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ABSTRACT

Introducing practices to reduce the work-related injuries in the construction industry is a continual challenge, specifically in WA where the industry is experiencing a second development boom. In 2006, Worksafe WA responded by introducing pre-site mandatory certification in safety awareness training for all construction employees. This paper reviews the impact of this training on the *housing and civil* sectors of the industry. It is a mixed mode study presenting the lost time injury/disease statistics, perceptions of the stakeholders from survey responses, and from subsequent interviews. The findings indicate a positive cultural change within the industry but an increasing scepticism about online assessment and certification procedures with evidence that some cut corners rather than engage in learning. The final research report from this study has confirmed the *value* this training initiative has for the industry. The *voice* of the discussion now focuses upon how to protect the validity of the training and certification processes.

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Introducing practices to reduce the work-related injuries in the construction industry is a continual challenge, specifically in WA where the industry is experiencing a second development boom. In 2006, Worksafe WA responded by introducing pre-site mandatory certification in safety awareness training for all construction employees. This paper reviews the impact of this training on the *housing and civil* sectors of the industry. It is a mixed mode study presenting the lost time injury/disease statistics, perceptions of the stakeholders from survey responses, and from subsequent interviews. The findings indicate a positive cultural change within the industry but an increasing scepticism about online assessment and certification procedures with evidence that some cut corners rather than engage in learning. The final research report from this study has confirmed the *value* this training initiative has for the industry. The *voice* of the discussion now focuses upon how to protect the validity of the training and certification processes.

Key Words: Mandatory training, safety training, construction industry, work-related injury and disease.

INTRODUCTION

While the majority of training and learning prepares people for their future within industry, no training is more vital than that associated with safety. This paper focuses upon the impact of mandatory pre-site safety training in the housing and civil sectors of the construction industry in Western Australia (WA). While a pilot study was conducted in the commercial construction sector in 2010 (Bahn & Barratt-Pugh, 2010), this research extends the study into

the remaining two construction sectors to provide an evaluation of the impact of the training. The University and the Construction Industry Training fund equally funded the study in terms of cash and in-kind support. The paper reports on the data collected from the industry through a broad survey and interviews in early 2011. The evidence from the study has resulted in significant changes to the financial support of the training programme by the Construction Training Fund.

The Western Australian (WA) construction industry developed partnerships aimed at reducing work-related injury and disease by adopting a program of safety awareness training. This was commonly referred to as the 'Green Card' and introduced in 2001. Having embedded this programme within the industry in 2006/07 it was revised and developed to that of competency-based certification, commonly referred to as the 'Blue Card', requiring tri-annual re-certification. However, by 2009 national standards were being generated from the various State initiatives and at that time WA adopted the national Construction Induction Training ('White Card') programme. The training was based upon national competencies and formed part of a training package within the Australian Qualification Training Framework (AQTF) and no longer required regular re-certification. This had the advantage of introducing a transferable national qualification that offered a statement of attainment validating life-long competency for all employees gaining certification. The scheme covers modules about working at heights, in confined places, general lifting, and working with hazardous materials. It should be noted that the Construction Induction Training was not designed to replace company, site specific, or job role inductions, but to be additional in extending the safety training induction and knowledge of each new employee.

The goal of each of these initiatives was to ensure that all construction industry workers would complete a safety awareness course before entering a construction site. Construction sites span the commercial building, domestic housing, and civil engineering sectors of the industry. Each sector presents different working climates and associated hazards. The housing

sector involves many smaller companies with less regulated procedures and multiple trade activity. The commercial sector often involves large projects and the construction of high buildings. The civil sector is associated with very large projects for road and rail development with complex specialist interactions in often remote locations. All the sectors work within a culture of project deadlines and contractor outsourcing. The pre-site Construction Induction Training has been developed to affect a shift in the industry training culture towards mandatory, competency-based, and nationally accredited safety awareness certification. This study focuses upon the impact of these schemes on the stakeholders in the housing and civil construction industry with specific emphasis on the White Card (CIT) initiative since 2006.

While the competencies of the scheme are clearly defined, the Construction Induction Training (CIT) program has been delivered in a variety of modes, in very diverse conditions, and across many different locations. As four years has elapsed since the initial roll out of the programmes, the Construction Training Fund of WA wanted to assess the impact of the scheme. The CIT package was developed by the Construction and Property Services Industry Skills Council (CPSISC) for the National Skills Council and through legislation enacted by Worksafe and became a legislative requirement in WA, with the programme being 80% funded for the industry by the Construction Training Fund. The Fund is built from a levy on all major construction projects valued at more than \$20,000 in WA, and construction companies apply for funding assistance for employees to complete the CIT. This arrangement has funded over 150,000 construction workers completing the CIT and associated courses between 2006 and 2011.

BACKGROUND

The CIT has been built from a research platform that substantiates that safety training interventions lead to an improvement of safety behaviour and a reduction of workplace hazards (Kinn, et al, 2000; Dong, et al 2004; Gillen, et al 2002; Varonen & Mattila, 2000). Unfortunately, while training appears to be associated with work-related injury reduction, the

organisational management of safety in the workplace remains a widely contested arena. This appears to be the case in the construction industry as Biggs, Sheahan & Dingsdag (2006, p.2) indicate that ‘under current legal frameworks, construction companies are required to ensure that people in charge of works are competent to manage OHS obligations; however there is no nationally based or accepted framework that specifically articulates who needs to do which tasks and what competencies they require’. Zanko (2006, p.4) supports this perspective indicating that there is little understanding of what constitutes effective occupational health and safety management and without such a definition there is ambiguity and uncertainty about ‘what to do and what not to do’ in the workplace.

Burke, et al (2011) note that safety-related problems in organisations are often training related or training relevant. They indicate that safety training impacts on the development of safety knowledge and safety performance and that the method of safety training delivery has an effect. They argue that training which engages participants is more effective, producing “greater knowledge acquisition, higher levels of safety performance, and a greater reduction in accidents and injuries” (Burke et al, 2011:48). The importance of ensuring a positive transfer of learning from training to the workplace is underscored by Goldstein and Ford (2002) who argue that this is a critical element in gaining positive changes in work performance. Research evidence suggests that training can have a positive impact on workplace safety but there are few clear guidelines about how such training interventions should be managed and implemented to achieve a lasting workplace benefit for employees and the organisation. What is clear is that training should be designed to achieve high engagement with participants and should also be strongly relevant to workplace activities and management so that transfer between the training culture and the workplace can be seamless.

National pre-site safety training interventions for the construction industry have been trialled in the USA since 1997 when the United States Occupational Safety and Health Administration developed a ten-hour Union-driven hazard-awareness training program (Smart

Mark). Smart Mark is frequently incorporated into apprenticeship training courses and is the most widely used construction safety and health awareness training course in the US (Sokas, et al 2007). An evaluation of the programme by Sokas et al indicated that more than half the work sites improved safety practices after using Smart Mark, by changing their safety policies or by changing work practices. Interestingly, the inclusion of supervisors in the course did not result in any additional benefits. A study in Ohio with plumbers and pipe fitters found that workers who received a site specific safety induction had fewer injuries (Kinn, et al., 2000). Shaikh (2010) studied the impact of safety training on Newfoundland fishermen's knowledge and attitudes toward safety and found that the group moved from a general aversion to support for continual training in safety during the period of the implementation. These studies of the North American experience provide evidence that well targeted training interventions have an impact upon worker practices. However, they also suggest that implementing consolidated and universal programmes across an industry can simultaneously impact upon attitudes to safety or the safety culture within organisations.

MANDATORY TRAINING AND LEARNING

We are born into an organisational society, and as actors within we are subject to rules, guidelines and regulations that are in place to both protect us from our own actions and those of others. As Locke (1971) indicated social governance, and in this case organisational governance, is about achieving balance where individuals conform to certain rules for the greater good, giving up specific freedoms so that a more collaborative goal can be achieved. In this case the greater good is that all employed in construction return home safely every night. However, as we know and as statistics tells us, we are far from achieving this goal as the by-lines at the end of our local news broadcasts continually remind us. Making rules and achieving compliance is a continual management dilemma. As the research indicated, the management of safety in a complex, it is a confusing and contested area where clear guidelines meet the conflict unique to each context. The values and imperatives of

performance confront the values and imperatives of safety. The challenge is significant in the construction industry because of the increasing dimensions of construction sites, the transient nature of the multiply contracted workforces, the increasing mechanisation of practices, the increasing diversity of employees and the pressure to produce at an ever increasing rate. In WA the tyranny of distance and isolation increase the complexity of designing, implementing and managing training and workplace learning. It is therefore understandable that faced with continued work-related injury and disease amounting to a failure to achieve the primary safety goal, the industry and regulators strive to improve. They implement initiatives that increase regulation designed to achieve greater safety results, yet place additional responsibilities on trainers and managers. Workplace incidents are investigated and lessons are learned about specific risks, however it is the lack of compliance over 'normal' working activity that remains the area in most need of improved standards and practices. The challenge for the industry is to design training and learning that can best contribute to a reduction in work-related injury and disease in an ever more complex construction workplace environment.

Here we face the equally complex world of learning theory with more than a century of discipline history and divergent agendas when focusing upon current best practice. Much of our social learning is carried out as a voluntary activity with all the inherent advantages of personal motivation, however issues of health and safety cannot be left to individual choice and they are in the vanguard of those that are often positioned as mandatory learning (NOHSC: 3020, 1994). The inherently dangerous environments of construction sites, despite safety initiatives confront employees with complex and multiple challenges that are very different from their social life outside. Compliance with safety regulation should be positioned as an imperative and given the highest priority. Mandatory programs rather than voluntary learning in this context appear to be offer a more appropriate course. In this case, mandatory learning and regulatory certification must occur *before* a construction worker is allowed onto a construction workplace. However, we are aware that mandatory programmes

often provide an illusion of complete and continued compliance. This is seductive and easily consumed while simultaneously challenging managers and workers who subvert the system to achieve certification without learning. The literature indicated that engagement in training was a prerequisite to effective learning and behaviour transfer to the workplace. To what extent would pre-site mandatory training engage participants and are there variations between the diverse delivery methods?

Mandatory approaches to learning discard the long history of individual learning research that stresses the imperative of personal motivation and contextual relevance in achieving changes of personal knowing and subsequent actions (Knowles, 1990; Kolb, 1984; Lave & Wenger, 1991; Rogers, 1969). However, learning design often privileges institutional control of the selection of learners, the content of learning, the goals of learning, the methods and location of learning and the subsequent certification processes. Such learning patterns position the learner more as the passive recipient than an active one. So in terms of introducing mandatory pre-site safety training for the construction industry, there are several academic questions that remain about such a process and practice. Is such a regulated, often de-contextualised, certificated learning process, with its inherent pedagogic limitations justifiable in terms of safety training? If we can justify a mandatory approach in this context, the processes should be orchestrated to provide learners with ownership, an active role in the process, and relevance. The training should produce an interaction that guides and embeds learning that will endure during subsequent work practices and not merely return short term administrative goals. In short is mandatory learning for compliance compatible with effective learning practices (Noone, 2008)?

While the statistics and questionnaires associated with this study indicate the broad level of acceptance and impact of the scheme, it is the subsequent interview stage that shows the forms of learning that have developed within the mandatory training structure. The challenge for the industry is on the one hand to 'sell' the imperative of pre-site certification and yet

design learning experiences that are not all about compliance. The goal is not certification but ensuring safety behaviour on site. Compulsory learning so often privileges content acquisition and marginalises individual needs. Given the programme is compulsory how can the interaction be designed to be contextually relevant and meet individual needs?

METHODOLOGY

This mixed mode study included the collection of both the perceptions of managers, employees and key stakeholders and recorded work-related injury and disease data. The three key research questions focused on how the CIT had been experienced during the past 3 years in WA:

1. How effective has the Construction Induction Training certification system been for the industry?
2. How effective have the Construction Induction Training practices been for the industry?
3. How has the Construction Induction Training system impacted upon organisations and safety in the industry?

All three research questions were extended in the interviews to probe the issues, benefits and barriers associated with the scheme as well as gathering the perceptions from a range of stakeholders about the value they place on the scheme. The study developed through an action learning approach (Zuber-Skerritt, 2001), collecting data and reviewing the findings collaboratively with a reference group established for the research. Members of the reference group were made up of representatives of Worksafe WA, the Construction Training Fund, the Master Builders Association, the Housing Industry Association, the Australian Workers Union, the Construction Forestry Mining and Energy Union and ECU. This reference group met three times during the project, impacting on the research method, the data collection process and the emerging analysis issues. Table 1 indicates the sample purposively selected for the research project.

Table 1: The Sample

Instrument	Sample frame
Incident Statistics	Tabulation and segmentation of the Housing and Civil Construction sectors records from Worksafe WA for the previous 6 years – Pre and

	during the Construction Induction Training scheme.
Questionnaire	Online distribution to HIA and CCF Memberships of approximately 821 CEOs and supervisors – 6 completed. Mailed survey to HIA and CCF Memberships of approximately 821 CEOs and supervisors - 45 returned completed.
Semi-Structured Interviews	82 interviews with clusters of supervisors, managers, OH&S managers, HR managers and CIT trained tradespeople and employees in both the civil and housing sectors. 53 were conducted as telephone interviews and 29 face-to-face. 33 worked in the Perth metropolitan area and 49 worked in regional WA. 1 telephone interview with a representative from the peak/key bodies: Construction Training Fund, WorkSafe WA, CCF, the CCF Board, MBA, HIA, CFMEU, and an RTO, combined with the 7 interviews conducted and analysed in 2010.

After the project was approved by the ECU ethics committee, the questionnaire was distributed in December 2010 to 821 recipients: CEOs and supervisors in the housing and civil construction sectors addresses supplied by the HIA and CCF databases. The low response rate (5.5%) is an indication that online questionnaires and mailed surveys are not supported by a participant group that is particularly manual in their work practices, not regularly working with computer and perhaps over surveyed. 36.5% of the completed surveys were from companies operating in the commercial sector; 25% in the civil sector and 38.5% in the housing sector. 60% of the completed surveys were from companies operating in the Perth metropolitan area; 31% in regional WA and 5% in remote areas. 58% employed under 20 employees; 29% employed between 20-49 employees; 8% employed 50-199 employees and 5% employed 200+ employees. The low response from the first phase of the data collection failed to yield the numbers of returns the research team anticipated. However, it was sufficient to provide an overall map of the territory and to gain options and access for interviews. A greater emphasis was then placed on the interview process to explore the rationale lying behind the broad survey responses.

In 2011, 82 interviews with clusters of supervisors, managers, OH&S managers, HR managers and CIT trained tradespeople and employees in both the civil and housing sectors. 53 were conducted as telephone interviews and 29 face-to-face. 33 worked in the Perth

metropolitan area and 49 worked in regional WA. This field interviews were carried out in site offices and actually on building sites (with protective clothing!). They were semi-structured and lasted between 10 minutes to more than half an hour depending on the working pressures existing at the time on the sites. Some additional interviews were made by telephone when the majority of the data had been collected with all interviews recorded transcribed

THE STUDY FINDINGS

Incident and fatality statistics

This section begins with an overview provided by the statistical data collection, continues with the broad survey responses and finally focuses on specific issues emerging from the study from the confirmatory interview responses. Australian workers compensation statistics indicate that the construction industry is ranked with the fourth highest incident rate per 1000 employees. The construction industry had the second highest number of fatalities resulting from workplace injury and fatalities resulting from workplace disease between 1997/98-2006/07, and had a worse record than all Australian industries except for mining (Safe Work Australia, 2009).

For our study, Worksafe WA provided the overall construction figures to identify Lost Time Injury and Diseases (LTI/Ds) workers compensation claims for the housing and civil construction sectors as separate entities. Residential building construction is classed as ANZSIC code 4111 (housing) and 4112 (residential buildings under 3 storeys); civil construction (roads and bridges, for example) is classified as ANZSIC code 4121.

The LTI/Ds for the construction industry in WA per 1,000 workers are displayed in table 2. The overall total for one or more days lost time injuries/diseases are decreasing since a peak in 2006-07. Housing construction has shown a steady reduction; however, residential building construction (which includes construction of multiple storey residences up to 3 storeys) and

road and bridge construction (civil construction) have had an increase in 2008-09 and these figures are incomplete (Worksafe WA, 2010). Housing construction completions have reduced in Australia as a consequence of the Global financial crisis. In the civil construction sector and the residential building construction sector there has been a rising trend in the 2008-09 year compared to the previous year and these figures are incomplete. However the numbers for 2007-08 and 2008-09 are less than the 2006-07 where injuries peaked.

Table 2: ANZSIC 1993 Edition codes 4111 House Construction, 4112 Residential Building Construction, and 4121 Road and Bridge Construction: LTI/Ds 1+ days lost

<i>Financial Year</i>	<i>House Construction</i>	<i>Residential Building Construction nec</i>	<i>Road & Bridge Construction</i>	<i>Total</i>
2004-05	172	31	115	318
2005-06	166	34	152	352
2006-07	220	64	177	461
2007-08	211	51	152	414
2008-09p	193	58	159	410
Total	962	238	755	1955
5yr Avg	192.4	47.6	151	391

Source: Worksafe WA, May 2011

Employment grew in Australia between 2003/04 and 2006/07 as did overall incidence of fatalities from injuries sustained while working from 2.6 deaths per 100,000 employees in 2003/04 to 2.8 deaths in 2006/07. Construction fatalities from injuries sustained by working in 2006/07 in Australia are the highest for all industries with 53 of workers dying in 2006/07. In addition the number of non-fatal claims in the construction industry in 2006/07 was 13,965; making construction the third highest industry with injured workers (Safe Work Australia, 2009). This indicates a rising trend in workplace fatalities in the construction industry, although it is not a significant increase given the significant number of new commercial construction projects in WA during this time.

Questionnaire findings

The study questionnaire asked a number of questions relating to the relevance of the training to the industry and the individual to achieve improved safety awareness. Table 3 illustrates the responses to the statement that the CIT provided a good first step to developing safety awareness for their staff. One third of the respondents strongly agreed, nearly half agreed, and

12% were undecided. However, 6% disagreed with 4% strongly disagreeing with the statement.

Table 3: CIT is a good first step

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	2	4.0	4.1	4.1
	D	3	6.0	6.1	10.2
	N	6	12.0	12.2	22.4
	A	22	44.0	44.9	67.3
	SA	16	32.0	32.7	100.0
Total		49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

The respondents were asked whether they believed that the CIT provided benefit to their staff. The majority agreed with this statement and 16% strongly agreed. One in five were undecided. However 8% respondents disagreed and 4% strongly disagreed (Table 4).

Table 4: Benefit to staff

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	2	4.0	4.1	4.1
	D	4	8.0	8.2	12.2
	N	9	18.0	18.4	30.6
	A	26	52.0	53.1	83.7
	SA	8	16.0	16.3	100.0
Total		49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

The respondents were asked if they perceived that after their staff completed the CIT there was a measurable benefit to their business. About half of the participants agreed or strongly agreeing with 30% undecided. However, one in five of those surveyed report no measurable benefit to their business by completion of the CIT by their employees (Table 5).

Table 5: Measurable benefit to business

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	4	8.0	8.2	8.2
	D	9	18.0	18.4	26.5
	N	13	26.0	26.5	53.1
	A	17	34.0	34.7	87.8
	SA	6	12.0	12.2	100.0

Total	49	98.0	100.0
Missing System	1	2.0	
Total	50	100.0	

Nearly half of respondents believe that the CIT assisted their business by reducing accident/incident rates. 55% of respondents did not (table 6).

Table 6: CIT reduced accident/incident rate

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	22	44.0	45.8	45.8
No	26	52.0	54.2	100.0
Total	48	96.0	100.0	
Missing System	2	4.0		
Total	50	100.0		

In summary, the sample indicated in general that the training was valued as a first step in safety awareness for the industry. Figure 1 shows that 9 out of ten participants in the sample accept that the cost of the training is minimal with assistance of the CTF. Nearly all of the sample agree that trainers should have industry experience, and also believe they should have a formal qualification, with all respondents valuing training for accreditations and industry compliance. Four out of every five participants believed the CIT is ‘a good first step’ to safety awareness for the industry. The same number of participants stated there was adequate time spent by trainers delivering the course. Similarly, most believed the CIT provided benefit to their staff. Half of the managers believed that by having their staff complete the training there was a measurable benefit to their business. Nearly half stated that the training assisted their business by reducing accident rates; however 55% of the sample disagreed with this statement providing a polarised response. Perhaps most significantly in contrast to the positive comments about the CIT and industry effectiveness, there were several negative comments about the online training delivery mode, although 36% of the sample looked for this type of delivery when they chose a training provider.

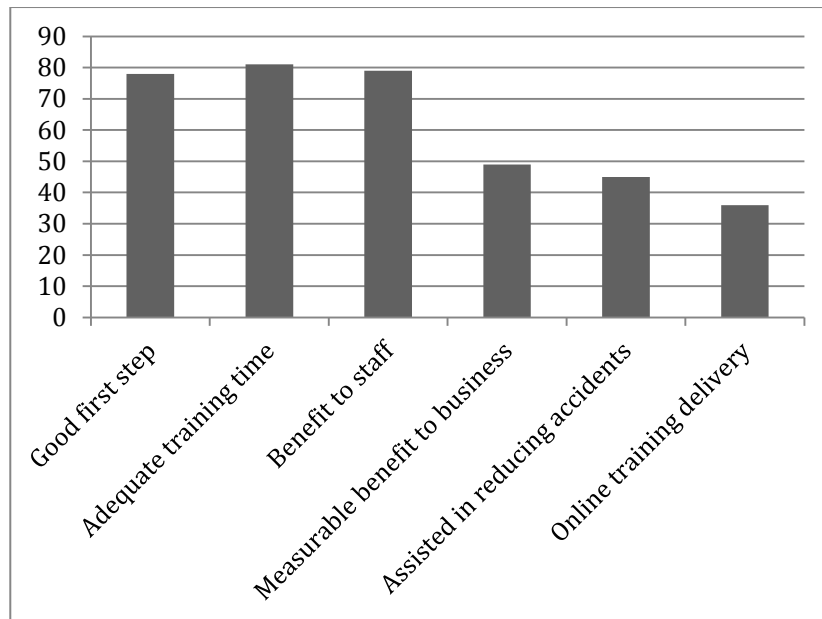


Figure 1: Percentage of sample who reported benefits of the CIT

Confirmation from the interview phase

The interview stage of the study included 82 interviews conducted with managers in the industry, employees and peak bodies associated with the training infrastructure. The interview responses were congruent with the broad questionnaire findings providing deeper evidence of how the CIT is perceived and what forms are the most successful in learning terms for the industry participants. While the data has produced several issues of interest for the industry, in terms of our training focus for this paper we have concentrated on the mode of training delivery.

Participants were asked to identify advantages of completing the CIT in the face-to-face classroom mode. Many commented on the ability to gain a thorough understanding of the content through the ability to question the instructor during classroom training.

Face-to-face is better because at least you can ask questions (TRADESMAN).

I thought it was something that we could all do together. I think safety is very important and I just wanted us in a group to do the course together in case somebody had questions or something like that just to sort of add to it a bit because I think it's okay to go online and complete some questions on the safety but I think it's a lot better if we

can sit around in a room. You get a lot more from it and talk about it (HOUSING MANAGER).

Participants, when discussing the face-to-face mode of delivery, identified some disadvantages. These included the mundane delivery of the content and the time taken to complete the training.

I have to admit when I personally sat my Blue Card and that was through a face-to-face um course it was probably the most painful and boring four hours of my life (CIVIL MANAGER).

We choose face-to-face as a preference but can be time consuming (HOUSING MANAGER).

The online delivery mode for the CIT was initially made available because a number of WA workers were located in remote areas and there was limited access to training centres for face-to-face delivery. Participants identified several advantages of completing the training in online mode, including the shorter completion time and being able to complete the training before starting to work in the industry. They also felt that being able to complete the training in their own time without losing time on the job or having to travel to a training centre was an advantage.

Most people can get it without too much effort and they would rather them sitting at the computer from anything from half an hour to an hour and a half in not on their own time (PEAK).

I think they welcome it given that they don't have a training culture it's easier, quicker and doesn't require time off their job (PEAK).

It was convenient because it was at home. I couldn't get to the place where they were holding it (TRADESMAN).

I have seen some people do the online training now and it definitely streamlines and fast-tracks the program because so many of the questions are so common sense that without having to sit through a tutorial first you can answer a lot of the questions (CIVIL MANAGER).

Although convenience was a major factor in the preference for online training, participants also acknowledged some of the limitations, including the integrity of the training because it can be attained with relative ease. There were also concerns about whether the content of the course is retained in the site environment and over time.

I think they prefer the way it's delivered but they don't necessarily have respect or

appreciate the final outcome as much as if they'd had to sit in a classroom for a whole day, as they would previously (PEAK).

I quite often say hey you've got your White Card you should know what you're doing. They actually probably don't know what you're talking about because they've done it on the Internet (HOUSING MANAGER).

They don't really have to demonstrate that they fully understand what they're been taught when you do it online (HOUSING MANAGER).

While the flexibility of the online options was highly regarded by some, there was significant comment that online completion and assessment was seen as eroding the validity of the certification scheme. While some respondents indicated that online course availability was a benefit, the majority of respondents expressed comments about online completion being the easy and quick option that undermined the value of the face to face course certification. Several regional and rural contractors, for whom the online option had been introduced, preferred to organise face-to-face training to ensure quality. In addition, some organisations refused to accept online certification and insisted that those employees with such certificates re-attended face to face training sessions for re-certification. The evidence indicated universal acceptance and use of the scheme that was seen as contributing to a significant cultural shift towards safer working practices. However, our final report noted that 'Some participants questioned the quality of the online delivery and particularly the assessment.'

Recommendations were work-shopped with the reference group and while they indicated the general success of the scheme they also indicated that:

'(The industry) Continue to offer the CIT in both face-to-face and online modes but develop more stringent assessment and course completion strategies for online delivery.'

In January 2012 the Construction Training Fund board met and decided to remove the subsidy given to online delivery and look for ways to improve the individual verification for certification given by this mode of training.

CONCLUSION

1. How effective has the Construction Induction Training certification system been for the industry?
2. How effective have the Construction Induction Training practices been for the industry?
3. How has the Construction Induction Training system impacted upon organisations and safety in the industry?

The statistics indicate that work-related fatalities and injuries are on the rise in the housing and civil construction industries in WA but this is of little surprise to anyone who has seen the skyline of cranes in central Perth. There is a major construction boom underway, and a significant increase in construction projects requires an increase in the workforce, often through rapid training or importation. We should therefore expect some rise in work-related injury and disease within the industry, but the evidence of this study indicates that the incident rate relative to the increased workforce has decreased during the period. This study can provide no hard evidence of the extent to which the CIT is responsible for decreasing LTI/Ds, but there is evidence that the introduction of *mandatory pre-site safety training* has gained broad acceptance within the industry and is seen as one of the initiatives that has improved the safety culture. In responding to the research questions the study evidence indicates that the initiative has been effective in changing cultural patterns by placing safety training 'first' before site entry. The training practices are broadly accepted and managers believe that they have had a positive impact on safety within the industry with this supported by statistics. While providing broadly positive evidence about the impact of the training scheme on the industry this study also reported more negative reactions to the use of on-line delivery mechanism. While this mode was brought in to support training in rural and remote companies and workers the evidence suggest that this option has sometimes been chosen to short circuit the time and rigor of the face to face mode and in some cases to gain certification without engaging with the appropriate learning process. This paper questioned whether mandatory learning for compliance was compatible with effective learning practices. The answer appears to be affirmative in this context, but with evidence suggesting that online modes of delivery may be less effective for the industry as a whole. The industry has reacted

to the findings of our recent report with continued funding for the scheme, increased collaboration between the stakeholders involved, but also with reservations about the online training option. The Board of the CTF are assessing how changing the funding for the training options may increase the impact of training expenditure in the industry and have withdrawn support for the online options to improve the validity of the certification. Preventing individuals and organisations cutting corners is a primarily governance issue, critical for industrial safety, but also critical to ensure the integrity of our national training and learning frameworks. In this case *the value of this VET research* may have been to support the value of training integrity.

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