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BUILDING RESILIENCE: DEVELOPING A RESILIENCE TOOLKIT FOR EMPLOYABILITY IN BUILT ENVIRONMENT GRADUATES

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ABSTRACT

Upon graduation from University many students lose access to support structures such as peers, academic mentoring, etc. This may lead to tension, stress and failure to perform effectively in new workplaces, especially if the workplace itself is stressful. This is particularly the case for graduates who move into work within construction, as this industry provides a uniquely stressful environment where the development of resilience is imperative for success. The ability to cope and draw on resilience skills provides answers for built environment graduates. The development of resilience skills is not included as learning outcomes within courses, units of study or programs of learning within the built environment discipline. This dilemma, from a student’s perspective, draws us to the rationale of the proposed research and its aim to show the development of a resilience toolkit for built environment students. There is considerable evidence that incorporating resilience skills into undergraduate curricula in built environment disciplines will have positive outcomes. Outcomes from an initial review of 3 participating University undergraduate programs, devised to determine resilience training for undergraduates is presented. A compilation and collection of noteworthy examples where resilience learning and teaching exists in undergraduate curricula will also be identified.

Keywords: Resilience, Employability, Built Environment, T&L, Stress

INTRODUCTION

Research by the team has identified that the broader concept of resilience, including the ability to cope in a potentially stressful work environment is not the focus of learning in University environments. Graduates leave universities in built environment (BE) disciplines with
little or no training in resilience skills and commence work in a stressful, complex industry (Haynes & Love, 2004). This project describes a resilience toolkit for BE students that will underpin their discipline studies whilst providing them with tools for coping in a stressful industry upon graduation. This study is unique in that it tackles the under-researched area of resilience in undergraduate education in this discipline. The need is significant as Sutherland & Davidson (1993) note:

"Graduates often experience extreme stress and high role conflict as a consequence of the trade-off between cost, time and quality performance in construction projects... we need to better prepare our young graduates for this industry or we lose them forever." (p.281)

CONSTRUCTION RESILIENCE

Construction and built environment companies operate in a highly competitive market with relatively low profit levels. Projects run with tight deadlines and have budget constraints. The industry is the epitome of a project-based environment where graduates work on projects that are planned, designed and built by a complex contractual web of individuals and companies. This complex web of project interfaces often results in project fragmentation, disjointed work, unexpected delays, changes, conflicts, adaptations and disruption. With the threat of significant penalties for time and cost overruns, one-off type projects, poor onsite and safety conditions and the stress of managing in a project environment, young graduates are often un-prepared for the mental strength required of them in such environments. Resilience is a term with roots in ecological systems theory (Holling, 2001) that has evolved to be defined slightly differently by various disciplines. In the context of this project, resilience can be defined as “good outcomes in spite of serious threats to adaptation or development” (P.391). Within this study, the term resilience will apply to behavioral, attributional or emotional responses to shocks and challenges graduates will inevitably face upon entering the construction industry.

Dainty (2004) notes the enormous pressure on construction graduates by providing insights into the psychological expectations of construction managers which further highlights the importance of resilience in stressful, unplanned situations. In comparison to managers of other disciplines, the level of stress encountered by construction project managers is significantly higher than that of managers in other industries (Haynes & Love, 2004). Construction workers are more than twice as likely to suicide as any other group of people in Australia, and are six times more likely to die by suicide than through a workplace accident. With nearly one million construction workers in Australia, mental stability on construction sites is now a serious industry concern. (MBAV, 2014, Mates in Construction, 2009)
It is widely recognised that mental health is ‘fundamental to physical health, quality of life and productivity’ (Beltman & MacCallum, 2006) and particularly important in young adults, as it underpins health and wellbeing throughout later life. Consistent with international trends, developing resilience has been a recent focus in policy and practice in a number of disciplines in tertiary education in Australia. However, whilst a number of other industries have recognised the importance of resilience training and its inclusion in undergraduate curricula, the built environment discipline, including construction management, has failed to address resilience or emotional work-readiness at the undergraduate level in Australia. The most recent research examining the stress of built environment work (Lingard & Francis, 2006) and the need to address resilience at an industry level (MBA, 2014) has failed to translate into meaningful national curricula or useful resources for academics teaching into these disciplines. Despite calls by employer groups to address its significance and prevalence amongst built environment professionals (Sommerville & Langford, 1994; Haynes & Love, 2004), resilience has not been addressed systematically in undergraduate curricula in this discipline.

**PROPOSED OUTCOMES AND DELIVERABLES**

This project will value-add to construction management curricula preparing students for built environment industries by examining existing construction management curricula for any best practice examples of resilience learning and teaching. The project will complete an audit of resilience learning and teaching in undergraduate programmes and incorporate these best practice examples into a “resilience toolkit“ which can be accessed by all academics in this discipline. The Toolkit, by being made available to students will provide practical guidance and reference. Disseminating the toolkit at the national conference of all built environment disciplines at the Australian Universities Building Educators (AUBEA) conference and engaging academics in resilience discussions will lay the foundations for further applications to be added to the toolkit into the future, as well as extension of the project beyond the built environment discipline.

Construction and built environment activity is a critical engine of innovation and growth for a nation’s economy. Retention of work-ready, high quality graduates, able to cope with challenges and industry stress, are a critical underpinning for Australia’s future. Whilst the emphasis remains on preparing graduates with high-level technical skills only, the loss to the industry of skilled graduates and the cost to the Australian economy are considerable. Developing and reviewing the role of resilience in built environment programmes and providing a toolkit for discipline academics to utilise has the potential to improve work-readiness, career
outcomes and long-term employability for all built environment graduates and to add to industry productivity.

This project is a partnership between three tertiary providers of built environment education in Australia: RMIT; Deakin; and the University of Newcastle and has a number of distinct features enabling project delivery:

- An audit of a representative sample of built environment programmes in Australia to identify extent and quality of resilience training.
- An online toolkit/ resource site of case studies & practical resilience problem solving exercises for use by all built environment academics in Australia.
- Improved understandings of built environment academics on the value of resilience training.
- Project dissemination through academic journals, final report and presentations at AUBEA 2016/17 conference.

**VALUE/ NEED FOR THE PROJECT**

The Importance of work-ready, resilient graduates in built environment disciplines - Preparing work-ready graduates for current and future industry workplaces requires resilience skill training for undergraduate students. Reducing the unacceptably high levels of poor mental health that contributes to a suicide rate, which is the highest of any industry in Australia (MBAV, 2014). Sutherland and Davidson (1993) suggest that built environment students have to cope with severe tension in their life balance and many leave the industry altogether. According to Sommerville and Langford (1994), this is largely due to the nature and characteristics of the built environment industry within which they operate. There is also evidence that suggests male construction professionals, in particular, experience extreme occupational stress, related to the type of work undertaken onsite (Lingard & Francis, 2006). Dainty (2004) also notes the enormous pressure on built environment graduates by providing insights into the psychological expectations of construction managers. His research highlights several key issues contributing to industry personnel stress, such as recognition of contribution to the organisation, training, job security, career development, consultation and communication with employees, support with problems, and handling unexpected issues in the workplace. It is likely that all of these have an impact and create pressure on graduates entering the industry for the first time from university. This project will address these needs by direct communication (documentation and dissemination of the value of embedding resilience skills in the curriculum) with Professional Associations (AIB, AIQS), Employer groups (MBA, HIA) and higher education associations (AUBEA). This will be followed with the production and distribution of a resilience toolkit as a
The built environment and construction industry is vital to the Australian economy and a major contributor to economic growth. According to the Australian Bureau of Statistics the industry accounted for 9.5% of GDP in 2013 and 9.1% of the total workforce (ABS, 2014). It is the fourth largest industry in Australia by both economic value and employment. The need for this project has been identified by employer groups and graduates (MBAV, 2014, Mates in Construction, 2009) and because of the size and value of the industry, the need for a resilient professional workforce is critical.

The importance of current, industry input into built environment curricula

there is considerable evidence that incorporating resilience skills into undergraduate curricula in built environment disciplines will have positive outcomes. Hiltrop (1996), in examining mechanisms that secure a positive relationship in built environment professionals, concluded that there are a number of useful activities that could enhance the student experience and promote resilience in graduates. These included the promotion of construction as a team oriented project-based endeavour with team responsibilities; activities that identify lines of communication that support empowerment and illustrations of the positive and negative aspects of the role to undergraduates. This project will include consultation with employer groups through the industry roundtable around the type of resilience training required for construction graduates.

The recognition of personal development and professional satisfaction in graduate outcomes

resilience can be described as a class of phenomena characterized by good outcomes in spite of serious threats to adaptation and development (Beltman et al., 2006). The importance of resilience as a graduate outcome is steadily increasing in built environment disciplines due to the nature of the work and its changing practices. Since resilience is conceptualised in terms of ‘rebouncing back after adversity’, or overcoming adversity to ‘achieve good developmental outcomes’ its development in built environment curricula can be seen as contributing to strong capacity in individuals, in particular graduates undertaking management roles in industries such as the built environment. This project will advance this concept through its dissemination processes and toolkit resources.
The value of resource sharing and collaboration in curriculum development

This project value-adds to existing initiatives aimed at building resilience into undergraduate programmes by producing an audit of programmes. It will draw out any existing best practice resilience learning in current built environment curriculum and supplement it with other industry examples. The resulting “resilience toolkit” will be introduced to all 15 providers of built environment education at the annual AUBEA conference in 2015, thus enabling resource sharing and collaboration.

PROJECT APPROACH

This project will be undertaken in four distinct stages over a 12-month period. The project team consists of senior members of the built environment academic cohort, who, through their roles in AUBEA and programme accreditation, are familiar with academic staff at all 15 institutions teaching this discipline. This will facilitate each of the project stages, as well as add credibility to the project.

STAGE 1. RESILIENCE AUDIT AND MAPPING

This stage will consist of a review of the tertiary courses in built environment disciplines at all (or most of) 15 universities offering the programme. Courses will be audited for evidence of resilience skill training. Interviews will be held with academic staff and students to assess their understanding of resilience and its position in the undergraduate curriculum of this discipline. An industry roundtable will be held to determine industry requirements in resilience training for undergraduates.

As the project is in an early part of stage one a preliminary review of the project team members Universities is offered.

CONSTRUCTION MANAGEMENT AT UNIVERSITY OF NEWCASTLE

The Bachelor of Construction Management (Building) at the University of Newcastle (UoN) provides a holistic view of the building and construction management environment. Through a variety of teaching approaches that simulate the real-life situations facing construction professionals, students develop the skills needed to monitor and control the technical process of construction. They also learn how to manage the legal and financial aspects associated with the building industry.

Table 1 identifies several courses within the CM University of Newcastle program and a Learning Outcome Identifier that suggests the inclusion of resilience training. It is suggested further in depth review has the potential to show where resilience training would most likely eventuate. Column 3 represents an early iteration of the audit, in depth analysis and
interview of the various academic and industry stakeholders identified will follow ethics approval to populate a comprehensive analysis document.

CONSTRUCTION MANAGEMENT AT RMIT

Auditing resilience as a theme in Built environment undergraduate education at RMIT is complex, and like all graduate outcomes, not easily or neatly measured. Evidence of resilience skill training is not specific in any one course or series of courses, yet students have the opportunity in a range of courses around management, leadership, communication and professional practice/capstone to discuss and develop resilience. The actual development of resilience is not measured and is seen as a maturation process as students move through the degree. What is clear is that much of the resilience development is implicit rather than explicit in any built environment degree. No specific course deals with the stress and management resilience required in the industry, although management skills are addressed. However, the focus is upon graduate entry-level skills development primarily in construction and project management. To date no emphasis is placed upon resilience.

CONSTRUCTION MANAGEMENT AT DEAKIN

At Deakin University the core skills for work (getting on with colleagues, making critical decisions, solving problems) are refined further and are based on the Core Skills for Work (CSfW) Developmental Framework (DIIRSTE & DEEWR, 2013) which is useful for understanding resilience in these three broad areas:

- navigating the world of work including managing career and work life, and understanding work rights, roles and protocols.
- interacting with others including communicating for work, connecting and working with others, and recognising and utilising diverse perspectives.
- getting the work done including planning and organising, making decisions, identifying and solving problems, creating and innovating, and working in a digital world.

Graduate attributes are often referred to as 'soft skills' and provide the foundation career building blocks for students. The development of a student's graduate attributes is often centred on skills related to "getting the work done". Although some student activities focus on "interacting with others" this is often delivered in the context of learning rather than work. The Deakin Bachelor of Construction Management builds on Graduate Learning Outcome (GLO) 6. Self-management: working and learning independently, and taking responsibility for personal actions, is the one that we use to encompass resilience.
<table>
<thead>
<tr>
<th>COURSE</th>
<th>LEARNING OUTCOME IDENTIFIER</th>
<th>RESILIENCE AUDIT AND MAPPING COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3   Introduction to the Construction Industry</td>
<td>2. Articulate the structure, behaviour and stakeholders of the construction industry from a number of perspectives.</td>
<td>Identifying to students the nature and complexity of construction management in the early stages of a course is positive.</td>
</tr>
<tr>
<td>6   Cost Planning and Estimating</td>
<td>3. Price conforming tenders with available information.</td>
<td>The process of providing conforming tenders would identify to students some of the pressures in the sector.</td>
</tr>
<tr>
<td>7   Construction Procurement and Tendering</td>
<td>3. Analyse and select an appropriate procurement method and standard form of contract to meet stakeholder requirements</td>
<td>An understanding of the continuum and alternatives of project delivery would help students understand the benefits of relationships in the industry</td>
</tr>
<tr>
<td>9   Construction Business Management</td>
<td>1. Review the management function in the context of a firm operating in the construction industry.</td>
<td>Providing students with a broad understanding of SMEs operating in the sector shows the complexity of interactions.</td>
</tr>
<tr>
<td>11  Contract Administration</td>
<td>3. Implement and advise on administrative procedures necessary for the successful running of a construction contract.</td>
<td>Showing students potential interactions in project delivery and the network of engagement in the supply chain would deepen their understanding of resilience</td>
</tr>
<tr>
<td>12  Construction Entrepreneurship</td>
<td>3. Simulate the management of a construction companies</td>
<td>The ‘real-world’ of simulation embeds positive attributes in managing tensions</td>
</tr>
</tbody>
</table>
Stage 1 sets out the review and preliminary desktop research stage, following the researchers describe 3 following stages that include; identification of resilience best practice resources, development of the resilience toolkit and dissemination of the final toolkit that will complete the project.

**NEXT STEPS: STAGES 2-4**

Stage 2. Identification of Resilience Best Practice Resources

This stage will involve the compilation and collection of best practice examples of resilience skill training in the undergraduate curricula. The examples will be developed into broad problem-solving cases for ready use by other academics with other examples added to the initial resources arising from this project’s development.

Stage 3. Development of Resilience Toolkit

In this stage a “resilience toolkit” will be developed. Selected examples from universities, supplemented with non-construction case studies will be complied into a toolkit for trialling.

Stage 4. Dissemination and trialling of toolkit at other universities

In this stage, the toolkit will be trialled and evaluated at the 3 project team members’ universities. Appropriately revised toolkits will be disseminated to all universities providing built environment education through the AUBEA conference. It is anticipated that the toolkit will also be available online for access by all discipline academics.

**CONCLUSION**

In the foregoing the researchers have presented an introduction to, and identified the need for resilience training in construction and built environment related courses. It is suggested that there is little activity in this area and the proposed project will fill a gap in the current body of knowledge associated with resilience and coping skills training in built environment programmes. A preliminary survey has been undertaken at three universities where construction management is taught, it has been identified that whilst there is an awareness of the need for resilience training within construction management courses there is little in the way of explicit and structured content currently included in present curricula. The project presented proposes to redress this through the balance of the year.
REFERENCES


