

# *Safety coaching: a literature review of coaching in high hazard industries*

Article

Accepted Version

Passmore, J. ORCID: <https://orcid.org/0000-0003-0832-7510>, Krauesslar, V. and Avery, R. (2015) Safety coaching: a literature review of coaching in high hazard industries. *Industrial and Commercial Training*, 47 (4). pp. 195-200. ISSN 0019-7858 doi: 10.1108/ICT-12-2014-0080 Available at <https://centaur.reading.ac.uk/81938/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

To link to this article DOI: <http://dx.doi.org/10.1108/ICT-12-2014-0080>

Publisher: Emerald

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

[www.reading.ac.uk/centaur](http://www.reading.ac.uk/centaur)

**CentAUR**

Central Archive at the University of Reading

Reading's research outputs online

## **Safety Coaching: A brief literature review**

Passmore, J. Krauesslar, V. & Avery, R.

### **Abstract**

**Purpose** – The purpose of this paper is to critically review the research literature on safety coaching, with a particularly focus towards work in safety critical environments such as oil and gas, manufacturing and driving.

**Design/methodology/approach** – A literature review was undertaken of existing research to assess whether safety coaching could be applied in the offshore oil and gas industry.

**Findings** – The paper suggests that coaching may offer some potential in helping support learning, behavior change and is consistent with feedback and development approaches used in behavioural-based safety.

**Research limitations/implications** – Further research would be needed to test the value of coaching to this new environment.

**Practical implications** – The paper informs practice on the development of coach training for safety coaching offshore.

**Originality/value** – The paper offers a new understanding of the potential of safety coaching in a new area of practice.

## Introduction

The benefit of coaching interventions in facilitating effective and long lasting behavioural change has been well evidenced. Grant et al. conducted a detailed literature review and concluded that coaching research offered significant empirical evidence that coaching was a valid organisational intervention (Grant et al 2010). Further, more recent meta-analysis papers (Theeboom et al., 2014 & Jones et al., 2014) have confirmed that coaching is a useful organisational intervention, with comparable effect sizes to other interventions including training and appraisals. However, there has been less research to review the application of coaching explicitly in safety critical environments, specifically in the oil and gas industry, which has started to make extensive use of the intervention in the past four years. This short paper critically reviews the research literature in safety critical environments.

## Coaching in Safety Critical Environments

Many researchers have noted that many workplace accidents are foreseeable and preventable; the result of a build-up of small mistakes and seemingly unimportant incidents that together can create disaster (Pate-Cornell 1993). Although the link between coaching and behavioural change has been investigated in an organisational context the classification of safety coaching specifically is not well defined and safety coaching in high risk environments is a very under researched area. The link between the implementation of safety coaching programs and improved workplace safety records has not been fully demonstrated.

Safety coaching can be defined as:

*‘an applied behaviour analysis technique that involves interpersonal interaction to understand and manipulate environmental conditions that are directing (i.e., antecedent to) and motivating (i.e. consequences of) safety related behaviour’ (Wiegand 2007:391).*

Behavioural-based safety coaching can be defined as a process of observation and feedback in order to support safe behaviours and provide constructive feedback on risky behaviours in the workplace (Geller, Perdue and French 2004). As Geller et al. (2004) report, behavioural based safety coaching was implemented by a large construction firm who experienced very positive results including a significant reduction in reported injuries and greater collaboration and care between employees increasing safe working behaviours and problem solving.

Given this and our own extensive experience in coaching generally and more recently in applying these insights to other safety critical sectors, we propose a revised definition:

*“ a Socratic based, future focused dialogue between one individual (safety coach) and a another individual (worker), where the lead individual uses open questions, affirmations, summarises and reflections informed by observation and evidence,*

*aimed at stimulating the self-awareness and personal responsibility of the second individual, with the specific goal of improving safety.”*

Although improvements in tools and systems have produced considerable improvements in safety, this effect has decelerated meaning that other subtler factors such as attitudes, behaviours and perceptions of risk also impact significantly on producing safe working behaviours (Step Change In Safety, 2013). This is where safety coaching comes in to play, engaging people with safety, setting expectations and creating a sense of responsibility and accountability. As Geller (2011) points out, it is important for workers to feel empowered and invested in occupational safety. This is not simply achieved through the correct tools and training but by a personal motivation and investment in the value of carrying out your work safely and promoting safety within the organisation. The critical need to make safety relatable and affecting to people, highlighting the *‘emotional aspects of personal injury’* (Geller 2011:43), as well as promoting care and empathy within an organisation are also key aspects of continuing to move safety forward and see further reductions in unsafe working practices. Safety coaching can help to achieve this by promoting the central values of empowerment, emotion and empathy (Geller 2011).

The importance of these subtler behavioural motivators were evidenced by Newnam, Griffin and Mason (2008), who discovered through self-report surveys using exploratory factor analysis that drivers’ safety motivation predicted incidents of crashes. Drivers’ perceptions of their fleet manager’s safety commitment and values also predicted their motivation to engage in safe driving behaviours, as well as their personal attitudes and beliefs. As Mathis (2009) reports from a safety culture assessment, managers’ don’t always recognise the effect of low safety performance on the company as a whole and may be detached from the day-to-day safety issues. Supervisory coaching was therefore implemented in order to communicate the organisations commitment to safety in order to create a sustainable and consistent culture where safety is valued. Mathis (2009) offer a three stages model. In the focus stage supervisors analyse past accident data and then formulate safety targets to focus on. In the feedback stage supervisors develop their skills in delivering feedback to employees. There is also then a facilitation stage. This is the basic observatory; feedback and review structure that safety coaching entails. The current research will assess more in depth how this process works in practice, what specific tools and structures are employed by safety coaches and most importantly the perceived results and outcomes of using safety coaching.

Social maladjustment and distractibility measures were found to be significant contributory factors of *accidents* (Hansen 1989), *showing* how implicit personality traits can impact on behaviour as well as obvious external factors such as processes or equipment. Christian, Bradley, Wallace and Burke (2009) also established that safety motivation and awareness were overwhelmingly linked to safety behaviours. Psychological safety climate and group safety climate were also found to be important elements in influencing safety behaviours, with group safety climate strongly linking to accident and injury rates. The importance of workers’ perceived management commitment to safety was highlighted by O’ Dea and Flin (2001), with managers’ experience not being the overwhelming factor in determining their attitudes to safety and consequently their style of leadership. O’ Dea and Flin (2001) explain the problems faced in the oil and gas industry, with managers not always acting consistently in line with well-

known safety best practice due to the challenges they face in communicating ownership and responsibility of safety to workers. This may be one area where safety coaching can make a contribution.

Safety coaching involves the use of observation and feedback and has been shown to reduce error rates in safety critical occupational settings such as a radiology hospital department (Dickerson, Koch, Adams et al 2010). Safety performance and safety culture was assessed before the coaching intervention and two years after. Safety performance improved dramatically with the mean number of days between serious safety events increasing from 200 to 1,031 with no reported incidents. Safety culture (as measured through a safety survey) also significantly improved, as did response rates, indicating an improved engagement with safety. Compared to other hospital departments that did not receive coaching interventions radiology was shown to have a significantly more prominent safety culture. Alamgir, et al (2011) found that a peer coaching intervention helped to facilitate safe patient handling in a health care setting, with staff reporting increased safety consciousness and confidence in using the patient lifting equipment. This is promising in light of the current research purpose because it shows that coaching can be used to facilitate safe working behavioural practices and to really promote an awareness of safety issues.

Coaching interventions have been found to increase various outcomes including skills and attitudes (Stanton, Walker, Young and Salmon, 2007) and that these attitudes are specifically affected by more proximal impacts such as perceived management obligation to safety (Mearns and Yule 2009).

An enforcement approach to safety was compared to a behavioural-based safety method (Geller, 2011). Geller concluded that behavioural-based safety can help to decrease the rate of errors, injuries and deaths in care and industrial environments by engaging workers in hazard and unsafe behaviour identification and in creating interventions to encourage safe behaviours and reduce hazard occurrence.

Burke, Crowe, Salvador and Chan-Serafin (2011) conducted a meta-analysis to investigate the links between safety training and safety knowledge and outcome. It was found that safety training that was more appealing and interactive was more successful when the potential risk was high compared to training that was low in engagement and when the potential risk was lower. This is important as it shows that the highly engaging training was most effective. This consisted of '*behavioural modelling, simulation, and hands-on training*' (Burke et al 2011: 50) that mirrors the engaging, focused style of coaching. This suggests that coaching may play an important role in increasing safety knowledge and positive safety training outcomes.

Coaching was shown to facilitate safety observations and perceptions in metal industry organisations, measured through the use of a safety perception questionnaire, interviews and a safety observation index (Kines, Andersen, Andersen, Nielsen and Pedersen, 2013). The coaching intervention implemented by the authors involved manager coaching sessions as well as manager and employee communication meetings over the period of 26 weeks. Following the coaching intervention there was a significant increase in the number of safety needs identified and resolved and the level of safety perception also improved dramatically. Anderson et al. (2007) conclude that the implementation of safety coaching

can lead to behavioural change and has the potential to start the process of adapting and improving the safety culture that exists. Research also points to the potential long-term benefits that safety coaching can provide (Kines, Andersen, Spangenberg, Mikkelsen, Dyreborg and Zohar 2010). Two intervention groups of construction site foreman were coached to engage in on-site safety communication with employees. Safety conversations increased dramatically (with a 7.1 factor increase found in one of the intervention groups), site safety level improved (impressively an 84% observed safety level increase in 'railings and coverings') as well as improved safety climate perceptions (improved perceived focus on safety).

This research shows how a high-risk working environment such as the construction industry can improve safety outcomes by using safety coaching to improve safety communication between site managers and employees. Similarly, oil and gas industry may therefore receive similar safety level improvements through the use of safety coaching to promote changes in safety culture. The lasting impact of behaviour grounded safety initiatives (BBS) was demonstrated by Al-Hemound and Al-Asfoor (2006) who introduced the BBS safety intervention for 11 employees in a department of a research institution. It was discovered that safety performance index increased between the baseline and intervention parts of the research for the experimental group; however it remained relatively unchanged for the control group. Safety performance level for specified safety behaviour variables (such as storing and stacking, sitting posture, smoking) increased from a baseline 74% to 100% at the end of the six weeks for the experimental safety intervention group. Employees continued to be observed for their level of safety performance for three months, and the increases in the experimental group were shown to be maintained when the 6 week intervention concluded, suggesting that behaviour based safety interventions can produce a lasting impact on safety level performance. Zhang and Fang (2012) also argue that a behaviour-focused safety system can help to achieve long-term improvements in safety standards. They argue that a behaviour-based safety approach (BBS), combined with a behaviour-based tracking and analysis system (BBTAS) can achieve a more cohesive safety system at site and management and lead safety standards to be continually driven and improved over time as opposed to a short intervention that only achieves short term benefits.

Wiegand (2007) points to the importance of emotional intelligence in safety coaching. Emotional Intelligence is considered to involve the ability to perceive, evaluate and demonstrate emotion successfully (Wiegand, 2007). According to Wiegand (2007), emotional intelligence is important in safety coaching as it allows the safety coach to recognize their own emotions and allow any interpretations and feedback to be objective. Emotional intelligence also allows the coach to understand how the coaching process is being received by the participant and thus adjust their style. Wiegand (2007) also report that the safety coach must be able to engage in appropriate emotional presentation (such as the expression of confidence and trust in order for the coaching to be valued by the participant. Swuste and Arnoldy (2003) also argue that a safety leader's qualities of being able to reach out, connect, encourage and engage with employees is as central to an organisation as its standard of safety structure in place. Given this research on the key role that emotional intelligence plays in safety coaching, it is expected that it will emerge as an important aspect of the current research.

More recently work in the safety environment of driver development in the British Army has shown that coaching can be used as an effective learning methodology (Passmore & Rehman, 2012). The research studies used a randomised control trial methodology to explore the application of coaching compared with instruction as approaches to learning. The results indicated that a blended approach of coaching and instruction was more efficient and more effective than instruction alone. The blended approach resulted in few learning hours be used to achieve the learning outcome, and participants in the blended approach group achieved a higher pass rate in the assessment than the members of the instruction group. The results suggests that where behavioural learning or adaption is required coaching, combined with instruction, is more effective than using instruction methods alone.

In a parallel qualitative study into advanced police driver training (Passmore & Townsend, 2011) which reported the perceived value of coaching was in encouraging reflection and in providing an individualised learner as opposed to an instructor based approach to learning.

There is however huge variability in safety systems and climates that are affected by many factors. Wu, Lin and Shiau (2010) investigated the factors that influence an organisation's culture of safety, discovering that the greatest predictor of overall safety culture was advice from operations managers. Employees' safety concern levels and safety synchronization and direction by all safety advisers were also found to be influential to overall safety culture. National safety culture was actually found by Mearns and Yule (2009) to be less critical to employees' perceptions on safety compared to the safety climate that existed within the organisation (such as perceived management dedication to safety and perceived effectiveness of safety strategies). This suggests that specific organisational based safety interventions focused on the organisation's safety climate could be effective in helping to create a safe working environment. The far reaching effects of coaching within the oil and gas industry to produce a complete cultural shift was demonstrated by Renning (2007), who implemented a coaching program that revolved around being present, visible and accountable for safe working behaviours. As Renning (2007) points out the central theme that teams need to work together and unite in creating a safe working environment strongly resembles the 'human factor' initiatives introduced in the airline industry in the 1990's.

## **Conclusion**

The evidence suggests that coaching has developed an evidence base that supports the claim that coaching is an organisational effectiveness. Further, there is evidence that coaching may be an effective intervention to improve safety outcomes in some safety critical environments, particularly when used as part of a wider approach to safety.

## References

- Alamgir, H., Drebit, S., Guiyun, H., Kidd, C., Tam, H., & Fast, C. (2011). Peer Coaching and Mentoring: A New Model of Educational Intervention for Safe Patient Handling in Health Care. *American Journal of Industrial Medicine*, 54, 609-617.
- Al-Hemoud, A., & Al-Asfoor, M. (2006). A behaviour based safety approach at a Kuwait research institution. *Journal of Safety Research*, 37, 201-206.
- Andersen L.P., Kines, P., & Hasle, P. (2007). Owner attitudes and self reported behavior towards modified work after occupational injury absence in small enterprises: a qualitative study. *Journal of Occupational Rehabilitation*.17(1):107-21.
- Burke, M., Smith-Crowe, K., Salvador, R. & Chan-Serafin, S. (2011). The Dread Factor: How Hazards and Safety Training Influence Learning and Performance. *Journal of Applied Psychology*, 96, (1), 46-70.
- Dickerson J.M., Koch B.L., & Adams J.M., (2010). Safety coaches in radiology: decreasing human error and minimizing patient harm. *Pediatric Radiology*. 40:1545-1551.
- Christian, M.,Bradley, J., Wallace, J. and Burke, M. (2009). Workplace safety: a meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*. 94(5): 1103-27.
- Geller, E. (2011). Psychological Science and Safety: Large-Scale Success at Preventing Occupational Injuries and Fatalities. *Association of Psychological Science*, 20, 109-114.
- Geller, E., Perdue, S., & French, A. (2004). Behavior-Based Safety Coaching 10 guidelines for successful application. *Professional Safety*, 42-49.
- Grant, A., Passmore, J., Cavanagh, M., & Parker, H. (2010). The state of play in coaching. *International Review of Industrial & Organizational Psychology*, 25, 125-168.
- Hansen, C. P. (1989). A causal model of the relationship among accidents, biodata, personality, and cognitive factors. *Journal of Applied Psychology*, 74, 81-90.
- Jones, R. Woods, S., & Guillaume, Y. (2014). *A Meta-Analysis of the Effectiveness of Executive Coaching at Improving Work-Based Performance and Moderators of Coaching Effectiveness*. Paper Presented to BPS DOP Conference January 2014.
- Kines, P., Andersen, D., Andersen, L., Nielsen, K., & Pedersen, L. (2013). Improving safety in small enterprises through an integrated safety management intervention. *Journal of Safety Research*. 44: 87-95.
- Kines, P., Andersen, L. P., Spangenberg, S., Mikkelsen, K. L., Dyreborg, J., Zohar D. (2010). Improving construction site safety through leader-based verbal safety
- Passmore, J. Krauesslar, V. & Avery, R. (2015) Safety Coaching: A critical literature review. *Industrial & Commercial Training*. 47(4), 195-200.

communication. *Journal of Safety Res.* 2010 Oct;41(5):399-406.

Mathis, T. (2009). *Supervisory Safety Coaching: Growing a Safety Culture from the Middle Out*. EHSToday, 20-22. Retrieved from: <http://ehstoday.com/safety/supervisory-safety-coaching-culture-5634>.

Mearns, K., & Yule, S. (2009). The role of national culture in determining safety performance: Challenges for the global oil and gas industry. *Safety Science*, 47, 777-785.

Newnam, S., Griffin, M & Mason, C. (2008). Safety in Work Vehicles: A Multilevel Study Linking Safety Values and Individual Predictors to Work-Related Driving Crashes. *Journal of Applied Psychology*, 9, (3), 632-644.

O'Dea, A., & Flin, R. (2001). Site managers and safety leadership in the offshore oil and gas industry. *Safety Science*, 37, 39-57.

Passmore, J., & Rehman, H. (2012). Coaching as a learning methodology – a mixed methods study in driver development – a Randomized Controlled Trial and thematic analysis. *International Journal of Coaching Psychology Review*, 1-29.

Passmore, J., & Townsend, C. (2011). The role of coaching in police driver training – An IPA study of coaching in a blue light environment. *An International Journal of Police Strategies*, 1-21.

Pate-Cornell, E. (1993). Learning from the Piper Alpha Accident: A Post-mortem Analysis of Technical and Organizational Factors. *Risk Analysis*, 13, (2), 215-232.

Renning, S. (2007). Innovative coaching program enhances safety culture. *Offshore*, 80-81.

Stanton, N., Walker, G., Young, M., Kazi, T., & Salmon, P. (2007). Changing drivers' minds: the evaluation of an advanced driver coaching system. *Ergonomics*, 50, (8), 1209-1234.

Step Change In Safety (2013). Coaching For Safety Guidelines. Retrieved from: <http://www.stepchangeinsafety.net/knowledgecentre/publications/publicationid/17> on 7 February 2014.

Swuste, P., & Arnoldy, F. (2003). The safety adviser/manager as agent of organisational change: a new challenge to expert training. *Safety Science*, 41, 15-27.

Theeboom, T., Beersma, B., & van Vianen, A. E. (2014). Does coaching work? A meta-analysis on the effects of coaching on individual level outcomes in an organizational context. *The Journal of Positive Psychology*, 9(1), 1-18.

Wiegand, D. (2007). Exploring the role of emotional intelligence in behaviour-based safety coaching. *Journal of Safety Research*, 38, 391-398.

Wu, T. (2008). Safety leadership in the teaching laboratories of electrical and electronic engineering departments of Taiwanese Universities. *Journal of Safety Research*, 39, 599-607.

Zhang, M., & Fang, D. (2012). A continuous Behaviour-Based Safety strategy for persistent safety improvement in construction industry. *Automation in Construction*, *In Press*, 1-7.