Navigating the chasm from student to professional: The role of resilience
RICS COBRA AUBEA 2015

The Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors

The Australasian Universities’ Building Educators Association Conference

Held in Sydney, Australia in association with AUBEA, the University of Technology Sydney and University of Western Sydney

8 -10 July 2015

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ISBN: 978-1-78321-071-8

Royal Institution of Chartered Surveyors
Parliament Square
London
SW1P 3AD
United Kingdom

www.rics.org/cobra

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NAVIGATING THE CHASM FROM STUDENT TO PROFESSIONAL: THE ROLE OF RESILIENCE

Michelle Turner¹, Christina Scott-Young², Sarah Holdsworth³

¹,²,³ School of Property, Construction and Project Management, RMIT University, Melbourne, Australia

ABSTRACT

The construction industry has been described as dirty, difficult and dangerous, with workers experiencing high levels of stress, burnout, and work-life conflict. Resilience (the ability to rebound from stressful events) has been identified as a critical competence for working in challenging environments, however there has been scant academic attention to developing resilience in future construction professionals. To evaluate the resilience of built environment students, 107 final year undergraduates were surveyed using an adapted form of the Resilience at Work (RAW) scale. Exploratory factor analysis yielded six component behaviours that underpin resilience. Overall, students exhibited strengths in three resilience building behaviours (building networks/interacting cooperatively, staying healthy, and living authentically), but were less skilled in maintaining perspective. Local undergraduates and working students showed greater competence than international or non-working students in building networks/interacting cooperatively, and maintaining perspective, while project management undergraduates displayed the greatest ability of all in the latter. These findings suggest areas of future research to better understand the resilience profiles of students, and underline the imperative for integrating resilience training into the built environment curriculum. A focus on resilience development may better equip educators to assist students navigate to the chasm between university and professional practice in the workplace.

Keywords: built environment, graduate, professional practice, resilience, student.

INTRODUCTION

The construction industry has been described as dirty, difficult and dangerous. Workers of the construction industry are known to experience high levels of stress (Chartered Institute of Building 2006; Leung et al. 2008), burnout (Lingard and Francis 2009; Yip and Rowlinson 2006), and work-life conflict (Lingard et al. 2010). Outcomes are detrimental for the worker, the worker’s family, and the organization and include depression, substance abuse, chronic health problems, relationship breakdowns and intention to turnover (Maslach et al. 2001). The World Health Organization has predicted that by 2020 stress-related health conditions will constitute the second most debilitating workplace injury (Murray and Lopez 1996). Research has indicated that property and construction students have very high levels of burnout due to the pressures exerted from combining both work and university (Lingard 2007).

¹ michelle.turner@rmit.edu.au
² christina.scott-young@rmit.edu.au
³ sarah.holdsworth@rmit.edu.au
Curtis and Williams (2002) write of the “routinisation” of students combining paid work and study, suggesting that this is now the norm. Lingard (2005) found that hours spent in paid employment were at least as long and, in many cases, were in excess of hours spent at university for property and construction students. Despite an understanding of the construction industry as highly pressured and stressful, together with an understanding that students who combine work and study experience a high level of burnout, little research has explored how resilience may mediate the stress outcomes of both students and workers.

There is growing recognition by educators that resilience is a critical skill that can assist students in their transition to professional life. This paper considers how resilience has been conceptualized, reflects on resilience research undertaken in university settings, and then articulates the aims of the current study. The paper then describes the methodology applied in the research and presents and discusses the results.

LITERATURE REVIEW

Resilience

Resilience is defined as the ability to bounce back or recover from stressful circumstances in order to reach a whole adjustment to the environment (for example, see Ahern et al. 2006; Smith et al. 2008; Tusaie and Dyer 2004). Windle (2011, p.152) describes resilience as “the process of negotiating, managing, and adapting to significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate the capacity for adaptation and ‘bouncing back’ in the face of adversity”. Importantly, resilience has been linked to maintaining physical and psychological health, and having the ability to recover more quickly from stressful events (Ryff and Singer 2003).

There are emerging empirical data which position resilience as an important skill for professionals. Grant and Kinman (2013) contend that developing resilience will enhance wellbeing, job satisfaction and retention. Dulewicz and Higgs (2003) identified emotional resilience as a leadership competency, encompassing the ability to maintain consistent performance in a range of situations, and retaining focus on a course of action or the need to obtain certain results in the face of personal challenge or criticism. Müller and Turner (2010) contend that emotional resilience forms part of the leadership competency profile of successful project managers. However, conceptualizations of resilience have varied widely. For example, Werner (1992) contends that resilience is linked to a high level of autonomy, empathy, better problem solving skills and supportive peer relationships. In contrast, Grant and Kinman (2012) attribute resilience to well-developed reflective skills, social confidence, flexible coping types, and strong social support networks.

There is growing evidence that resilience is not an innate, fixed characteristic, but is a set of behaviours which can be taught and developed through carefully targeted interventions (McAllister and McKinnon 2009; McDonald et al. 2013) and controlled exposure to moderately difficult situations (Seery 2011). Similarly, Winwood et al. (2013, p.1206) contend that resilience “can be consciously and deliberately considered and modified through appropriate skills training”.
Student resilience

Resilience research undertaken in university settings has been somewhat fragmented due to: (i) the application of inconsistent definitions which seek to identify the dimensions underpinning the construct (for example, DeRosier et al. 2013; Grant and Kinman 2012; Wang 2009); (ii). the use of different measures of resilience, some of which have limited psychometric properties (Ahern et al. 2006; Windle et al. 2011); (iii). measuring constructs considered to be related to resilience, rather than measuring resilience directly (Hassim et al. 2013; Tung et al. 2014); and (iv). positioning resilience as a dispositional trait (Sagone and DeCaroli 2014), while other studies position resilience as a skill which can be developed (Pidgeon et al. 2014). Research has typically investigated students’ resilience within a specific study discipline, such as law (Sagone and De Caroli, 2014; Watson and Field 2011), social work, nursing and midwifery (Grant and Kinman 2013), medicine, and engineering (Sagone and De Caroli 2014). Much of the extant research in university settings considers resilience and its impact on preventing mental health problems (e.g., DeRosier et al. 2013), while limited research has focused on resilience as a work ready graduate attribute.

AIM

To date, little research has explored the resilience of students undertaking studies in the built environment. It is considered that resilience development is an important skill that will increase the likelihood of positive employment outcomes in the stressful environment of the construction industry. With the demand for work ready graduates increasing, the capacity of educators to prepare students for the built environment sector is a challenge. This research seeks to address this gap by adapting a dimension-based measure of resilience to explore the resilience profile of future construction professionals, as well as exploring the dimensions underpinning their resilience. This knowledge will be used to explore whether the current level of resilience of future construction professionals is considered adequate, or whether specific development of this skill is required through targeted interventions and university curriculum renewal.

METHODS

Undergraduates studying in the property, construction and project management disciplines at RMIT University in Melbourne, Australia, were invited in 2014 to complete a resilience questionnaire. The students were enrolled in their fourth (final) year of a Bachelor of Applied Science degree. The paper based questionnaires were administered during class time in the final weeks of their last semester.

Resilience measure

Resilience was measured using Winwood et al.’s (2013) Resilience at Work (RAW) scale, which was developed originally to measure the resilience of employees already in the workplace. This scale was chosen as it considers resilience as a skill which can be developed through carefully targeted interventions, and which is underpinned by behavioural dimensions considered important for resilience development. This is in contrast to other measures which either conceptualize resilience as a uni- or bi-dimensional construct, or presuppose resilience to be a dispositional trait. The RAW measure has demonstrated good internal consistency reliability ($\alpha=0.84$) (Winwood et al. 2013). The 20 item scale has seven subscales: (1) living authentically (three items); (2) finding one’s calling (four items); (3) maintaining perspective (three items); (4) managing stress (four items); (5) interacting cooperatively (two items); (6) staying healthy (two items); and (7) building networks (two items). Internal consistency
reliability for the seven subscales was reported to vary between 0.89 (building networks), 0.63 (interacting cooperatively), and 0.60 (staying healthy). Internal consistency reliability was not reported for the other four sub-scales (Winwood et al. 2013). Whilst acknowledging that the internal consistency reliability for the building networks, and interacting cooperatively sub-scales were not optimal, Winwood and his colleagues chose to retain them as discrete scales because they “both represent areas of deliberate behavior that are considered valuable activity in resilience work development” (Winwood et al, 2013, p.1207).

The RAW is a relatively new measure, which, to the authors’ knowledge, has not been previously administered in a tertiary setting. In order to render the RAW scale applicable to the university context, items were adapted so that the word ‘work’ was substituted by ‘university’. Examples of the items include “The university work that I do fits well with my personal values and beliefs”, and “I have a strong and reliable network of supportive students at university”. Instructions given to participants specified that the questions referred to their experience at university, including the time spent at university, as well as the time spent on studies outside of university. Participants were asked to indicate their agreement with the items on a seven-point Likert scale (0 to 6), from ‘strongly disagree’ to ‘strongly agree’. Two items were reversed coded; “When things go wrong at university, it usually tends to overshadow the other parts of my life”, and “Negative people at university tend to pull me down.

Analysis
The survey responses were entered into SPSS (version 22) and the data were cleaned. The first step was to examine the factorial structure of resilience to confirm the seven factors reported by Winwood et al. (2013). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO), Bartlett’s Test of Sphericity, and the correlation matrix scores were reviewed first to ascertain whether the dataset was suitable for factor analysis (Pallant 2007). Following this, the structure of resilience among the sample was examined using exploratory factor analysis, (namely Principal Component Analysis (PCA) with varimax rotation), since the scale had not been previously administered in a university setting. The next step was to determine the internal consistency reliability of each of the component subscales by computing Cronbach’s alpha (α) and confidence intervals (CI). Following the achievement of acceptable internal consistency reliability of the sub-scales, means and standard deviation scores were calculated, and then one-way analysis of variance between groups (ANOVA) and independent-samples t-tests were performed.

RESULTS
Sample
One hundred and seven surveys were completed, which represented 54% of all students enrolled in their final semester of a four year Bachelor of Applied Science degree. Of those participants, 60.7% (65) were enrolled in the construction management discipline, 22.4% (24) were enrolled in project management, and 16.8% (18) were in the property discipline. Eighty-four percent (90) of participants were male and 16% (17) were female, which was representative of the overall gender ratio in the total final year cohort. The majority of students were local (85%), and working (78%). Of those students who worked, the mean hours per week was 27 (SD=10).
Principal components analysis

As 107 participants completed the 20 item scale, the subject to item ratio of approximately 5:1 was considered appropriate for factor analysis, given that some studies have used a ratio of 3:1 (Costello and Osborne, 2005). Furthermore, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) value was 0.76, the Bartlett’s Test of Sphericity was significant (p=0.000), and the correlation matrix revealed the presence of many coefficients of 0.30 and above, therefore verifying that the dataset was suitable for factor analysis (Pallant 2007).

The exploratory factor analysis (PCA) did not yield a seven-factor structure representing the seven components of resilience as suggested by Winwood et al. (2013). Finding one’s calling was the only sub-scale which was replicated in its original structure. Analysis yielded a six factor structure which explained 63.74% of the variance. The rotated components matrix is shown in Table 1, in which loadings of 3.0 or more are displayed. Factor one had an eigenvalue of 5.02 and explained 25.12% of the variance, and represented finding one’s calling. Factor two had an eigenvalue of 2.19 and explained 10.99% of the variance, and included all items from living authentically plus one item from the interacting cooperatively subscale. Factor three had an eigenvalue of 1.66 and explained 8.35% of the variance, and included all items from building networks plus one item from the interacting cooperatively subscale. Factor four had an eigenvalue of 1.44 and explained 7.22% of the variance, and included all items from staying healthy, plus one item from the managing stress and maintaining perspective subscales. Factor five had an eigenvalue of 1.35 and explained 6.75% of the variance, and represented managing stress. Factor six had an eigenvalue of 1.06 and explained 5.31% of the variance, and represented maintaining perspective. Cronbach’s alpha coefficients and confidence intervals were calculated to ascertain the internal consistency reliability of the factors. Results indicated α=0.79, CI 95%: 0.73 – 0.85 (factor one), α=0.63, CI 95%: 0.51 – 0.74 (factor two), α=0.75, CI 95%: 0.67 – 0.83 (factor three), α=0.67, CI 95%: 0.57 – 0.77 (factor four), α=0.71, CI 95%: 0.60 – 0.80 (factor five), and α=0.66, CI 95%: 0.51 – 0.77 (factor six). While the internal consistency reliability of some subscales was not optimal, this may have been a function of the small number of items in the subscales. These subscales were retained as they represented areas of behaviour which are considered valuable components in resilience development.

Table 1. Rotated component matrix for the resilience items

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Principal component</th>
</tr>
</thead>
<tbody>
<tr>
<td>My university is somewhere where I feel that I belong.</td>
<td>Finding one’s calling</td>
<td>.83</td>
</tr>
<tr>
<td>The university work that I do fits well with my personal values and beliefs</td>
<td>Finding one’s calling</td>
<td>.81</td>
</tr>
<tr>
<td>The university work that I do helps to fulfil my sense of purpose in life.</td>
<td>Finding one’s calling</td>
<td>.77</td>
</tr>
<tr>
<td>Generally I appreciate what I have in my university environment</td>
<td>Finding one’s calling</td>
<td>.62</td>
</tr>
<tr>
<td>I know my personal strengths and I use them regularly at university</td>
<td>Living authentically</td>
<td>.76</td>
</tr>
<tr>
<td>I often ask for feedback so that I can improve my university</td>
<td>Interacting cooperatively</td>
<td>.65</td>
</tr>
<tr>
<td>I have important core values that I hold fast to in my university life.</td>
<td>Living authentically</td>
<td>.32</td>
</tr>
<tr>
<td>I am able to change my mood at</td>
<td>Living authentically</td>
<td>.49</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Item</th>
<th>Resilience profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have friends at university whom I can rely on to support me when I need it.</td>
<td>Building networks</td>
</tr>
<tr>
<td>I have a strong and reliable network of supportive students at university.</td>
<td>Building networks</td>
</tr>
<tr>
<td>I believe in giving help to my university colleagues, as well as asking for it.</td>
<td>Interacting cooperatively</td>
</tr>
<tr>
<td>I am careful about eating well and healthily.</td>
<td>Staying healthy</td>
</tr>
<tr>
<td>I have a good level of physical fitness.</td>
<td>Staying healthy</td>
</tr>
<tr>
<td>I am careful to ensure that my university work does not dominate my personal life.</td>
<td>Managing stress</td>
</tr>
<tr>
<td>Nothing at university ever really “fazes me” for long.</td>
<td>Managing perspective</td>
</tr>
<tr>
<td>I have developed some reliable ways to relax when I am under pressure at university.</td>
<td>Managing stress</td>
</tr>
<tr>
<td>I make sure I take breaks to maintain my strength and energy when I am working hard at university.</td>
<td>Managing stress</td>
</tr>
<tr>
<td>I have developed some reliable ways to deal with the personal stress of challenging events at university.</td>
<td>Managing stress</td>
</tr>
<tr>
<td>Negative people at university tend to pull me down</td>
<td>Maintaining perspective</td>
</tr>
<tr>
<td>When things go wrong at university, it usually tends to overshadow the other parts of my life</td>
<td>Maintaining perspective</td>
</tr>
</tbody>
</table>

### Resilience profiles

The mean and standard deviation for each factor was calculated, and scores for each of the factors ranged from “slightly” to “neither agree nor disagree”. Factor three (building networks/interacting cooperatively) displayed the highest mean score, (mean=4.51, SD=1.00), followed by factor four (staying healthy) (mean=4.18, SD=0.97), factor two (living authentically) (mean=4.07, SD=0.84), factor one (finding one’s calling) (mean=3.99, SD=0.94), factor five (managing stress) (mean=3.89, SD=1.05), and factor six (maintaining perspective) (mean=3.32, SD=1.39).

A between groups analysis of variance (ANOVA) was conducted to explore the profile of resilience components between the property, construction and project management disciplines. There was a statistically significant difference for factor six (maintaining perspective) between property and project management students (F (2, 101) =4.68, p=0.01). Post-hoc comparisons using the Tukey HSD test indicated that the mean score for property students (mean=2.38, SD=1.09) was significantly different from project management students (mean=3.70, SD=1.27).

An independent-samples t-test was conducted to compare the resilience components for males and females, however no significant differences were found. An independent-samples t-test revealed that there was a significant difference between international (mean=3.39, SD=1.14) and local respondents (mean=4.20, SD=0.92) for component three (building networks/interacting cooperatively), (t (104) = -3.13,
p=0.002). A significant difference was also found for component six (maintaining perspective). The mean score for international respondents (mean=2.46, SD=1.27) was lower than for local respondents (mean=3.35, SD=1.42; t (102) = -2.28, p=0.024).

An independent-samples t-test was conducted to compare the resilience components for respondents who worked (mean=4.24, SD=0.90) and those who didn’t (mean=3.55, SD=1.13) and a significant difference was revealed for component four (building networks/interacting cooperatively) (t (104) = 3.08, p=0.003). A significant difference was also found for component six (maintaining perspective). The mean score for respondents who worked (mean=3.40, SD=1.41) was higher than for respondents who did not work (mean=2.63, SD=1.35), t (102) = 2.33, p=.022).

DISCUSSION
This study had two main aims: (i). to explore the dimensions that underpin resilience in built environment students and (ii). to develop a resilience profile of construction, property and project management final year undergraduates to determine their resilience building needs. The results suggest that the adapted Resilience at Work (RAW) scale, with the referent changed from “work” to “university”, shows promise in measuring resilience dimensions in tertiary students. Two of the RAW components, building networks and interacting cooperatively, loaded onto a single factor in the present study, and have been relabelled as building networks/interacting cooperatively. The remaining five factors (living authentically, finding one’s calling, maintaining perspective, managing stress, and staying healthy) are similar to the structure reported by Winwood et al. (2013) for non-student samples.

The survey identified a pattern of general strengths and weaknesses in the six resilience dimensions across the student cohort. Overall, students were strongest in building networks/interacting cooperatively. This is not surprising since collaborative teamwork is considered to be a core competency which is developed continuously throughout the four year bachelor’s degree. The students also exhibited a strength in staying healthy, a cultural value important among young Australian males, who comprised the majority of this sample. Students showed moderate strength in living authentically, and finding one’s calling, a finding that may reflect the late stage of their degree. Undergraduates who have persisted in studying their chosen discipline for four years are likely to experience certainty that they are being true to their career aspirations, which in turn fosters resilience in the face of adversity. Students were on average lower in the remaining two components of resilience. They exhibited relatively less ability for managing stress, and their least developed resilience attribute was maintaining perspective, causing many of them to allow negative events at university to upset them and overshadow other areas of their lives. These findings pinpoint potential areas for intervention and skills development.

The modified RAW scale demonstrated good discriminative ability, producing a variety of student profiles based on demographic characteristics. Students who worked demonstrated greater skill in the resilience building dimension of maintaining perspective than non-working students, a finding that potentially contrasts with Lingard’s (2007) report of greater burnout amongst working students. One possible explanation lies in Seery’s (2011) contention that a U-shaped relationship exists between adversity and resilience, with either too few or too many adverse events producing negative effects, whilst the experience of some difficulties can actually
develop resilience. It appears that in the current sample, the challenge of combining work with study did not produce the kind of extreme adversity which would result in burnout, but was likely more moderate in intensity, thus producing the positive resilience building benefits of medium levels of adversity. Students who worked also displayed stronger skills in building networks/interacting cooperatively than nonworking students, suggesting that working while studying heightens their awareness of the need to collaborate and encourages them to draw more on positive peer support to assist them in their studies.

Local students revealed a different resilience profile to international students, showing greater ability in building networks/interacting cooperatively and in maintaining perspective. This finding highlights the vulnerability of international students who have been dislocated from their established support networks and who may face cultural barriers to developing new peer networks at university. Encouraging participation in peer mentoring programs and in structured work experience and internships may bolster these two important dimensions of resilience in international undergraduates. One final difference between student profiles was related to the discipline studied. When compared with property respondents, project management undergraduates demonstrated greater ability in maintaining perspective, suggesting that they had a higher capacity to reframe setbacks, maintain a solution focus, and manage negativity. This finding may be a reflection that project management theory and techniques actively address and foster such practices. It may be that greater inclusion of project management courses in the property degree curriculum would assist in developing this particular resilience building attribute among property undergraduates.

**CONCLUSIONS**

While a number of scales have been developed for measuring resilience, they are not widely adopted, and no one scale is preferable over the others (Windle et al. 2011). This has led to limitations in comparing the nature of resilience across studies, constraining the progress of resilience research within university settings. The current study adapted one of the more recently developed scales, Resilience at Work (RAW), to study final year built environment students. Factor analysis revealed a modified structure to the original scale, which was developed for people already employed in the workplace. Further testing is recommended of the version modified for students to explore whether this new factor structure holds in larger samples of built environment students.

Prior to this study, the resilience profile of future professionals of the construction industry was not well understood. Furthermore, it was not clear whether the cohort of future professionals was homogenous, or whether resilience levels differed according to gender, discipline (property, construction and project management), student type (local or international), or work status. The new understanding developed from the current study provides a platform from which future resilience skills programs can be developed. The outcome of this research suggests that a ‘one-size-fits-all’ approach is not appropriate, and such a program should be tailored to meet identified subsets of students (e.g., discipline specific; local/international; working/not working) so as to enhance their overall level of resilience in preparation for entrance into the stressful and ever-changing property and construction industry environment.
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