0	**9**
commute	1.0	1.0	1.0	1.0	1.0	1.0	1.0	**7**
total	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**168**

Table 1: Notional weekly breakdown for students' academic week

Students were asked to complete a blank grid, estimating the breakdown of their daily and weekly hours for two specified weeks of the academic calendar. The first week (week commencing 14th February 2011) was chosen as being relatively 'normal', having no assignments scheduled for submission. The second week (week commencing 28th March 2011) preceded a major assignment submission for the final review of a studio design project. As Bachman & Bachman (2006) had previously identified studio design projects as being particularly problematic with respect to the time planning of architectural students, these periods were chosen to evaluate weeks of low and high potential stress for the students.

Qualitative Methods

Northumbria University has been praised for its application of constructively aligned problem-based learning in its programmes of architecture, and teaching staff members are keen to maintain this strategy. Continual dialogue between staff and students helps to establish a supportive learning community, and the student voice is respected by staff members. A collaborative research inquiry was therefore developed, with the aspiration of improving student time-management and well-being without an equivalent loss of design quality. The students' voices and personal experiences were therefore considered to be of primary importance in consideration of strategies to improve practice at Northumbria. The components of the idealised weekly plan formed the basis of a semi-structured questionnaire, designed to elicit qualitative responses with respect to the key themes identified on the grids (i.e. study; work; sleep; eat; personal; household; commute). Responses were then compared to find emergent themes (Corbin & Strauss, 2008) common to the participants. The questionnaire was structured to elicit qualitative responses by means of open questions regarding the students' weekly schedules.

Ethics

The inquiry was subject to the ethics guidelines of the School of the Built and Natural Environment at Northumbria University. Students were advised (both verbally and in writing) that participation was voluntary, and that non-participation would not affect either student marks, or staff relationships with students. Informed consent forms were provided for participants explaining that data from completed grids and the questionnaires could be used anonymously in publications. It was clarified by the authors that data collected would be stored in a locked, secure location, unavailable to public access and scheduled to be destroyed within three years. On completion of the grids, students were asked to return these to the School's administration office for collation before being returned to the authors. Questionnaires respected the students' anonymity, and no details of gender, age, location etc. were requested from participants.

RESEARCH FINDINGS AND ANALYSIS

Quantitative results

Of 29 potential returns, 17 submissions provided data for the week commencing 14th February 2011 (see table 2), and 18 were provided for the week commencing 28th March 2011 (see table 3);

Table 2:

	study	work	sleep	eat	personal	household	commute
AVERAGE	**53.2**	**1.5**	**54.1**	**13.7**	**31.6**	**6.3**	**7.4**
minimum	28	0	45.5	8	18	1	0
maximum	76	22	60.5	19	49.5	13	22.5

Student Hours Breakdowns, week commencing 14th February 2011

Commentary:

Study hours for the first week of the inquiry varied between 28 to 76 hours per week, with the sample average being 53 hours (13 more than the notional workload figure of 40 hours.) The average sleep hours per night approximated to 7.7, slightly above the notional 7 hours. Other averages approximated to the predicted hours of table 1 with the exception of 'personal' time which was approximately 32 hours per week compared with the notional average of 49. 'Work' hours did not appear to be excessive.

Table 3:

	study	work	sleep	eat	personal	household	commute
AVERAGE	**78.3**	**1.61**	**48.6**	**12.9**	**17.3**	**4.6**	**4.5**
minimum	53	0	35	8	8	0.5	0
maximum	103.5	21	58	18.5	38.5	16	13

Student Hours Breakdowns, week commencing 28th March 2011

Commentary:

Study hours for this week averaged almost double the notional 40 hours assumed in Table 1. Two respondents logged over 100 hours of study in this working week. Sleep averages approximated the 49 hours expected in the notional grid. As with the week commencing 14th February 2011, the outstanding 'deficit' was to be found in the 'personal' column, encompassing socializing, family, exercise, volunteering etc. Work hours on average were low, however one respondent logged 21 hours in one week, over and above study hours.

Qualitative Responses

Responses to the questionnaires were collated for each question. These responses were then analysed to see where correlations between the respondents occurred:

Study: The use of the studio was cited as being good for peer learning and community activities, but bad for concentrated learning. The balance of assignments' worth between studio design and taught modules was generally considered to be biased towards design projects, with studio work being the primary driver of long hours; *'I find that although the course is weighted 50:50 with regards to design work the timescale workload is not evenly balanced in fact it is more like 90:10 favouring design over written reports.'* Many students reported issues with clashes of assignment deadlines, and multiple deadlines were seen to be stressful. Many respondents stated that they tended to underestimate the time needed to complete assignments, and some students self-reported tendencies of displacement activity. The iterative and non-linear development of design was seen to prevent successful time planning. Time spent by students in the university design studio varied from 6 to 60 hours per week. Students also expressed concern at the time required to produce large scale models. Peer comparison with other courses of study in the School indicated that workloads for architecture students were higher than for students of other courses. Finally, some respondents confirmed that their personal responsibilities beyond the university (health, family, work etc.) made regular time-planning problematic.

Sleep: Over half the respondents cited problems with sleeping; All but two of the respondents had worked all night on assignments. Over two thirds of the respondents indicated that they suffered from poor quality of sleep, with 'thinking about work' being a consistent factor in disturbing their sleep patterns; *'Struggle to sleep due to stress of work, always feel I could be doing more. You can never do too much…a never ending task…visual work can always be improved with time.'* Some students were aware that lack of good quality sleep would affect their next-day performance; however, 'fear of failure' proved to be a key motivation in working extended hours.

Work: While the majority of respondents did not currently work, most also reported that there was a financial imperative to find work to support themselves; high course fees, lack of parental support, costs of materials and equipment were all cited as financial concerns. Students in employment generally worked long shifts (e.g. bar work), and it was reported that some employers provided little flexibility with respect to their employees' studies. Three respondents reported that they had stopped working in order not to jeopardize their studies, and that the long hours associated with architectural studies had influenced this choice; *I feel as the course is very intense I feel it is difficult to maintain a full time and even part time job.'*

Personal: The majority of respondents did participate in sport and leisure activities, but a number could not exercise on a regular basis due to study commitments; studies tended to take precedent over personal well-being. For some students exercise was required for health reasons, and for others, personal health issues affected their studies. Although the majority of respondents allowed time for social activities, it was cited by many that they had few opportunities to make friends outside their peer group in the course (*'Majority of friends in Newcastle are architecture students so I see them in the studio anyways'*). Studies also appeared to take precedent over social activities, although a small number maintained time for church, charity and volunteer work. Most poignantly, one respondent stated '*It is almost impossible to be in a relationship, as study always takes over. If you are not doing it you are thinking about it…'*

General: One respondent reported that dyslexia contributed to the pressures of students of architecture. A separate small-scale inquiry at Northumbria University indicated that almost a third of the students in this cohort suffer from dyslexia, and consequently spend even more time dealing with aspects of learning, time-management, and written assignments. Architecture, in common with several art and design courses, is a popular route for students who suffer from dyslexia. Links between dyslexia and artistic aptitude have been posited (Chakravarty, 2009). However, these abilities are counteracted by one or more of the symptomatic manifestations of dyslexia, which include poor organisational abilities; poor short-term memory; poor word-recognition, etc.

DISCUSSION

The limited sample size and the contextual specificity of this inquiry preclude any claims to general validity of the findings herein. However, the patterns of time allocation were of little surprise when one of the authors presented initial findings to members of the Standing Council of Heads of Schools of Architecture in April 2011. While the working conditions of trainee doctors have been well documented and discussed within the medical profession, the bodies entrusted with the professional standards of architecture have been relatively mute with respect to comparable issues.

Clearly, the hours spent on global 'study' were far in excess of the notional estimate, as displayed in the quantitative analyses for both weeks. Qualitative responses indicated that this excess was chiefly a product of the open-ended nature and complexity of studio design projects, corresponding with the findings of Bachman & Bachman (2006). Teaching staff consideration should therefore be made of the quantity, the limits, and the challenge of problem-based design projects; 'The student must have a reasonable *probability of success* in achieving the task.' (Biggs & Tang, 2009:92). Learning outcomes should not be vicariously assessed by quantity. Educationalists have argued that learning exercises which attempt to maximise coverage may consequently deny opportunities for deep learning (Gardner, 1993). However, architecture by its nature is a complex subject. And, although multiple deadlines were perceived by students as generating stress, this complexity mirrors authentic practice in the profession. Teachers should therefore carefully consider how best to carefully define the boundaries of project submissions – an equivalent to the word count of dissertations - to establish attainable outputs within defined time limits. The extrinsic motivation of 'fear of failure' could preferably be supplanted by an intrinsic motivation to learn and develop skills, without harm to the student's well-being.

However, there are conflicting issues intrinsic to architectural design in both education and practice which conspire against the ease of achieving these ideals. Critically reflective development improves design quality, and extensive development work is therefore valued by teachers of architecture. Consideration should therefore be made of how reflective practice is embedded in intended learning outcomes, evidenced successfully by outputs (which should not depend on unsustainable production), and the better management of expectations on the part of both staff members and students. Problem based learning is justifiably praised as an effective method of acquiring functioning knowledge and skills to creatively tackle complex issues (Biggs & Tang, 2009); however, this inquiry sees benefits in establishing clear boundaries to the complexity and/or scope of student design projects.

On the part of the student of architecture, valuable skills of self-regulation need to be acquired, preferably through the encouragement of the curriculum, but essentially through the student's own dispositions; 'In academic functioning…perceived academic efficacy to regulate ones' own learning activities, social efficacy to cultivate supportive interpersonal relationships, and self-regulatory efficacy to resist peer pressures for activities that undermine academic pursuits together account for substantially more variance in academic achievement than does academic efficacy alone.' (Bandura, 1996:337) Students who can acquire these skills draw upon a range of learning and self-management strategies, have belief in their own capabilities, and set themselves personal and professional goals;'…self-regulated learners engage in three important processes; self-observation (monitoring of one's activities); self-judgement (evaluation of how well one's own performance compares to a standard or the performance of others); and self-reactions (reactions to performance outcomes)' (Eccles & Wigfield, 2002:124)

Some degree of self-regulation can be ascertained from the findings. For example, the quantitative inquiry indicated that average hours of sleep were not dissimilar to those expected in Table 1, and with regards to all night working, one student reported *'This is counterproductive…so I've not done this recently.'* However, sleep-quality clearly appeared to be of concern with respect to the qualitative response. There is evidence that quality of sleep has a greater impact on next-day performance than quantity (Pilcher et. al. 1997). Researchers have also contested the perceived inflexibility of consecutive sleep patterns (Horne, 2011), and the long hours associated with design work may not necessarily be counter-productive; 'Activities we love fill us with energy even when we are physically exhausted. Activities we don't like can drain us in minutes, even if we approach them at our physical peak of fitness.'(Robinson, 2009:93) It would therefore appear sensible to evaluate research into what constitutes 'good quality' sleep behaviours, and disseminating these findings within the curriculum.

The balance of work and study could be further supported by mechanisms embedded within the curriculum. It can however be argued that there are direct and indirect benefits to be gained from a flexible mix of both; *'Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, differences, and disagreement are what drive the learning process.'*(Kolb & Kolb, 2005) This is empirically confirmed from the work of part-time students at Northumbria and other institutions, who have excelled in their studies, utilising their employment to establish fixed time-frames to structure their week. Clarification of the European Working Time Directive would also be beneficial with respect to a) whether the recommended maximum hours should cover study time alone, and b) the provision of an annual period of leave to study programmes. In general, the value of time needs to be considered more carefully in the profession, and in its education. Architecture continues to undervalue its use of time (Building Futures, 2011) in contrast with professions such as law.

Both quantitative and qualitative responses to this inquiry reported that the personal lives of the participants suffered as a result of perceived time-pressures. The subsequent loss of inter-personal opportunities and engagement with wider communities inhibits both the potential of networking and the development of a socially motivated profession; 'The study of architecture may highlight spatial intelligence, but an effective teacher of architectural design may well underscore and make use of logical, naturalist, and interpersonal perspectives.' (Gardner, 2007:33). The authors intend to report these findings back to the student body to jointly consider how best to develop the curriculum to optimise learning and wellbeing in the course.

(Word Count: 5095)

REFERENCES

1. The American Institute of Architecture Students (2002) *The Redesign of Studio Culture: A Report of the AIAS Studio Culture Task Force.* Available at: http://www.aiasnatl.org (Accessed: 19 May 2011)

2. Architects Registration Board (2010) *Architects Code: Standards of Conduct and Practice*. London: Architects Registration Board

3. Bachman, L. & Bachman, C. (2006) 'Student Perceptions of Academic Workload in Architectural Education.' In: *Journal of Architectural and Planning Research.* 23:4 (Winter, 2006), pp. 271-304

4. Bandura, A. (1997) *Self Efficacy: The Exercise of Control.* New York: Freeman

5. Bandura, A. (1996) 'Ontological and Epistemological Terrains Revisited.' In: *Journal of Behavior Therapy & Experimental Psychiatry.* Vol. 27, No. 4, pp. 323-345.

6. Barone, M.T.U. & Menna-Barreto, L. (2010) 'Diabetes and sleep: A complex cause-and-effect relationship.' In: *Diabetes Research and Clinical Practice.* 91 (2011) pp. 129-137

7. Boyer, E.L. & Mitgang, L.D. (1996) *Building Community: A new future for architecture education and practice: a special report.* Princeton: The Carnegie Foundation

8. Biggs, J. & Tang, C.(2009) *Teaching for Quality Learning at University.* 3rd edn. Maidenhead: Open University Press

9. Building Futures (2011) 'The Future for Architects?' Available at: http://www.buildingfutures.org.uk/assets/downloads/The_Future_for_Architects_Summary.pdf (Accessed: 19 May 2011)

10. Cai, D.J. et al. (2009) 'REM, not incubation, improves creativity by priming associative networks.' Available at: www.pnas.org/cgl/dol/10.1703/pnas.0900271106 (Accessed: 19 May 2011)

11. Chakravarty, A. (2009) 'Artistic talent in dyslexia – A hypothesis.' In: *Medical Hypotheses.* 73 (2009) pp. 569-571

12. Claxton, G. (1998) *Hare Brain Tortoise Mind: Why Intelligence Increases When You Think Less.* London: Fourth Estate

13. Collier, J. (2006) 'The Art of Moral Imagination: Ethics in the Practice of Architecture" *Journal of Business Ethics* (2006) 66: 307-317

14. Corbin, J. & Strauss, A. (2008) *Basics of qualitative research: techniques and procedures for developing grounded theory.* 3rd edn. Thousand Oaks: Sage

15. Dani, J. et al. (2005) 'The remarkable role of nutrition in learning and behaviour.' In: *Nutrition & Food Science.* Vol. 35 No. 4, 2005

16. De Graft-Johnson, A., Manley, S., Greed, C. (2003) *Why do Women Leave Architecture?* Available at: http://www.architecture.com/Files/RIBAProfessionalServices/Education/DiscussionPapers/WhyDoWomenLeaveArchitecture.pdf (Accessed: 19 May 2011)

17. Eccles, J.S. & Wigfield, A. (2002) 'Motivational Beliefs, Values, and Goals.' In: *Annual Review of Psychology.* 2002. 53: 109-32

18. Engle-Friedman, M. et.al. (2003)'*The effect of sleep loss on next day effort.'* In: *Journal of Sleep Research.* (2003) 12, pp. 113-124

19. European Commission (2003) Working Time Directive. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:299:0009:0019:EN:PDF

20. European Commission (2010) 'Reviewing the Working Time Directive'. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0106:FIN:EN:PDF

21. Gardner, H.W. (1993) 'Educating for understanding.' In: *The American School Board Journal.* July 1993, pp. 20-24

22. Gardner, H. (2007) *Five minds for the future*. Boston: Harvard Business School Press

23. Grandner, M. et al. (2009) 'Mortality associated with short sleep duration: The evidence, the possible mechanisms, and the future.' In: *Sleep Medicine Reviews* 14 (2010) pp. 191-203

24. Greely, H. et al. (2008) 'Towards responsible use of cognitive-enhancing drugs by the healthy.' In: *Nature,* Vol. 456, 11 December 2008 pp. 702-705

25. Horne, J. (2011) 'The end of sleep: 'Sleep debt' versus biological adaptation of human sleep to waking needs.' In: *Biological Psychology,* 87 (2011) pp. 1-14

26. Kivimaki, M. et al. (2011) 'Using Additional Information on Working Hours to Predict Coronary Heart Disease'. In: *Annals of Internal Medicine,* 154 (7): No 457 Apr 5 2011

27. Kolb, A.Y. & Kolb, D.A. (2005) *Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education.* In: *Academy of Management Learning & Education,* 2005, Vol.4, No.2, pp.193-212

28. Lingard, H. (2007) 'Conflict Between Paid Work and Study: Does it Impact upon Students' Burnout and satisfaction with University Life?' In: *Journal for Education in the Built Environment.* Vol. 2, June 2007, pp. 90-109

29. Nilsen, H. (2009) 'Influence on Student Academic Behaviour through Motivation, Self-Efficacy and Value-Expectation: An Action Research Project to Improve Learning.' In: *Issue in Informing Science and Information Technology.* Volume 6, 2009

30. Northumbria University (2010) 'Duty of Care: Good Practice Guidelines for Academic and Administrative Staff'. Available at: http://www.northumbria.ac.uk/static/worddocuments/ssdocs/duty_of_care.doc (Accessed: 19 May 2011)

31. Patel, S.R. (2009) 'Reduced sleep as an obesity risk factor'. In: *Obesity Reviews* 10 (Suppl. 2), pp. 61-68

32. Pilcher, J.J., Ginter, D.R., Sadowsky, B. (1997) 'Sleep Quality versus Sleep Quantity: Relationships Between Sleep and Measures of Health, Well-Being and Sleepiness in College Students.' In: *Journal of Psychosomatic Research,* Vol. 42, No. 6, pp. 583-596, 1997

33. Robinson, K. & Aronica, L. (2009) *The Element: How Finding Your Passion Changes Everything.* London: Penguin

34. Royal Institute of British Architects (2005) 'Code of Professional Conduct'. Available at: http://www.architecture.com/Files/RIBAProfessionalServices/ProfessionalConduct/Constitution/CodeOfConduct/2005RIBACodeOfProfessionalConduct.pdf (Accessed: 19 May 2011)

35. Schon, D.A. (1994) *The Design Studio: An Exploration of its Traditions & Potential.* London: RIBA Press

36. Schulman, L.S. (2005) 'Signature Pedagogies'. In: *Daedalus,* Summer 2005, 52-59.

37. Stein, M.B. et al. (2008) 'Impairment Associated With Sleep Problems in the Community: Relationship to Physical and Mental Health Comorbidity.' In: *Psychosomatic Medicine* 70:913-919 (2008)

38. Wenger, E. (2003) *Communities of Practice: Learning, Meaning, and Identity.* Cambridge: Cambridge University Press

39. Zajacova, A., Lynch, S.M., Espenshade, T.J. (2005) 'Self-Efficacy, Stress, and Academic Success in College.' In: *Research in Higher Education.* Vol. 46, No. 6, September 2005